

SMALL SCALE FIRE TEST FOR COMPONENT SUBSTITUTIONS IN AIRCRAFT CABIN MATERIALS

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ABSTRACT

A physically based microscale combustion parameter for early stage fire growth, called the fire growth capacity/*FGC* (J/g-K), is derived from flame-spread theory and calibrated against full-scale fire tests in aircraft cabins. The *FGC* includes ignitability and heat release of the material in a single parameter that can be measured in a microscale combustion calorimeter/MCC using the standard ASTM D 7309 method. The *FGC* measured in the MCC successfully ranks commercial materials according to their expected behavior in bench scale flame (UL 94 V) and fire (14 CFR 25) tests, and for this reason is being evaluated by an industry/Federal Aviation Administration (FAA) working group as an alternate means of complying with 14 CFR 25 fire performance requirements of cabin materials in transport category aircraft when a component of a certified cabin material must be changed due to unavailability or environmental concerns.