Aircraft Ground Icing Exploratory Research for the 2002-03 Winter

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Effects of fluid coverage

The adherence of Type I fluids on test surfaces is crucial for protection from contamination. APS Aviation has been asked to investigate the effectiveness of Type I fluid coverage. Experimental work was conducted with different Type I fluids and test surface combinations. Tests were conducted on plates and also run on a Canadair RJ Wing. The limited test results showed that the coverage effectiveness depends significantly on the surface roughness. Adherence was less effective with propylene-based Type I fluids.

Taxiing effects on holdover time

Operational data were collected to examine the nature of aircraft exposure to wind and snow during the departure phase of operations when holdover times apply. The analysis distributed expenditure of holdover times among the various stages of a routine departure during deicing operations. For the departure runway studied, it was shown that the combination of taxi-way orientation, speed of taxiing, and direction and speed of wind did not cause non-symmetrical exposure to wind, and thus to snow-catch. A pilot survey produced suggestions for improving the effectiveness of HOT utilization.

Surface temperature profiles: day versus night

The objective of this study was to examine whether there is a differential in the temperature of an anti-iced surface versus air temperature during typical snow conditions and whether that differential is different during the day as opposed to night. Due to the limited number of tests, a conclusion cannot be made at this time.