AEROSPACE RECOMMENDED PRACTICE

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Superseding ARP5627

Flammability Test Method for Aircraft Comfort Blankets

RATIONALE

Comfort blankets use are now limited and are rarely used in today's cabins and if requested, airlines are now requiring additional fees from customers, thus the committee agreed that no need to revise this ARP.

STABILIZED NOTICE

This document has been declared “Stabilized” by the SAE S-9A Safety Equipment and Survival Systems Committee and will no longer be subjected to periodic reviews for currency. Users are responsible for verifying references and continued suitability of technical requirements. Newer technology may exist.

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FOREWORD

This SAE Aerospace Recommended Practice (ARP) is written by the S-9 committee to document a flammability test for comfort blankets used in transport category aircraft cabins. The information contained herein was developed by the FAA Tech Center and originally presented in DOT/FAA/AR-96-15.

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1. SCOPE:

This SAE Aerospace Recommended Practice (ARP) applies to blankets used for passenger comfort within transport category aircraft cabins. When the term “blanket” is used in this document it refers to all blankets that are provided by the aircraft operator for passenger warmth.

1.1 Purpose:

This document provides a recommended procedure for a flammability test to be performed on transport category aircraft comfort blankets. This test will enhance safety for cabin occupants.

2. REFERENCES:

The test defined in this document was included in DOT/FAA/AR-96-15, “The Development of a Flammability Test Method for Aircraft Blankets” as Appendices A and B. This report may be downloaded from the FAA Technical Center’s website at www.tc.faa.gov.

Title 14 Code of Federal Regulations Part 25, AIRWORTHINESS STANDARDS: TRANSPORT CATEGORY AIRCRAFT may be purchased from the Superintendent of Documents, Government Printing Office, Washington, DC 20402-9325.

3. DEFINITIONS:

IGNITION TIME: Ignition time is the length of time the burner flame is applied to the specimen.

FLAME TIME: Flame time is the time in seconds that the specimen continues to flame after the burner flame is removed from beneath the specimen. Surface burning that results in a glow but not in a flame is not considered flame time.

DRIP FLAME TIME: Drip flame time is the time in seconds that any flaming material continues to flame after falling from the specimen to the floor of the chamber.

4. TEST APPARATUS:

4.1 Test Cabinet:

A draft-free cabinet shall be fabricated to the specifications depicted in Figures 1, 2, and 3. A hole should be drilled into the side of the cabinet to accept the Wall Mount of the test fixture (Figure 4). The hole should be drilled at a height that will allow proper alignment of the test fixture with respect to the burner (6.2.1). It is suggested that the cabinet be located inside an exhaust hood to facilitate clearing the cabinet of smoke after each test. Stainless steel or other corrosion resistant metal 0.040 inch (1 mm) thick shall be used for the bottom surface of the cabinet.

4.2 Test Fixture:

The test fixture, (depicted in Figure 4) should be fabricated of corrosion resistant metal, as detailed in Figure 5. This test fixture is identical to that used for the forty-five-degree test specified in FAR 25.855.

4.3 Burner:

The burner shall be a Bunsen or Tirrill type having a 3/8-inch (10-mm) inside diameter barrel and equipped with a needle valve located at the bottom of the burner barrel to adjust the gas flow rate and thereby adjust the flame height There shall be a way to remove or extinguish the flame when the cabinet door is closed.

4.4 Burner Fuel:

Methane gas (99% minimum purity) is the preferred fuel, because it can be used to produce a pure diffusion flame without adding air through any aspirating holes at the bottom of the burner flame barrel.

4.5 Plumbing for Gas Supply:

The necessary gas connections and the applicable plumbing should be implemented as shown in Figure 6. A control valve (stopcock) shall be installed between the gas supply and the burner inlet capable of regulating the gas pressure at 2-1/2 psi ± 1/4 psi (17 kPa ± 2 kPa).

4.6 Flame Height Indicator:

A removable height indicator shall be used to aid in setting the height of the flame. The indicator should have a prong extending 1.5 inches (38 mm) above the top of the burner barrel and spaced 1 inch (25 mm) away from the burner barrel as shown in Figure 6. With methane gas, it is desirable to have two prongs for measuring the flame height; one prong to indicate the height of the inner cone of the flame and one prong to indicate the height of the tip of the flame. When the height of the flame tip is 1-1/2 inches (38 mm) long, the desired flame profile is achieved.

