



Federal Aviation
Administration

International Aircraft Materials Fire Test Working Group Meeting

Cargo Liner Oil Burner Update

Presented to: International Aircraft Materials Fire Test
Working Group

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Introduction

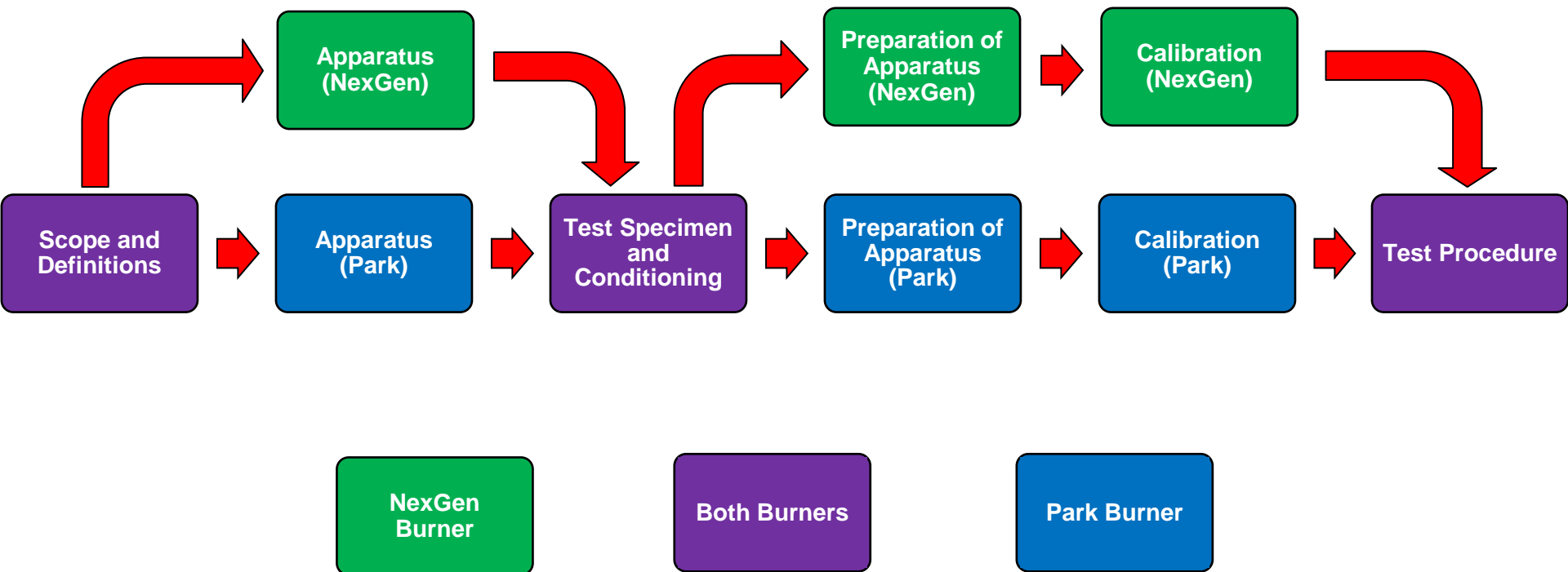
- **Handbook Update**
- **Test Method Process Comparison**
- **Changes for the Workbook**
- **Test Lab Variables**



Handbook Update

- **The anticipated updates to the Handbook will allow the use of the NexGen sonic burner for certification testing of aircraft cargo liner materials**
- **The NexGen burner will not be subject to a flame temperature calibration, but rather a flame temperature check to ensure proper operation of the burner**

Handbook Test Method



Workbook

- **Backside burning guidance**
- **Stainless steel sample rig construction**
- **Stationary mounting of the NexGen burner and translational motion of test sample**
- **Test cell airflow measurement**



Backside Burning

- A brief auto ignition of the back face of a liner material may occur, but is not indicative of a failure.
- However, this should be taken into consideration when selecting a cargo liner material for an aircraft, and what impact backside burning may have on materials located behind the cargo liner.



