

Burnthrough Round Robin

Update

Presented to: IAMFTWG

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**Federal Aviation
Administration**

2017 Comparative Test Series: In Progress

- **Participation by 11 labs across 3 continents**

1. Accufleet – USA
2. Airbus – Germany
3. Boeing – USA
4. DGA – France
5. Embraer – Brazil
6. FAATC – USA
7. Govmark – USA
8. Jehier – France
9. Rescoll – France
10. Resonate – N. Ireland
11. Triumph – USA

- **Each lab shipped samples for two-part test series**
 - 10 PAN-8579 9 oz/yd² felt samples for picture frame testing
 - 10 PAN-8611 16 oz/yd² felt samples for picture frame testing
 - 6 Brook One BO856B-II thermal acoustic insulation blankets for test rig testing
- **Testing with original stator (with igniters and wires)**
 - 5 PAN-8579
 - 5 PAN-8611
 - 6 BO856B-II (3 tests worth)
- **Testing with new stator (no igniters or wires)**
 - 5 PAN-8579
 - 5 PAN-8611
- **Comprehensive testing instructions e-mailed to each lab**



Test Details

FAA Insulation Burnthrough Round Robin 2016

Participant Instructions

Introduction

Thank you for volunteering to participate in this round robin comparative test series. The main objective of this test series is to quantify the lab-to-lab reproducibility and in-lab repeatability. The results will be kept anonymous as to not affect the business of any lab participating; in each presentation to the working group and any subsequent technical report, all labs will be identified with a code rather than the lab name. Each package sent to the labs contains three different sample types:

1. 10 PAN-8579 9 oz/yd² felt samples for picture frame testing
2. 10 PAN-8611 16 oz/yd² felt samples for picture frame testing
3. 6 Brook One BO856B-II thermal acoustic insulation blankets for test rig testing

Upon receipt of the test samples, place them in a conditioned environment for at least 24 hours prior to testing. The testing will be divided into two phases:

1. Testing with original stator (with igniters and wires)
 - a. 5 PAN-8579
 - b. 5 PAN-8611
 - c. 6 BO856B-II (3 tests worth)
2. Testing with new stator (no igniters or wires)
 - a. 5 PAN-8579
 - b. 5 PAN-8611

Requirements

In order to successfully complete this study, each lab will need the following items:

1. NexGen burner built according to the FAA specifications in AC25.856b
2. Original stator with igniters AND new, igniterless stator with method of external ignition
3. Picture frame blanket holder
4. Gardon gauge on back of picture frame blanket holder
5. Thermal acoustic insulation test rig as described in Chapter 24 of the first test handbook

Burner Setup

Please follow these steps to ensure all burners are set up in the same manner:

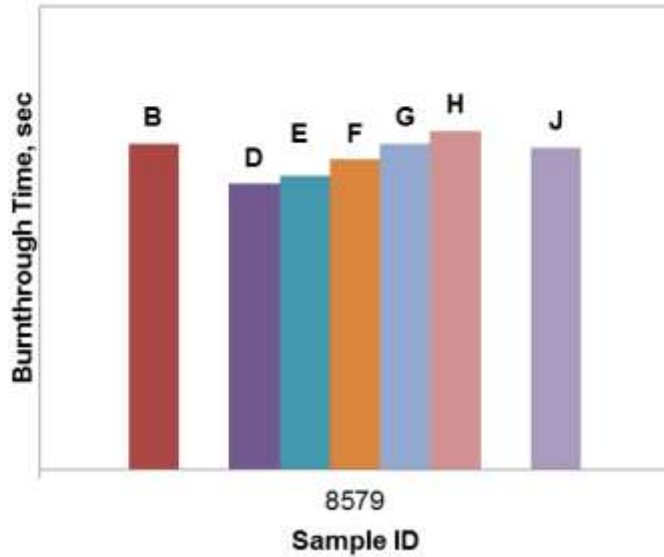
1. With the draft tube off, check the distance of the front stator face to the nozzle tip as displayed in Figure 1. This should measure 4 inches.