4.7 Timer:

A stopwatch or other device calibrated to the nearest 0.1 second.

5. TEST SPECIMENS:

5.1 Specimen Selection:

Specimens shall be cut from new blankets.

5.2 Specimen Number:

At least three specimens shall be prepared and tested.

5.3 Specimen Size:

The test fixture requires an 8-inch by 8-inch specimen to be tested. However, an 11-inch by 11-inch specimen shall be cut in order to pull the specimen taut once secured in the test fixture. The excess material may be trimmed.

5.4 Specimen Thickness:

The specimen shall be of 4-ply configuration, accomplished by stacking four individual blanket specimens cut to size.

5.5 Specimen Conditioning:

Specimens shall be conditioned in the test fixture to 70 °F ± 5 °F (21 °C ± 3 °C), and 50% ± 5% relative humidity for 24 hours. Each specimen must remain in the conditioning environment until it is subjected to the flame.

6. PROCEDURES:

6.1 Burner Adjustment:

6.1.1 Ensure that air supplied to the burner is shut off by closing any air adjustment on the burner.

6.1.2 Open the stopcock in the gas line fully and light the burner.

6.1.3 Adjust the needle valve on the burner to give the proper 1-1/2-inch (38-mm) flame tip height and then remove the flame height indicator.

6.1.4 Measure the flame temperature in the center of the flame using a calibrated thermocouple pyrometer. The minimum temperature is 1550 °F. The maximum temperature is 1650 °F.

6.2 Test Process:

6.2.1 Insert the test fixture with specimen in place into the test cabinet. The bottom of the specimen shall be 3/4 inch above the level at the top of the burner.

6.2.2 Close the cabinet door and keep it closed during the test.

6.2.3 Position the burner such that it is directly under the geometric center of the test specimen using the rod shown in Figure 7 that extends through the cabinet side. Start the timer immediately upon positioning the burner.

6.2.4 Apply the flame for 12 seconds and then withdraw it by moving the burner at least 3 inches (76 mm) away from the specimen or by turning the gas off. If the flame extinguishes during the ignition time for any reason, the test shall be rerun.

6.2.5 If flaming material falls from the test specimen, determine the drip flame time for the specimen. If no material falls from the specimen, the drip flame time is reported to be 0 seconds, and the notation “No Drip” is also reported. If there is more than one drip, the drip flame time reported is that of the drip that flames longest. If succeeding flaming drips reignite earlier drips that flamed, the drip flame time reported is the total of all flaming drips.

6.2.6 Determine the flame time for the specimen.

6.2.7 After all flaming ceases, the cabinet door should be opened slowly to clear the test cabinet of fumes and smoke. The exhaust fan may be turned on to facilitate clearing the smoke and fumes.

6.2.8 Remove any material that fell from the specimen to the bottom of the cabinet. If necessary, clean the test cabinet window prior to testing the next specimen.

7. REPORT:

7.1 Report the composition and color of the material tested.

7.2 Test Results:

7.2.1 Ignition Time: Report the ignition time.

7.2.2 Flame Time: Report the flame time for all specimens tested. Determine and report the average value for flame time.

7.2.3 Drip Flame Time: Report the drip flame time for all specimens tested. Determine and report the average value for drip flame time. For specimens that have no drips, report “0” for the drip flame time and also report “No Drips.”

8. PASS/FAIL REQUIREMENTS:

8.1 Flame Time:

If the average flame time for all of the specimens tested exceeds 15 seconds, the tested blanket is not suitable for use in transport category aircraft.

8.2 Drip Flame Time:

If the average drip extinguishing time for all of the specimens tested exceeds 5 seconds, the tested blanket is not suitable for use in transport category aircraft.

8.3 Burn Area:

If the average burn area of all the specimens tested exceeds 75% of the exposed specimen size, the tested blanket is not suitable for use in transport category aircraft.

