*	
---	--

1.	Transport Canada Publication No.	2. Project No.		3. Recipient's C	Catalogue No.			
	TP 15321E							
4.	Title and Subtitle			5. Publication [Date			
	Aircraft Ground De/Anti-Icing Fluid Holdover Time Development Program for the 2014-15 Winter							
				_	6. Performing Organization Document No.			
				CM226	5.004			
7.	Author(s)			8. Transport Canada File No.				
	Stephanie Bendickson							
9.	Performing Organization Name and Address			10. PWGSC File	10. PWGSC File No.			
	APS Aviation Inc. 6700 Cote-de-Liesse, Suite 105				11 DWCSC or Transport Capada Contract No.			
	Montreal, Quebec H4T 2B5			11. PWGSC of I	11. PWGSC or Transport Canada Contract No.			
	Canada							
12.	2. Sponsoring Agency Name and Address			13. Type of Publ	13. Type of Publication and Period Covered			
	Transportation Development Centre Transport Canada				Draft			
	330 Sparks St., 26th Floor			14. Project Office	er			
	Ottawa, Ontario K1A 0N5 Canada			Antoine	Antoine Lacroix			
15.	Supplementary Notes (Funding programs, titles of related put	plications, 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 2014-15 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 frost, 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 780 tests were conducted with seven fluids.							
	Changes to the holdover time guidelines for the winter of 2015-16 include:							
	 Fluid-specific HOT guidelines were added for three new fluids: Kilfrost ABC-Ice Clear II (Type II), Newave Aerochemical FCY-2 Bio+ (Type II) and Deicing Solutions ECO-SHIELD (Type IV); 							
	 Increases were made to snow holdover times for two fluids for which supplemental testing was conducted: LNT Solutions P250 (Type II) and LNT Solutions E450 (Type IV); 							
	• Three fluids were removed from the guidelines as per the protocol for removal of obsolete data: Clariant Safewing MP II 1951 (Type II), ABAX AD-480 (Type IV) and Kilfrost ABC-S (Type IV);							
	• Six minor changes (increases and decreases of up to 5 minutes) were made to the Type II generic HOT guidelines as a result of the new and removed fluids;							
	• Significant changes (primarily increases) were made to the Type IV generic HOT guidelines as a result of the new and removed fluids;							
	 Fluid, application temperature, rotation speed-specific HOT guidelines were added for Type III fluids, specifically Clariant Safewing MP III 2031 ECO (applied heated) and AllClear AeroClear MAX (applied unheated); and 							
	• The Type III generic HOT guidelines were removed due to the different application temperature requirements of the two Type III fluids.							
	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 if a new Type III fluid is submitted for heated application testing, further research be conducted to evaluate endurance times of Type III fluids applied heated to composite surfaces. Finally, it is recommended that further research be completed to evaluate the current holdover times provided for Type II, III and IV fluids in snow at very cold temperatures.							
17.	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							
19.	Security Classification (of this publication)	20. Security Classification (of	this page)	21. Declassification (date)	22. No. of Pages	23. Price		
	Unclassified	Unclassified			xvi, 90 app.	—		