Current NexGen Status

- **Testing has shown that the NexGen burner is capable of generating repeatable test results in its current form**
- **The design of the burner is currently considered complete**
- **Interlab studies have confirmed the NexGen burner is capable of repeatable results within a lab**
- **However, there have been discrepancies when comparing the data of one lab to another**
- **It is unlikely the burner is the cause of lab data discrepancies**

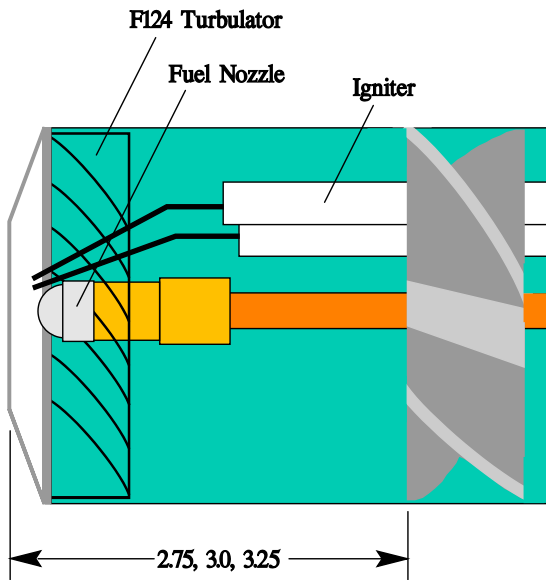


Current NexGen Status

- **The NexGen burner was designed to match the test results of the Park burner as closely as possible**
- **FAA tests have shown this to be a success, while other labs have shown differences in the performance of the NexGen and Park burners**
- **All NexGen burners are the same while all Park burners are unique**
- **Performance of the NexGen burner remains the same, but Park burner performance may vary for each lab**
- **The number of configurations for the Park burner are infinite**

