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FAA POLICY STATEMENT – FLAMMABILITY TESTING OF INTERIOR MATERIALS – WHAT'S NEW

December 4, 2013

Disclaimer

- The information contained within this presentation is non-authoritative, but has the support of the technical experts of the FAA and industry. It is based on lessons learned during the Policy implementation. It should be considered only as further refinement of the policy guidance to be implemented on future projects with FAA/designee guidance. It shall not be disruptive to any in-work projects or induce additional activities for prior completed certification or in-work projects.

Where were we?

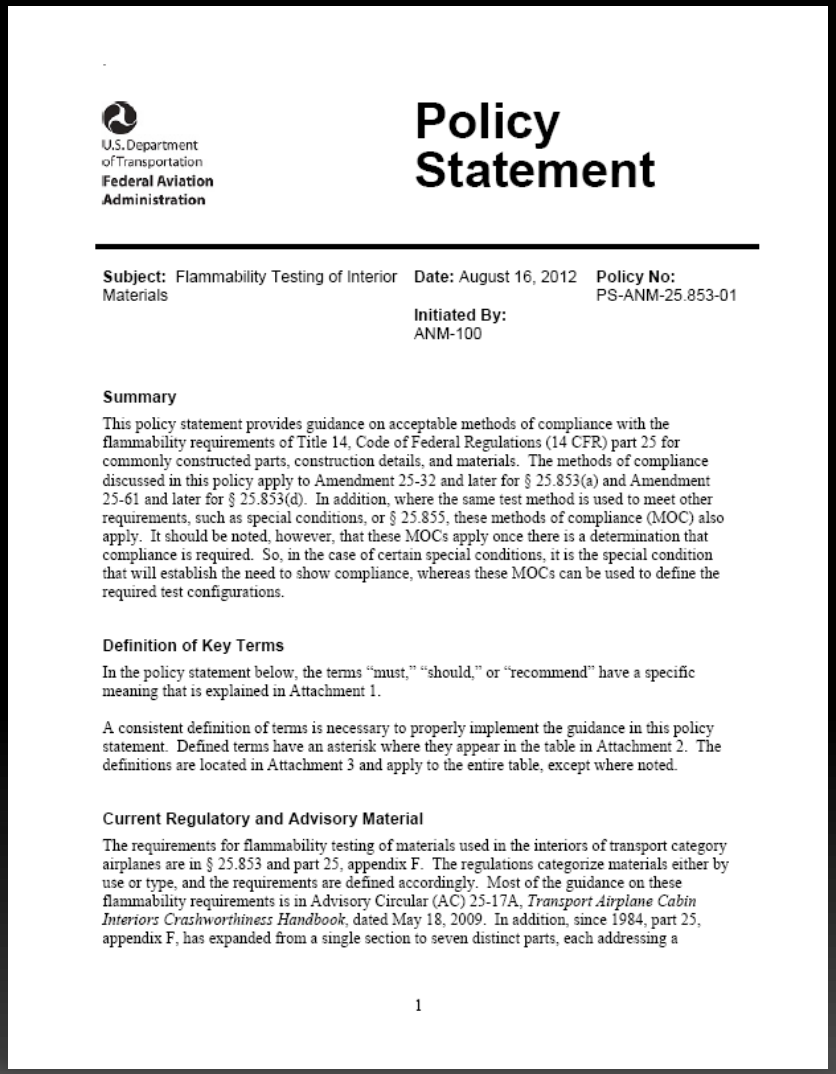
- FAA Flammability requirements and compliance methods were being interpreted differently among industry, regional FAA organizations, other regulatory agencies and industry.
- It was not uncommon that certain methods of compliance (MOC) approaches where acceptable by one FAA Aircraft Certification Office (ACO) and not another.
- Significant amount of time and money being spent on redundant testing with no added safety benefit to the public.

The past 4 years…

- The International Aircraft Fire Test Working Group formed a subtask group (FSTG) to collaborate, discuss, share/create data and propose industry agreed methods of compliance on various scenarios.
- Regulatory agencies were involved from the beginning to provide feedback.
- FSTG garnered interest and support from over 200 persons representing 80+ companies worldwide.

