Abstract for Fire Research Sessions - 9th International Aircraft Fire and Cabin Safety Research Conference:

Session: **Fire Research II – Characterization and Testing**

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Abstract:

Textiles are typically found inside aircraft in the forms of seat coverings and curtains, but may additionally be found in some specialized interior components, such as 1st class seating accents or private jets. Flammability testing of just the textiles may be limited to vertical burn or OSU calorimeter testing, depending upon how the textile is used, as textiles on seat coverings are typically tested with the entire seating. To accelerate development of lower flammability textiles that could be inserted into other aircraft interior applications, repeatable test protocols that measure the inherent heat release of these textiles is desirable. In the paper, we present work on the study the inherent heat release of wool and wool + natural or synthetic fiber blends, in the form of woven textiles. The wool was tested as is, or was combined with cotton, linen, or nylon fibers. Similar color fabrics were chosen from commercial sources to minimize the effects of color on ignition behavior. The textile heat release was studied as a function of heat flux (35, 50, 85 kW/m^2) via cone calorimeter (ASTM E1354), with additional studies on how the thermal backing materials (ceramic brick or mineral wool) affected heat release measurements and repeatability. The research found that heat flux does affect measured heat release, as expected, and also found that backing material affected the results as well. Mineral wool tended to give higher heat release measurements, but more irregular measurement data, whereas ceramic brick tended to give slightly lower heat release measurements, but more repeatable fire behavior. The reasons for this behavior, as well as how the different animal fiber and animal fiber/natural/synthetic fiber blends performed will be discussed and presented as a potential screening protocol for considering textile flammability behavior, and potential selection, in aircraft applications.