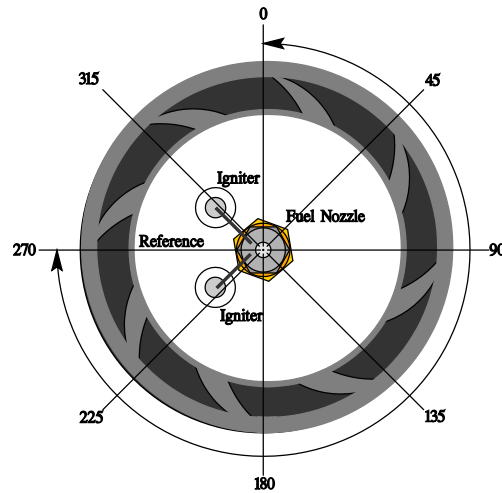


Park Adjustability Example



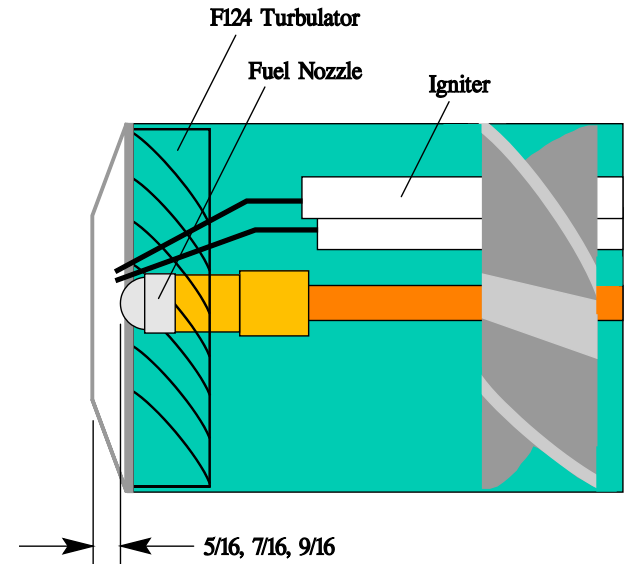
3 Positions

X



8 Angles

X



3 Depths

= 72 Combinations

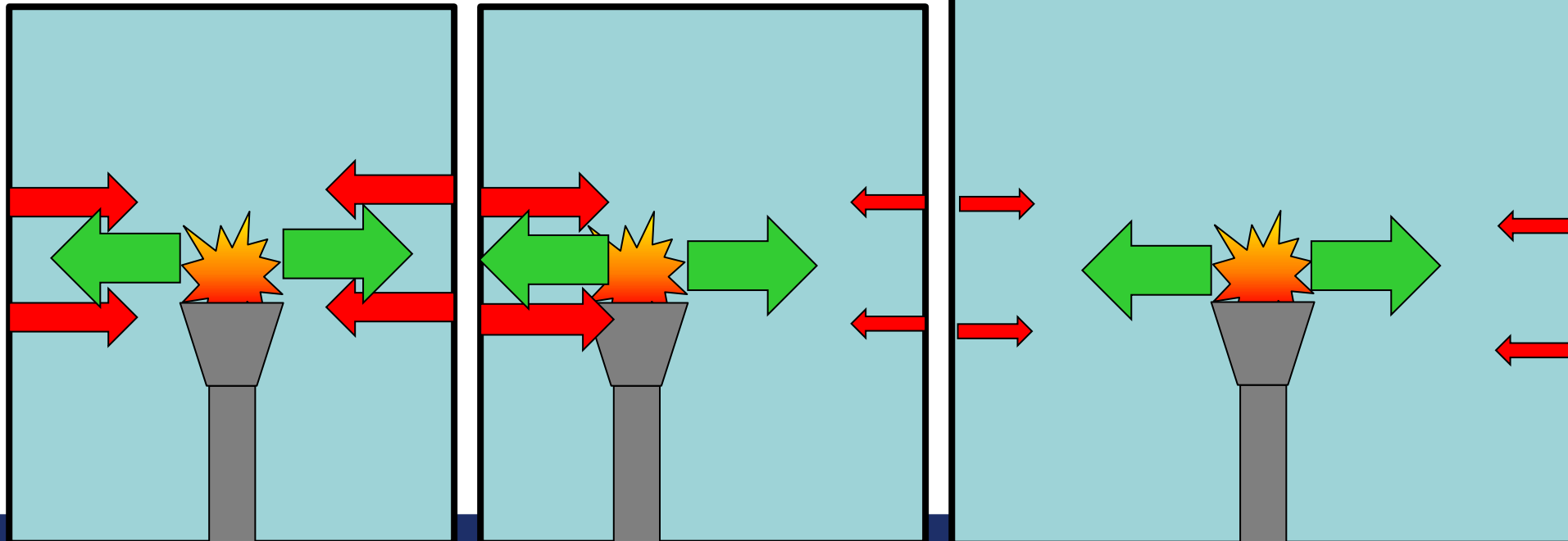
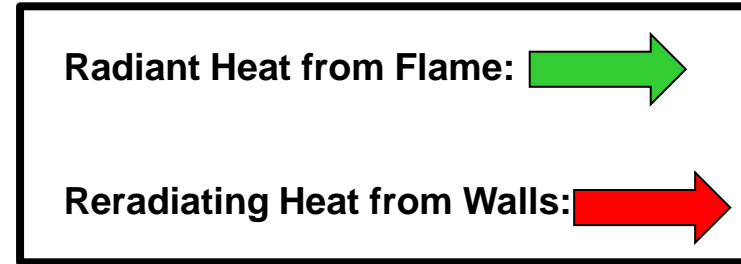
Lab Variables

- **NexGen should always perform the same if assembled and operating correctly**
- **Differences in the test lab setups are likely the cause of data discrepancies**
- **Test cell size, ventilation hood height, airflow in the test cell**