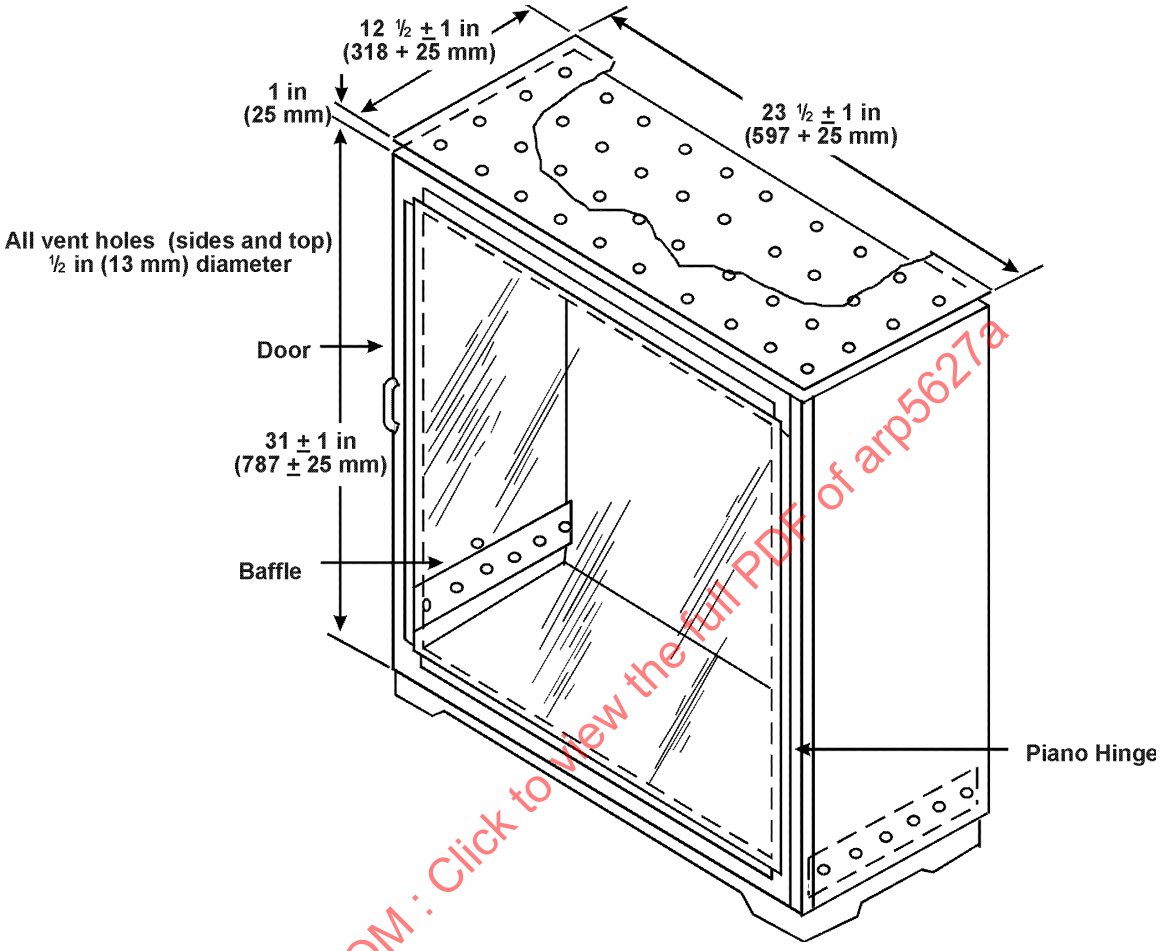

FIGURE 1 - Sketch of Bunsen Burner Test Cabinet

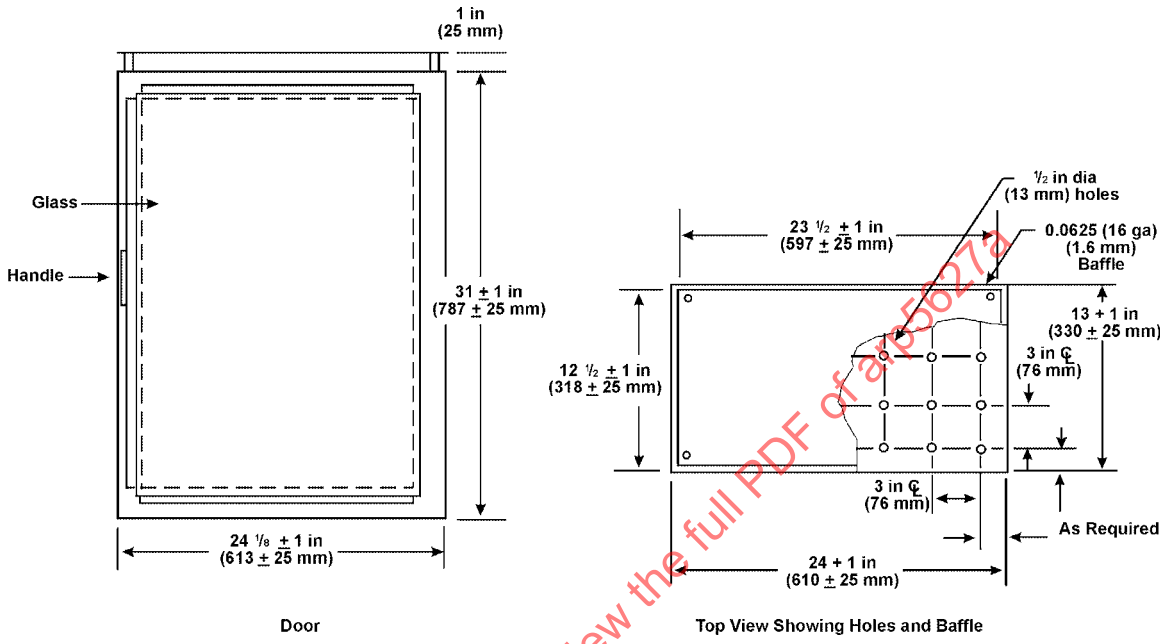

