



**Federal Aviation  
Administration**

# International Aircraft Materials Fire Test Working Group Meeting

## Test Plan for Proposed Cargo Liner Advisory Circular Material

Presented to: International Aircraft Materials Fire Test  
Working Group

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# Background

- **The proposed guidance submitted by the Cargo Liner AC Task Group is currently under review.**
- **Some of the items proposed by the task group, as well as items to be added by the FAA, will need to be tested before they can be implemented into an Advisory Circular.**



# Items to be Tested

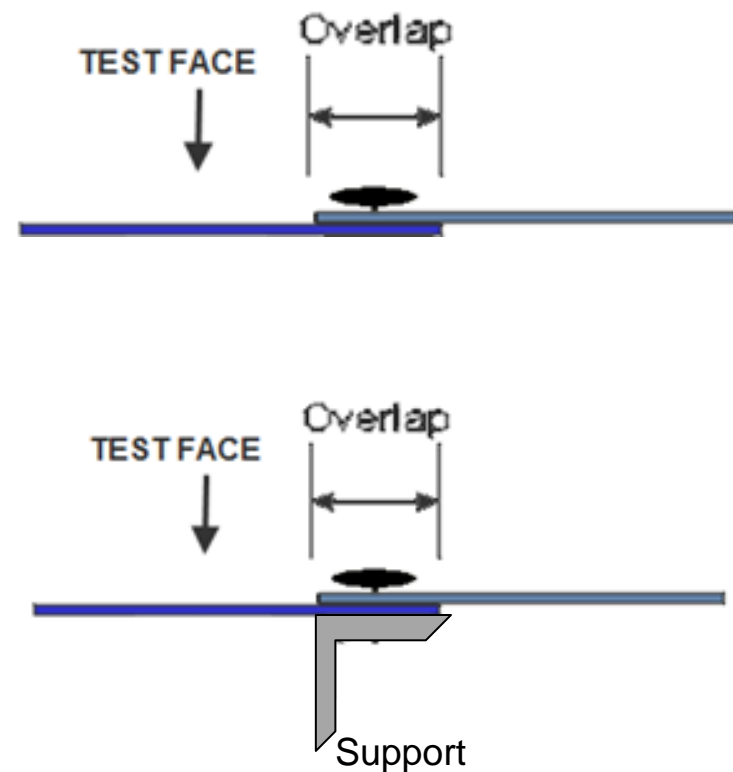
- **Backside Burning**
  - Define acceptable time and/or temperature during backside burning of a test material
- **Fastener Pitch**
  - Test proposed maximum safe fastener spacing for standard liner joint configurations
- **NexGen Burner Calibration**
  - Define thermocouple configuration and calibration temperatures
- **Exhaust Flow**
  - Determine allowable minimum/maximum exhaust airflow rates in test chamber

# Backside Burning

- **From the Handbook:**
  - “Occasionally, the back face ignition is due to the test flame wrapping around the sample holder, directly igniting backside outgasses. This is not considered a failure, but may void the test.”
- **Plan to run multiple tests using a woven epoxy “Conolite” cargo liner which is known to be a passing material**
- **Ignite outgasses using an ignition source located above the liner material**
- **Observe the amount of time required for the back side burning to self extinguish**
- **Determine if a time limit is required for self extinguishment, or material can be considered a failure based only on exceeding the 400°F failure criteria**

# Fastener Pitch

- The guidance material has proposed that the following joint configurations require no testing:
- Overlap joint of **laminated liners with a 1” or greater overlap, and 4” or less spacing between fireproof fasteners** when the liners pass the oil burner Material Only Test. (This test exclusion does not apply to sandwich panels.)
- Overlap joint of **laminated liners with a metallic support on the backside of the joint and 1” or greater overlap, and 9” or less spacing between fireproof fasteners.** The liners pass the oil burner Material Only Test and metallic support is at least 1” wide and 0.04” thick.



# Fastener Pitch

- **Construct samples based on description of standard joint as described in the guidance material**
- **Joints will be constructed from a heavy woven “Conolite” material, as well as a thinner Tedlar coated liner in order to determine, if any, the effect of cargo liner thickness on fastener pitch**
- **Fireproof steel button-head rivets will be used to fasten the joints together**
- **The metallic support will be constructed from 0.04” thickness 2024 aluminum alloy in the shape of an “L” bracket**
- **Samples will be tested to ensure no flame penetration and temperatures measured 4 inches above the center of the panel remain under 400°F**

# NexGen Burner Calibration

- The current calibration requirement in the Handbook was written specifically for the Park burner using the 7 thermocouple rake with 1/16" SS sheathed K-type thermocouples
- The NexGen sonic burner currently uses a 7 thermocouple rake with 1/8" SS sheathed K-type thermocouples
- All things being equal, a 1/8" TC will often read significantly lower than a 1/16" TC when exposed to the same burner flame
- A calibration temperature requirement specific to the NexGen burner will need to be developed, as the NexGen burner does not always calibrate to the current Park burner standards
- This calibration requirement will be used to ensure there are no significant problems with the NexGen burner, not fine tune the burner flame, as there are no adjustments to be made on the NexGen sonic burner
- The FAA will test using new as well as old and weathered thermocouples such that the calibration requirement will be reasonable to achieve without the constant need to install new thermocouples in order to meet the calibration criteria



# Exhaust Flow

- **Tests have shown that the airflow rate created by the exhaust fume hood in test labs can often impact the results of a test**
- **Too low an airflow can cause elevated temperatures in the test chamber, while higher airflows may lower temperatures measured at the cargo liner test sample**
- **Tests will be run in order to determine a suitable airflow range that will have a minimal impact on the test result**
- **This will involve running tests while varying the airflow rate through the use of baffles and controlling fan speed**
- **Data from previous cargo round robins will be studied to determine an appropriate target temperature measured above the cargo liner sample**
- **The airflow can then be manipulated until this temperature range is achieved**
- **This would be the “target” airflow, which would then have tolerances applied**



# Questions?