- Instructions include all details for setting up burners, equipment, and test samples
- A gardon gauge is to be installed on picture frame to get heat flux data while testing PAN samples



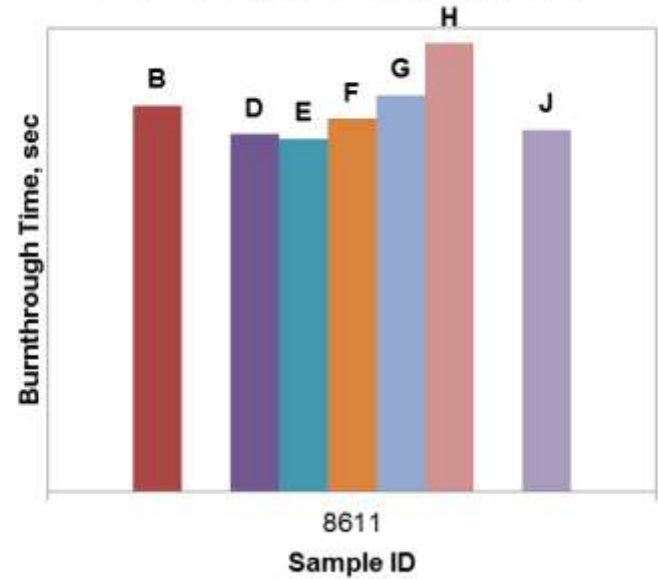
Phase I Results

8579 Average Burnthrough Times



- A
- B
- C
- D
- E
- F
- G
- H
- I
- J
- K

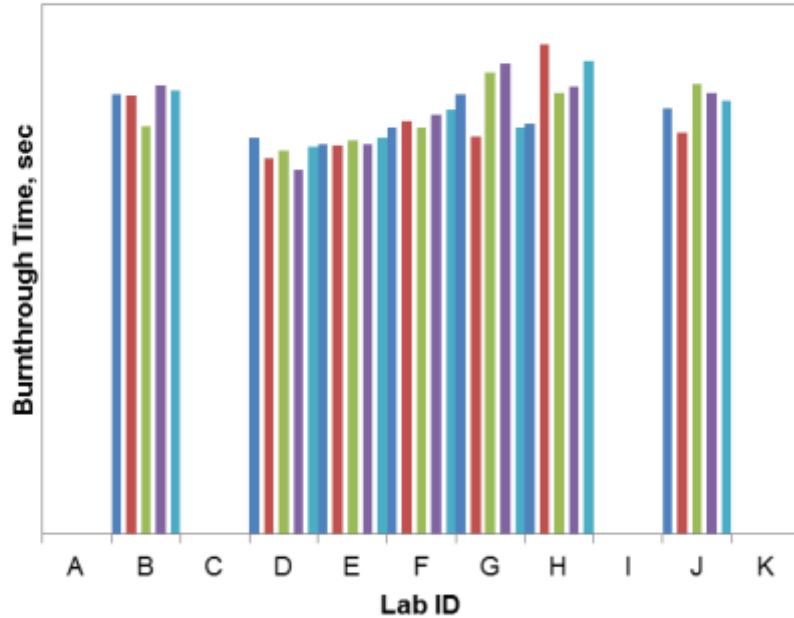