FIGURE 2 - Front and Top View of Bunsen Burner Test Cabinet

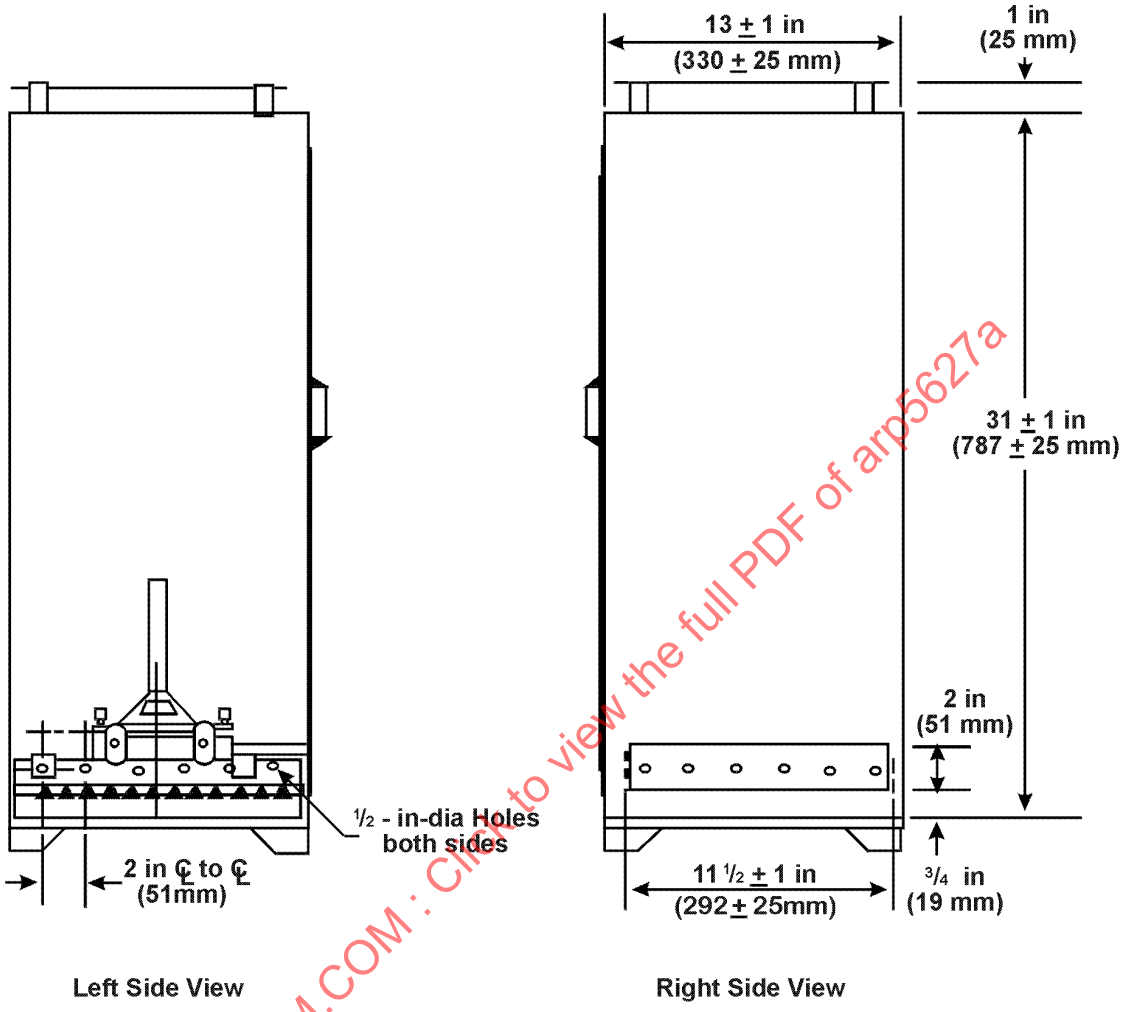

