Advanced Composite Materials Fire Fighting

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Abstract. For the first time, commercial passenger aircraft are entering service using advanced composite materials for the structure of the passenger compartment instead of a traditional aluminum structures. Both Airbus and Boeing have introduced and have secured orders for carbon fiber composite passenger aircraft. Boeing is currently flight testing their version and is close to their first delivery. Airbus is currently using a fiber metal laminate composite in their A380 double deck aircraft, which is in service in several markets around the world, including the United States. Airport fire service requirements for extinguishing agent quantities are based on experience, scientific testing, and actual accident data review, but the adequacy of those requirements has not been evaluated for advanced composite aircraft.

This presentation will discuss and present findings from an ongoing study that is assessing the quantity of water needed by the fire department to extinguish any flaming or smoldering of the composite material and cool the material below a temperature that could cause re-ignition or ignite adjacent materials or fuels. Testing of materials is being conducted in two phases; the first to assess if the material exhibits any flaming, smoldering, or re-ignition after being exposed to the FAA NextGen burner for specific time intervals. The second phase exposes a larger sample to a propane fired area burner that can recreate the conditions found during phase one testing and remotely apply agent.