U.S. Department
of Transportation
Federal Aviation
Administration

Advisory Circular

Subject: Flammability Tests

Date: 2/15/2013 **AC No:** 23-2A

Initiated by: ACE-100 **Change:** 1

1. PURPOSE. This change revises existing paragraph referencing within the document. The change number and the date of the changed material are shown at the top of each changed page. Vertical bars in the margin indicate the changed material. Pages having no changes retain the same heading information.

2. PRINCIPAL CHANGES. Paragraphs 8a(6)(c) and 8b(1) change references to paragraphs 7a(1) through 7a(6) to 8a(1) through 8a(6). No content changes were made. A vertical change bar appears next to the effected paragraphs.

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more hazardous direction. If the more hazardous direction is unknown, then test in both directions.

(1) Condition the specimens to a temperature of 65 ^{o}F to 75 ^{o}F and at 45 to 55 percent relative humidity until moisture equilibrium is reached, or for 24 hours, before testing. Remove only one specimen from the conditioning environment at a time, and immediately subject it to the flame test.

(2) For plain cloth and rigid materials, follow the procedure described below.

(a) Insert the specimen into the holder with the surface that will be exposed when installed in the airplane, facing down. Clamp it such that a two-inch wide center strip is exposed with a ½ inch clearance between the holder and each end of the specimen.

(b) Adjust the burner to give a flame height of 1-½ inches.

(c) Slide the specimen holder into the cabinet and into the test position so that the end of the specimen is ¾ inch above the top of the burner when ignited. Burn approximately 1-½ inches of the specimen before starting the timing device. Stop the timing at least 1 inch before the burning front reaches the end of the specimen.

(d) Determine the average burn rate of the three specimens, using the time required to travel along a minimum of 10 inches of each specimen. The material is acceptable if:

1. The specimens do not support combustion after the ignition flame is applied for 15 seconds; or

2. The average burn rate of the three specimens does not exceed 20 inches per minute; or

3. The flame extinguishes itself and subsequent burning without a flame does not extend into the undamaged areas.

(3) For napped or tufted cloth, follow the procedure below.

(a) Comb the cloth twice against the nap or tufting so that the nap or tufting is uniformly raised.

(b) If the cloth is double-napped, use a stop to prevent a flash from traveling across the underside of the cloth and igniting the other end of the specimen before the flash has traveled across the exposed surface.

(c) In all other respects, the procedure must be as described for plain cloth in paragraphs 8a(5)(a) through 8a(5)(d), above.

b. The following flammability test is considered acceptable for demonstrating compliance with regulations for flame-resistant materials, except for electrical wire (reference §§ 23.853(a), 23.1365(b), and 23.1385(d)).

(1) The same apparatus, size of specimens and procedures as specified in paragraphs 8a(1) through 8a(6) above for testing flash-resistant materials can also be used for testing flame-resistant materials. The following exceptions replace paragraph 8a(5)(d) and are applicable to flame-resistant testing.

(a) Determine the average burn rate of the three specimens, using the time required to travel along a minimum of 10 inches on each specimen. The material is acceptable if:

1. The specimens do not support combustion after the ignition flame is applied for 15 seconds; or

2. The average burn rate of the three specimens does not exceed 4 inches per minute; or

3. The flame extinguishes itself and subsequent burning without a flame does not extend into the undamaged areas.

c. The following flammability test is considered acceptable for demonstrating compliance with regulations for flame-resistant electrical wire (reference §§ 23.853(a) and 23.1365(b)).

(1) The apparatus should be similar to that shown in Chapter 4, Section 4.3, Apparatus, of DOT/FAA/AR-00/12, Aircraft Materials Fire Test Handbook, dated April 2000.

(2) Mount the burner underneath the specimen so that the burner is perpendicular to the specimen.

(3) The minimum flame temperature measured by a calibrated thermocouple pyrometer in the center of the flame must be 1550 ^{o}F.

(4) For each sample unit, test three specimens, with a test area length between the lower clamp and upper pulley of at least 24 inches.

(5) Condition the specimens to a temperature of 65 ^{o}F to 75 ^{o}F and at 45 to 55 percent relative humidity until moisture equilibrium is reached, or for 24 hours, before testing. Remove only one specimen from the conditioning environment at a time, and immediately subject it to the flame test.

(6) Adjust the burner to give a flame height of 1-½ inches.

(7) Position the burner so that its top is ¾ inch from the specimen. Apply the flame to the specimen 8 inches from the lower clamped end for 30 seconds.