Material Similarity using MCC Method - June 2020 FTWG

John Harris – The Boeing Company

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Overview - Task Group Goal

• Characterize flammability property parameters of a material using the MCC method

• Comparison of MCC flammability parameters using material similarity process
  • Assess if there is a significant change in the fundamental flammability properties.
  • Material similarity assessment supporting a similarity determination of the material change will eliminate the need to assess the specific FAR flammability requirements for all the different part configurations where this material is used.

• Validate MCC Similarity Process:
  • Develop case studies to validate the process.
Path to Advisory Circular (Material Similarity)

- FAA Tech Note on Baseline Correction for MCC methods A and B - ECD 6/26
- FAA Tech Note: Physical Basis for Using Fire Growth Constant (FGC) as a MCC metric – ECD 6/26
- FAA Tech Note on Similarity Criterion and Industry Case Studies - Complete
- Revision of ASTM D7309 ballot to include baseline correction - In progress
- Pilot Inter-Lab Study (ILS) FTWG participation in ASTM ILS
- Full scale Inter-Lab Study (ILS) executed with additional data points including FGC - TBD
- Revision of ASTM D7309 specification to include FGC as a MCC metric - TBD
- Draft Advisory Circular for Material Similarity using MCC method – TBD
Why is ILS Important?

• Need for industry-wide standardization on MCC testing process and data reduction
  • New revisions implemented for ASTM D7309 to account for CO₂ production and for methods A and B
  • Expanding use of MCC method utilizing FGC metric for process control and receiving inspection heat release testing

• ILS pilot study will provide a test run of the D7309 test method to allow for modifications to be made before the final ILS

• ILS results will support future ASTM revision incorporating FGC as a metric (for some applications)

• ILS presents an opportunity for participants to form users' group facilitating open communication in a community of practice

Community of Practice will promote technical knowledge/testing expertise for the MCC method and would also serve to support the ASTM sub committee D20.30
FAA International Aircraft Materials Fire Test Forum
Material Change Similarity Task Group

ILS: Point of Discussion for Break-Out Session

• Some ILS FAQs
  • Number of participating labs must be ≥ 6 (preference for > 10 labs)
  • Registration information should include which ASTM D7309 test method, materials tested (approx. 5-7), material suppliers, participating labs, and number of replicates (approx. 3-5)
  • ILS procedures may include FGC or other procedures not currently in the standard (but later incorporated)

• ILS pilot study planning session to be scheduled
  • Develop pilot study draft for review
    • Define pilot study deliverables
    • Methods and materials (number of replicates, etc)
    • Outline of scheduled activities
    • Address any question from participating labs and make adjustments to ILS procedure as needed

• High level description of ILS steps (last slide)

Boeing-Industry-FAA collaborative effort on standardized MCC testing - Open for discussion
FAA International Aircraft Materials Fire Test Forum  
Material Change Similarity Task Group

**ILS: Points of Discussion**

Register Work Item / ILS with ASTM

Discussion of ILS with ASTM Technical Contact (TC) during conference call
    - Samples / Sample Funding / Sample Distribution (materials, suppliers, etc)

ILS Participants (lab solicitation)

Lab Instructions for material process and testing

Data Report Form – Data from ILS collected & sent to ASTM

Data Submission - ASTM will track data submitted by the lab participants.

Statistical Summary - ASTM compute the repeatability and reproducibility

Research Report (RR) – Generated by ILS data along with data analysis and the precision and bias statement.

Precision and Bias Statement - Precision and bias statement included on the next ballot.

Approval - ASTM will assign a RR#, and send out copies to the TC and the participating labs.