



U.S. Department
of Transportation
**Federal Aviation
Administration**

Memorandum

Subject: **INFORMATION:** Final Policy for Flammability Testing
per 14 CFR Part 23, Sections 23.853, 23.855 & and
23.1359; Final Policy No. PS-ACE100-2001-02
(previously ACE-01-23.853-01)

Date: January 23, 2002

From: Manager, Small Airplane Directorate, ACE-100

To: AIR-100, AEU-100, ANE-150, ANE-170, ASW-150,
ASW-190, ACE-115A, ACE-115C, ACE-115W,
ACE-115N, ANM-100S, ANM-100D, ANM-100L,
ACE-112

The purpose of this policy is for standardization in the approval of flammability testing of materials used in small airplanes per 14 CFR part 23, §§ 23.853, 23.855 and 23.1359.

The Small Airplane Directorate policy for all certification projects, including engineering assistance for major alterations on FAA Form 337 Field Approvals, is that:

- a. The only materials for which flammability testing is not required are those that would not contribute significantly to the propagation of a fire per 14 CFR, part 23, Section 23.853. These materials/parts are typically small parts. Material certification by an applicant or their supplier can be used in the determination that the material will not significantly contribute to the propagation of the fire. Company/Supplier material certifications cannot be used in lieu of official FAA flammability testing.
- b. All other proposed materials must be tested to the flammability level required by the certification basis and category of airplane. Advisory Circular (AC) 23-2, Flammability Tests, gives guidance on conducting flash-resistant, flame-resistant, fire-resistant, fireproof and self-extinguishing tests. The AC specifies that Appendix F of part 23 is to be used for proposed self-extinguishing materials. These are official FAA certification tests, which require witnessing by either an FAA certification engineer or an FAA Flammability Designated Engineering Representative (DER) who has authorization to witness a test. We will also accept from a DER submittal of an 8110-3 that attests to the validity of the data being approved. This can occur when the people running the test are well known to the DER and judged by the DER to be technically competent and reliable. Test data may only be approved by the FAA or by a DER with that approval authority.

Note: DOT/FAA/CT-89/15” Aircraft Material Fire Test Handbook” is good reference material.

- c. A DER should not use FAA Form 8110-3 for flammability test results for a material when the testing is for quality assurance purposes for either a manufacturer or a repair station. Testing done for these purposes should be documented in a quality assurance report. When the material supports a certification project or an alteration or repair, FAA form 8110-3 is the DER’s only means of approving the technical data. The DER should determine if the testing documented in the test report adequately addresses the applicable airworthiness standards for the intended use of the material. If found acceptable, the DER may generate an 8110-3 that references the test report. For the purposes of flammability testing, this technical data includes records of preconditioning of the test specimen. The flammability testing required by the certification basis is as follows:

Passenger and Crew Compartment Interiors, § 23.853

<u>Certification Basis</u>	<u>Category</u>	<u>Material Flammability Testing</u>
CAR 3 (1945-1946) Effective November 13, 1945	Normal Restricted Experimental	Flame resistant if smoking allowed
CAR 3 (1946-1949) Effective December 15, 1946	Normal, Utility & Acrobatic	Flash resistant
CAR 3 (1949-1965) Effective November 1, 1949	Normal, Utility & Acrobatic	Flash resistant or flame resistant if smoking is allowed in a specific compartment
Part 23 Through Amdt. 23-22 (1965-1978) Effective December 5, 1978	Normal, Utility & Acrobatic	Flame resistant
Part 23 (78-present) Amdt. 23-23 & Subs & Subsequent (1978-present) Effective December 1, 1978	Normal, Utility & Acrobatic	Flame resistant or self-extinguishing per Appendix F for materials located on the cabin side of the firewall

Part 23 Amdt. 23-34 & Subsequent (1987-present) Effective February 17, 1987	Commuter	Self-extinguishing per Appendix F except for small parts in § 23.853(d)(3)(v)
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Cargo and Baggage Compartment Fire Protection, § 23.855

Part 23 Amdt. 23-49 (1996-present) Effective March 11, 1996	Normal, Utility & Acrobatic	Meet provisions of § 23.853(d)(3)
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Part 23 Amdt. 23-49 (1996-present) Effective March 11, 1996	Commuter	Meet provisions of § 23.853(d)(3)
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Electrical System Fire Protection, § 23.1359

Part 23 (96-present) Amdt. 23-49 Effective March 11, 1996	Normal, Utility, Acrobatic & Commuter	Meet provisions of § 23.863 and § 23.1182 and wire insulation self extinguishing per Appendix F, 60 degree angle test
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1. Per AC 23-2, cloth, wire and sheet specimens may be taken from a sample segment (batch/roll/sheet). In this case, FAA conformed test specimens/parts per 14 CFR part 21, § 21.33, are not required. Instead, conformity can be established for these types of materials on the basis of bill of materials, roll identification, etc. The 8110-3 should state it applies to the specific batch/roll/sheet for which the test was conducted.

Note: Wire specified in AC 43-13-1B, Section 7, has been determined to be acceptable for use in certified airplanes and may be used without flammability testing.

2. In other cases, test specimens must be fabricated to accurately represent the production assembly or must be cut from actual parts. These parts should be conformed per 14 CFR part 21, § 21.33, prior to testing.
3. In both 1 and 2 above, a DER must comply with Order 8110.37C, Designated Engineering Representative Guidance Handbook. While we understand that in the past some DER's have not always submitted 8110-3 forms with Make and Model information, 8110-3 forms must always be complete, including the Make and Model information.

- d. Flammability requirements have not been applied to conventional aircraft structure. However, the use of composite structure can result in a need to test a representative build-up panel with an interior material, adhesive and composite structure, unless it is demonstrated the interior material does not permit an ignition source to penetrate it.
- e. Interior flammability tests may be required with build-up samples. Experience has shown that the thin exposed layer can burn away and expose the adhesive layer, which in many cases is extremely flammable and would contribute significantly to the propagation of a fire. Testing only the exposed layer without the adhesive backing would not be representative. Adhesives with a flame-retardant additive should be encouraged and listed; known flammable adhesives should not be used.
- f. We have reviewed the test criteria of part 25, Appendix F, part I and have determined that parts/materials tested to the part 25 test criteria are acceptable data to show compliance with the flame-resistant material requirement of § 23.853(a).

If you have any questions, please contact Mr. Les Taylor either by telephone at (816) 329-4134, or by e mail at leslie.b.taylor@faa.gov or by fax at 816-329-4090.

S/ Michael K. Dahl
for

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