8611 Average Burnthrough Times



- A
- B
- C
- D
- E
- F
- G
- H
- I
- J
- K

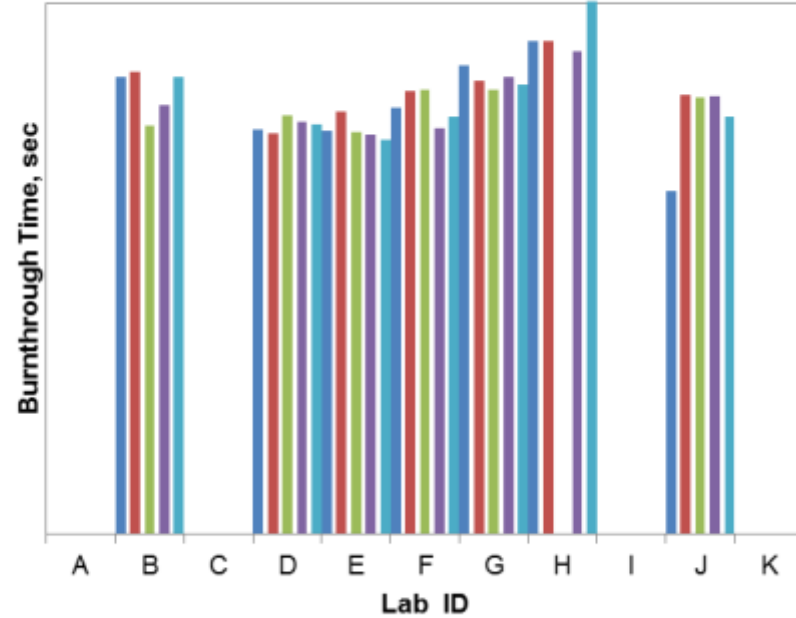


8579 Burnthrough Times



% Standard Deviation Across All Tests
7.18%

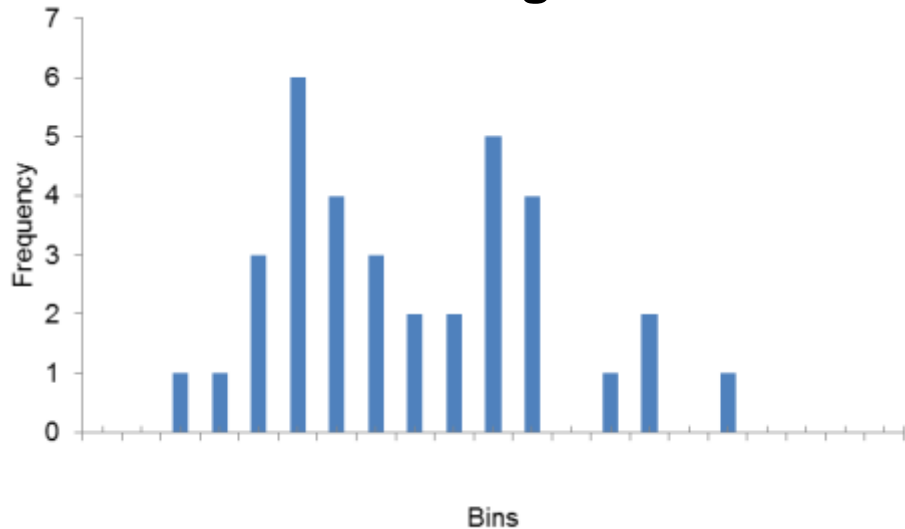
8611 Burnthrough Times



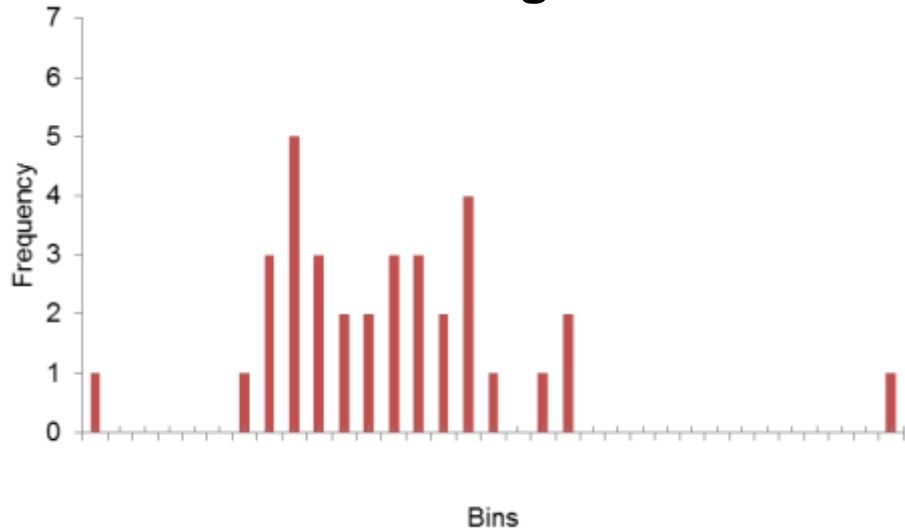
% Standard Deviation Across All Tests
9.38%