FIGURE 3 - Side Views of Bunsen Burner Test Cabinet

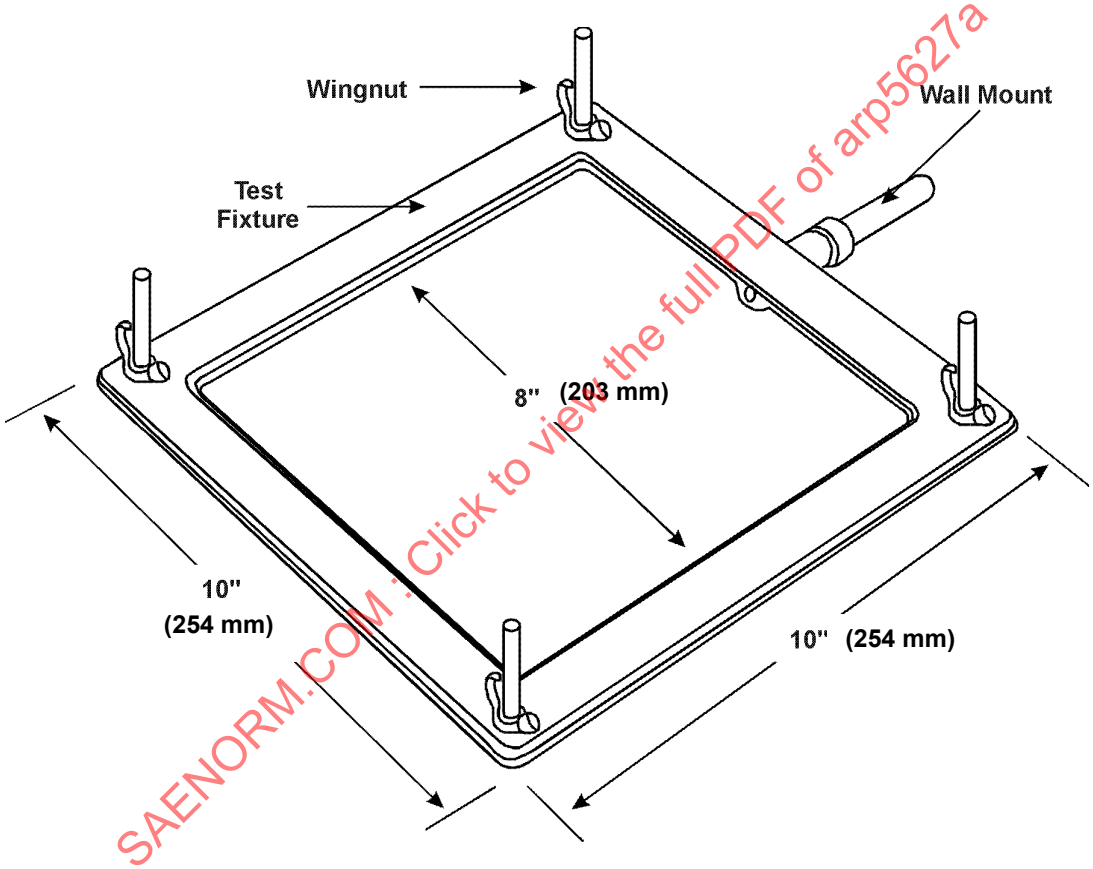

FIGURE 4 - Horizontal Test Fixture