

John Reinhardt
FAA

Ducting Abstract:

A comprehensive fire test program was conducted on aircraft ducting materials in an effort to continue mitigating the threat of in-flight fires. Previous work at the Federal Aviation Administration (FAA) William J. Hughes Technical Center has indicated that the current FAA vertical Bunsen burner test requirement could not adequately discriminate between materials that performed poorly and materials that performed well under realistic fire scenarios. From this effort, an alternative radiant heat panel test method was developed. It was demonstrated that this method was effective in evaluating the in-flight fire resistance qualities of aircraft ducting.

Wiring Abstract:

The Federal Aviation Administration (FAA), as part of its hidden in-flight fire mitigation program, developed an improved flammability test method for aircraft electrical wiring insulation materials (including jackets and other wire protective materials). A comprehensive fire test research and development (R&D) project was conducted on aircraft electrical wiring insulation materials in an effort to continue mitigating the threat of in-flight fires. Previous work at the FAA and the National Fire Protection Association have indicated that the current FAA-required 60-degree Bunsen burner test for electric wire was inadequate to qualify wire when bundled and subjected to a severe ignition source. A literature search and in-house fire tests were conducted during this effort. The results of the literature search indicated that there was no small-scale flammability test standard available that considered radiant heat and wire bundling in its specifications or acceptance criteria that included burn length and after-flame extinguishing time; therefore, an improved flammability test standard for aircraft wiring was required. In-house fire tests were conducted to develop an improved flammability test and provide support data; tests included the current FAA-required 60-degree Bunsen burner test, the microscale combustion calorimetry test (ASTM D 7309-07), the thermogravimetric analysis (ASTM E 2550-07), the intermediate-scale fire test, and the radiant heat panel test. From this R&D effort, an alternative radiant heat panel test method was developed. This method was effective in evaluating the in-flight fire resistance qualities of aircraft electrical wiring insulation.