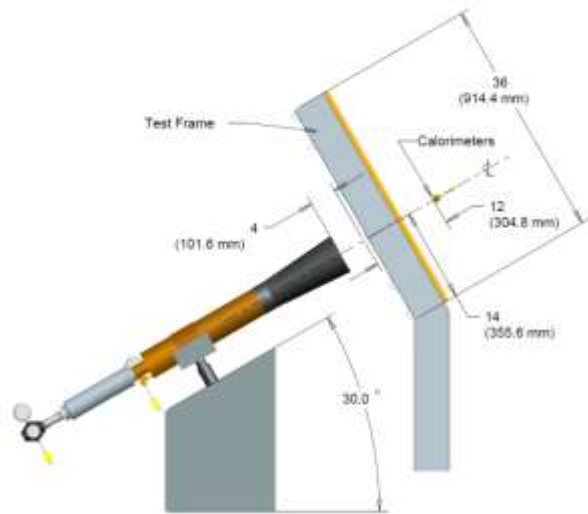
8579 Histogram



8611 Histogram

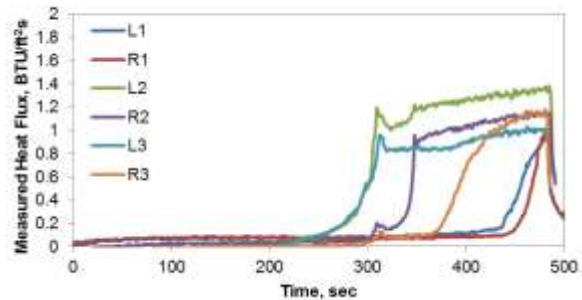


Insulation Blanket Burnthrough Tests

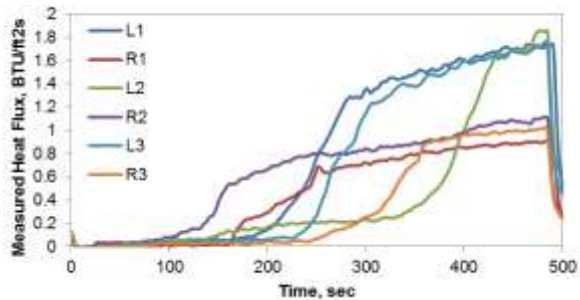


Brook One BO856B-II Thermal Acoustic Insulation Blankets

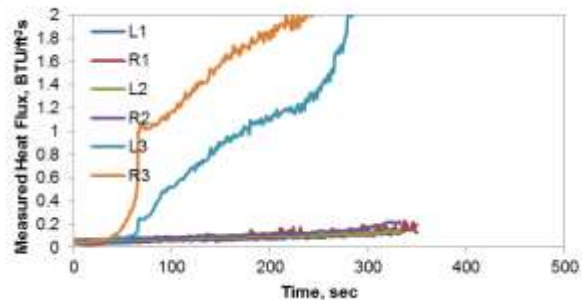
Lab B



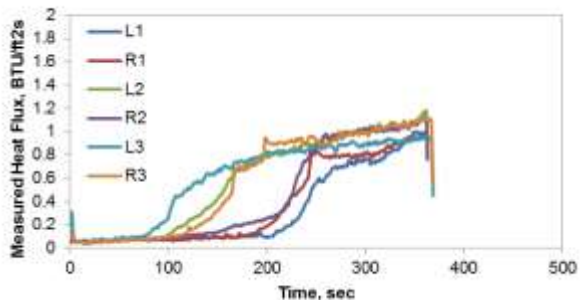
Lab F



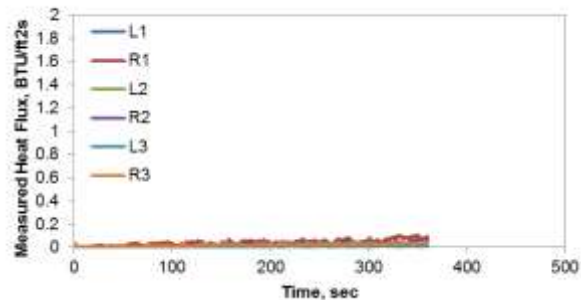
Lab D



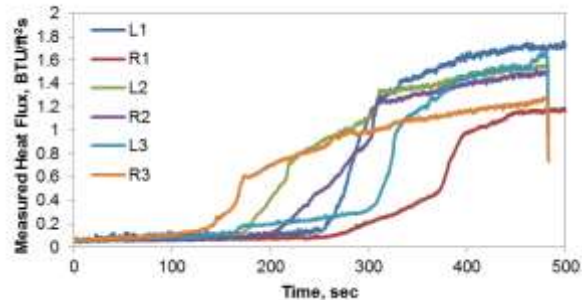
Lab G



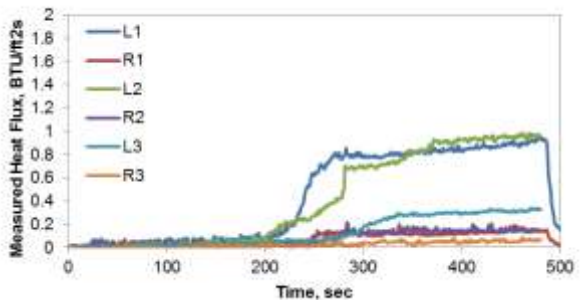
Lab J



Lab E



Lab H



Summary

- **7 out of 11 labs have submitted results**
- **So far, data looks good**
 - ~7% Std Dev for 8579
 - ~9% Std Dev for 8611
 - Burnthrough blankets below 2.0 BTU/ft²s during 4-minute test at all labs (depending on slit in back blanket)