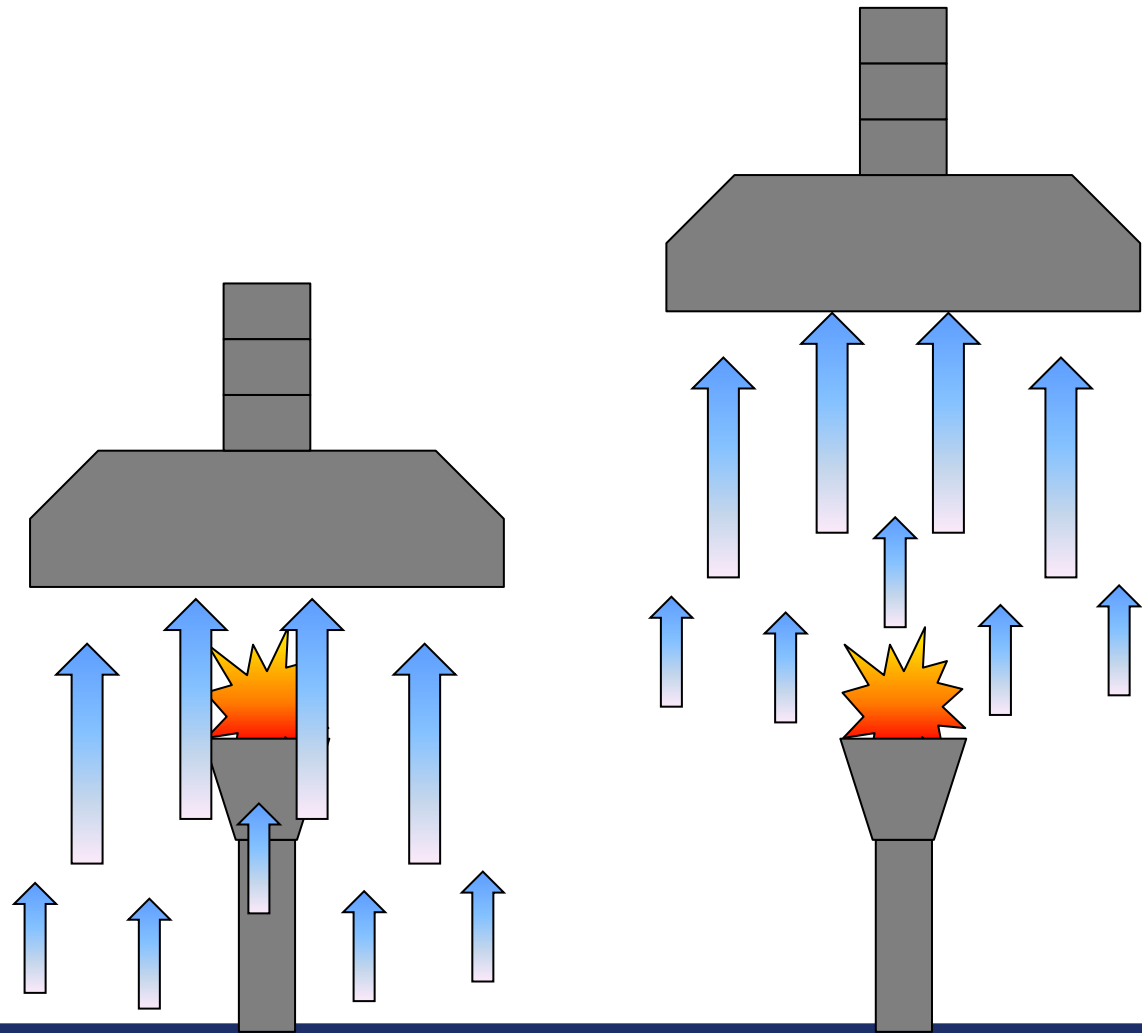
Test Cell Size

•Heat from the flame can be reradiated back toward the test sample in smaller test cells, or in cases where the burner is in close proximity to a wall. Larger test cells, or in cases where the burner is placed farther from walls, would show less of this effect. Ambient air temperature can increase quickly in smaller test cells.



