FAA Bunsen Burner Test Chamber

FAR 25.853 Flame Tester for Aircraft Interior Materials

Standards: FAR 25.853, CCAR-25 §25.853, HB5469 (Aircraft cabin & cargo compartment materials)
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1. Product Overview

The KingPo FAA Vertical Bunsen Burner Test Chamber is used to evaluate the flammability performance of non-metallic materials in aircraft cabin and cargo compartments. It performs vertical, horizontal, and angled Bunsen burner tests in accordance with FAA FAR 25.853 to support material qualification and airworthiness certification.

The chamber assesses combustion behavior by applying a defined Bunsen burner flame to test specimens, measuring parameters such as flame spread, afterflame time, afterglow time, and burn length under controlled conditions. It is essential for evaluating materials used in aircraft cabins, including seat covers, carpets, wall panels, insulation, and other non-metallic components.

2. Applicable Standards

- **FAR 25.853** — Federal Aviation Regulations – Compartment interiors
- **CCAR-25 §25.853** — Chinese Civil Aviation Regulations – Airworthiness standards for transport category airplanes
- **HB5469** — Related Chinese aviation material flammability test method

3. Test Purpose

In the FAA Bunsen burner test, a defined flame from a Bunsen burner with a specified inner diameter is applied to the test specimen for a set duration. The test evaluates the material's reaction to flame exposure by measuring parameters such as afterflame time, afterglow time, and burn length.

This method determines the flammability characteristics of non-metallic materials intended for use in aircraft cabin and cargo compartments, ensuring compliance with airworthiness safety requirements.

4. Key Features

- **Multi-Angle Testing Capability** — Supports vertical, horizontal, 45°, and 60° inclined combustion tests in one chamber.
- **Precise Burner System** — Bunsen burner with inner diameter of 9.5 ± 0.5 mm and adjustable flame height from 20 mm to 100 mm.
- **Included Flame Gauges** — Equipped with 38 mm and 22 mm flame height gauges for accurate setup.
- **Automatic Ignition** — Electronic igniter with reliable automatic ignition function.
- **Multi-Timer System** — Three independent timers for flame application, combustion duration, and flame delay measurement.
- **Robust Chamber Design** — Stainless steel combustion chamber with heat-resistant tempered glass observation window.
- **Precise Gas Control** — Methane pressure regulating system with needle valve for precise flame adjustment.

5. Technical Specifications

Parameter	Specification	Notes
Applicable Standards	FAR 25.853, CCAR-25 §25.853, HB5469	Aircraft cabin & cargo compartment materials
Test Angles	Vertical, Horizontal, 45°, 60°	Multi-angle testing in one chamber
Burner Inner Diameter	9.5 ± 0.5 mm	Per FAA Bunsen burner requirements
Flame Height	20 – 100 mm adjustable	Includes 38 mm and 22 mm gauges
Ignition System	Electronic automatic ignition	Reliable test initiation
Gas Type	Methane	With pressure regulating system
Chamber Material	Stainless steel	Corrosion resistant
Observation Window	Heat-resistant tempered glass	For safe observation

Timing System	Three timers (0–99.99 s/m/h)	Flame application, combustion, and delay timers
Power Supply	AC 220V / 50Hz	–

6. Typical Test Procedure

1. Prepare and mount the specimen in the chamber at the required test angle.
2. Adjust the Bunsen burner flame height using the provided gauges (22 mm or 38 mm).
3. Initiate automatic ignition and apply the flame for the specified duration.
4. Record afterflame time, afterglow time, and burn length using the multi-timer system.
5. Document results and prepare the chamber for the next test.

7. Applications

- Aircraft Interior Material Manufacturers — Flammability qualification testing of cabin and cargo compartment materials (textiles, plastics, composites, insulation)
- Aviation Testing Laboratories — FAR 25.853 and CCAR-25 compliance Bunsen burner testing and formal test reports
- Aircraft Manufacturers and OEMs — Evaluating and approving interior materials from suppliers
- Certification Bodies and Airworthiness Authorities — Assessing flammability performance for type certification
- Research Institutions and Material Developers — Studying combustion characteristics of new aviation-grade materials and flame-retardant coatings

8. Standard Configuration

The standard system typically includes:

- Stainless steel combustion chamber with heat-resistant tempered glass observation window
- Precision Bunsen burner system with needle valve for gas flow adjustment
- Electronic automatic ignition system
- Methane pressure regulating system
- Three independent timers (0–99.99 s/m/h)
- Included 38 mm and 22 mm flame height gauges

Note: Designed to meet FAA FAR 25.853 and CCAR-25 §25.853 requirements. Technical support available for equipment operation and test method guidance.

9. Ordering Information

To provide the most suitable configuration, please confirm the following when requesting a quotation:

- Primary material types to be tested (e.g., textiles, plastics, composites)
- Preferred test angles (vertical, horizontal, 45°, 60°)
- Any need for additional fixtures or automation features
- Calibration or extended documentation requirements

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