



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

Memorandum

Subject: INFORMATION: Final Policy Statement for Flammability of
Electrical Wire used in Part 23 Aircraft per 14 CFR, part 23,
§§ 23.853 and 23.1359, PS-ACE100-2004-10023

Date: July 9, 2004

From: Manager, Small Airplane Directorate, ACE-100

Reply to Attn.
of: Les Taylor

(816) 329-4134

To: SEE DISTRIBUTION

Policy

The Small Airplane Directorate has determined there is a need for policy concerning the installation of electrical wire in small airplanes regarding the applicability of AC 43.13-1B, Change 1 for flammability of electrical wire used in part 23 aircraft. Electrical wire listed in section 7 of AC 43.13-1B, Change 1 complies with §§ 23.853 and 23.1359 and is acceptable for use in part 23 aircraft without further testing. An applicant must supply compliance data to these flammability regulations for any other electrical wire or cable.

Background

Recently, questions were raised as to whether coaxial cable per MIL-C-17 and wire per MIL-W-22759/16 and /18 meets the flammability requirements of 14 CFR, part 23, because of differences between the Military Standards and parts 23 and 25.

Chapter 11, section 7, paragraph 11-85a of AC 43.13-1B, Change 1, states that the wires in Table 11-11 and Table 11-12 “have been determined to meet the flammability requirements of Title 14 of the Code of Federal Regulation (14 CFR), part 25, § 25.869(a)(4), and the applicable portion of part 1 of Appendix F of part 25.” Section 25.869, Fire protection systems, paragraph (a)(4) states “Insulation on electrical wire and electrical cable installed in any area of the fuselage must be self-extinguishing when tested in accordance with the applicable portions of part 1, Appendix F of this part.” The applicable portion of Appendix F of part 25 is part 1, paragraph (a)(3) which states “Insulation on electrical wire or cable installed in any area of the fuselage must be self-extinguishing when subjected to the 60 degree test specified in part 1 of this appendix. The average burn length may not exceed three inches, and the average flame time after removal of the flame source may not exceed 30 seconds. Drippings from the test specimen may not continue to flame for more than an average of 3 seconds after falling.”

Section 23.1359 is the most severe test requirement for part 23 aircraft. It has the same test procedure, burn length, and flame times as part 1 of Appendix F of part 25. Therefore, in meeting § 25.869(a)(4), wire in AC 43.13-1B, Change 1 meets the most severe requirement in part 23 and exceeds the earlier flammability requirements.

Electrical wire flammability requirements vary based on aircraft category and amendment level.

For normal, utility and acrobatic categories prior to amendment 23-49, all parts including wiring are required to be flame-resistant per § 23.853 (as defined in 14 CFR, part 1).

For commuter category prior to amendment 23-49, all materials including wiring must be self-extinguishing per § 23.853 and part 23, Appendix F.

For all part 23 categories with an amendment level of 23-49 and subsequent, § 23.1359 and part 23, Appendix F, requires self-extinguishing insulation on electrical wires and cables.

Effect of this Policy

The general policy stated in this document does not constitute a new regulation or create what the courts refer to as a “binding norm”. Aircraft Certification Offices (ACOs) should implement office policy when applicable to the specific project. Whenever an applicant's proposed method of compliance is outside this established policy, it must be coordinated with the policy issuing office, e.g., through the issue paper process or equivalent. Similarly, if the implementing office becomes aware of reasons that an applicant's proposal that meets this policy should not be approved, the office must coordinate its response with the policy issuing office.

Applicants should expect that the certificating officials will consider this information when making findings of compliance relevant to new certificate actions. Also, as with all advisory material, this policy statement identifies one means, but not the only means, of compliance.

Conclusion

Accepted practices outlined in AC 43.13-1B, Change 1 are sufficient for modifications to small airplanes. So any wires specified in Table 11-11 and Table 11-12 of the AC, including MIL-W-22759/16 and /18, are acceptable for use in all small airplane projects without flammability testing.

Any other wire or cable, including coaxial cables such as MIL-C-17/RG-400, that are not listed in AC 43.13-1B, Change 1, as approved for § 25.869(a)(4), cannot be installed in small airplanes without flammability testing per 14 CFR, part 23, to the applicable requirement or an approved equivalent method.

For questions and assistance regarding this policy, please contact Mr. Les Taylor at (816) 329-4134, by fax (816) 329-4090, or by e-mail at leslie.b.taylor@faa.gov.

S/James E. Jackson for

Dorenda D. Baker
Manager, Small Airplane Directorate
Aircraft Certification Service

DISTRIBUTION

Manager, Aircraft Engineering Division, AIR-100
Manager, Brussels Aircraft Certification Staff, AEU-100
Manager, Boston Aircraft Certification Office, ANE-150
Manager, New York Aircraft Certification Office, ANE-170
Manager, Ft. Worth Airplane Certification Office, ASW-150
Manager, Special Certification Office, ASW-190
Manager, Atlanta Aircraft Certification Office, ACE-115A
Manager, Chicago Aircraft Certification Office, ACE-115C
Manager, Wichita Aircraft Certification Office, ACE-115W
Manager, Anchorage Aircraft Certification Office, ACE-115N
Manager, Seattle Aircraft Certification Office, ANM-100S
Manager, Denver Aircraft Certification Office, ANM-100D
Manager, Los Angeles Aircraft Certification Office, ANM-100L