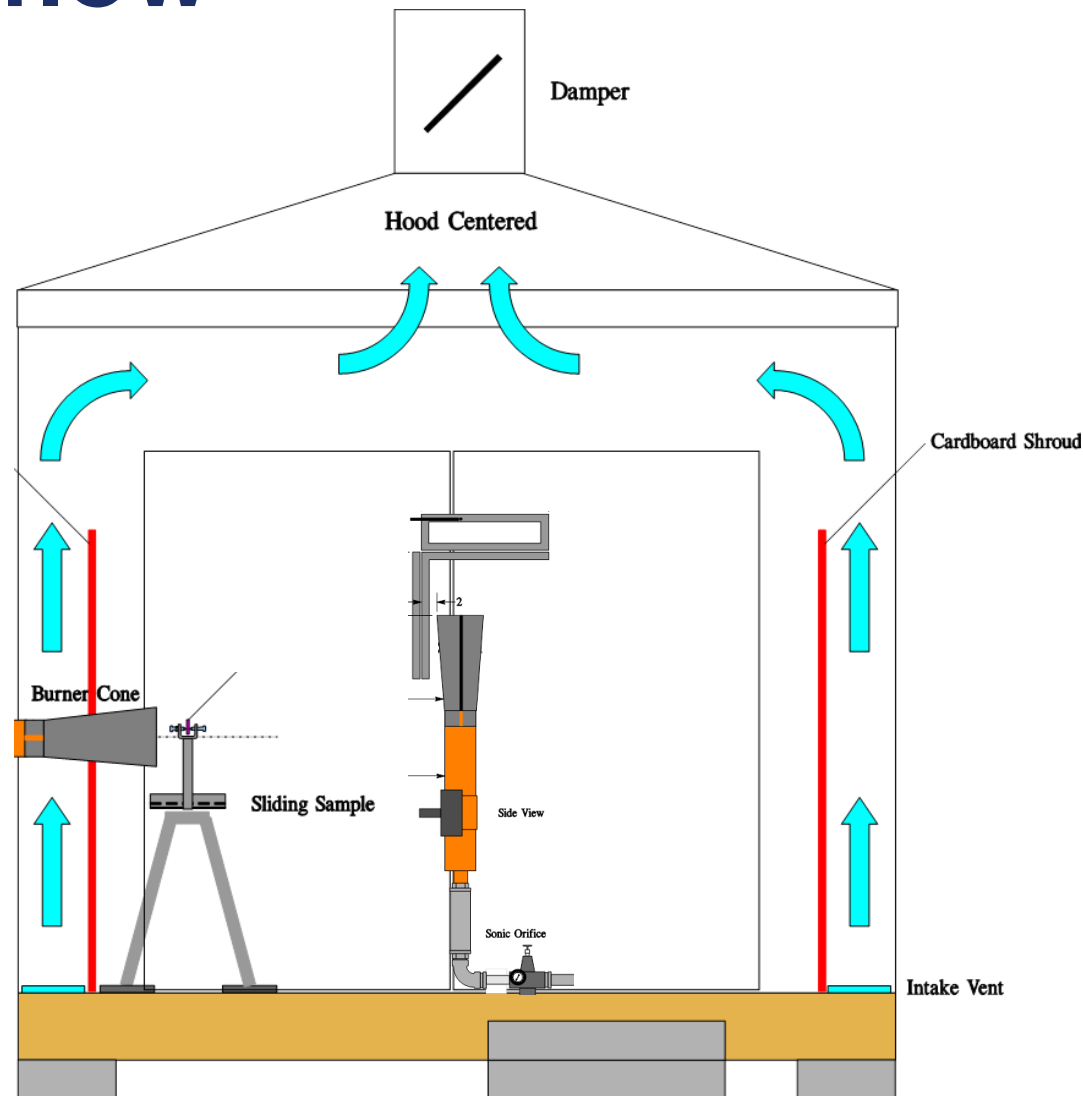
Ventilation Hood Height

- The height of the ventilation hood can have an impact on the temperatures measured above the liner test sample. A hood located close to the sample will pull more hot air and heat away from the sample resulting in a lowered temperature reading compared a hood located at an appropriate height.



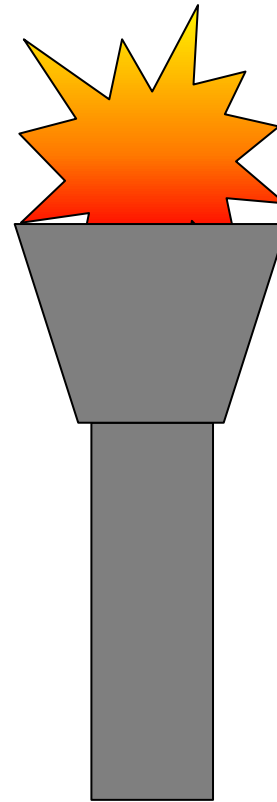
Ventilation Airflow

•It is important to keep the airflow below the maximum recommended flow rate. This will have a similar effect as utilizing a hood located too close to the sample. However, insufficient airflow can raise the temperature of the ambient air. Airflow can be controlled using a multispeed fan or a damper in the ventilation duct. Shrouds may be used in cases where a closed test cell uses floor vents for incoming air.



Unknown Variables

- These are items that may or may not have an impact on cargo liner burner test results. Test cell size and ventilation hood height were previously variables not necessarily considered in the test method.
- **Other possible variables**
 - Humidity
 - Ambient air temperature
 - Barometric pressure
 - System components not specified in the Handbook



Questions?