The past 4 years…

- FSTG published an FAA final report consisting of the group's methodologies, rationale, findings and MOC recommendations. http://www.fire.tc.faa.gov/pdf/tc12-10.pdf
- FAA Policy Statement was released closely based on FSTG's FAA Final Report in August 2012. The most recent revision (R2) was released on July 3, 2013.
  - PS-ANM-25.853-01-R2



U.S. Department of Transportation
Federal Aviation Administration

Policy Statement

Subject: Flammability Testing of Interior Materials | **Date:** August 16, 2012 | **Policy No:** PS-ANM-25.853-01

Initiated By: ANM-100

Summary

This policy statement provides guidance on acceptable methods of compliance with the flammability requirements of Title 14, Code of Federal Regulations (14 CFR) part 25 for commonly constructed parts, construction details, and materials. The methods of compliance discussed in this policy apply to Amendment 25-32 and later for § 25.853(a) and Amendment 25-61 and later for § 25.853(d). In addition, where the same test method is used to meet other requirements, such as special conditions, or § 25.855, these methods of compliance (MOC) also apply. It should be noted, however, that these MOCs apply once there is a determination that compliance is required. So, in the case of certain special conditions, it is the special condition that will establish the need to show compliance, whereas these MOCs can be used to define the required test configurations.

Definition of Key Terms

In the policy statement below, the terms "must," "should," or "recommend" have a specific meaning that is explained in Attachment 1.

A consistent definition of terms is necessary to properly implement the guidance in this policy statement. Defined terms have an asterisk where they appear in the table in Attachment 2. The definitions are located in Attachment 3 and apply to the entire table, except where noted.

Current Regulatory and Advisory Material

The requirements for flammability testing of materials used in the interiors of transport category airplanes are in § 25.853 and part 25, appendix F. The regulations categorize materials either by use or type, and the requirements are defined accordingly. Most of the guidance on these flammability requirements is in Advisory Circular (AC) 25-17A, *Transport Airplane Cabin Interiors Crashworthiness Handbook*, dated May 18, 2009. In addition, since 1984, part 25, appendix F, has expanded from a single section to seven distinct parts, each addressing a

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Questions of Interpretation

- Since its release, there have been questions regarding the interpretation of the policy.
- Revision 1 of the Policy clarified a number of those issues.
- Revision 2 clarified certain information on synthetic leather.
- This presentation provides clarifications requested by the industry and future proposals for MOCs.

Policy Statement Clarifications

- The following pages contain questions received from industry regarding the Policy Statement.
- The questions are in the general order of the Policy Statement reference numbers.
- The questions and answers have been reviewed with the FAA Transport Airplane Directorate.

Clarifications – PS 3 Thickness Ranges – Core vs Panel

- Can the thickness ranges be based on nominal core thickness rather than nominal panel thickness?

Answer

- Either basis is acceptable, as long as it is consistent for the part being shown compliant. Cannot use one panel based on core thickness and another using overall thickness (excluding decorative thickness).

Clarifications – PS 3 Thickness Ranges – Design vs As-Fabricated

- Which is more appropriate to use for PS 3, the theoretical (design) thickness or the measured, as fabricated thickness?

Answer

- Certification is determined by the type design. Item 3, thickness ranges, is based on type design thicknesses. As fabricated test coupons must be within type design tolerances.

Clarifications – PS 3 Thickness Ranges – Metal

- Can the thickness ranges [25.853(d)] be used for metal details (typically in bonded details)?

Answer

- Yes

Clarifications – PS3 Thinner Identical Panel 25.853(a)

- Can PS3 be used to substantiate a panel greater than .25" using an identical panel that is less than .25"?

Answer

- Yes

Clarifications – PS 3 Thickness Ranges – Use with PS 9 (Color)

- Can PS9, Thermoplastic, Elastomers and decorative non-textile floor coverings color, be used in conjunction with PS 3, Thickness Ranges ?

Answer

- No
- However, a proposal can be made through a certification plan that if a range of one color is established through test (e.g., tested 0.060" and 0.100" for one color), a second color of that plastic within the same thickness range can be certified by similarity using the above and PS9 for both 14CFR 25.853(a) and (d).

Clarifications – PS 9 Color of Thermoplastics, .. – Multi-Thickness

- Can PS9, Thermoplastic, Elastomers and decorative non-textile floor coverings color, be used in cases where the part varies in thickness, such as extrusions for 25.853(a)? If so, how can it be applied?

Answer

- Yes, by testing the part or extrusion, or testing the thinnest nominal thickness of the part or extrusion . For sheet, test the stock thickness.

Clarifications – PS9 Wire Colors

- Can PS9 be used to substantiate different colors of wire which are not contained in AC 43.13-1B?

Answer

- No, the Policy Statement doesn't apply to wire testing

Clarifications – PS 9 Color of Thermoplastics, .. – Integrally Colored

- For PS9, Color of Thermoplastics…, what is the definition of "Integrally Colored"?

Answer

- Integrally Colored is defined by the color of the material being the same throughout the material (given some variance due to fillers and process effects). For example, thermoplastics tend to be integrally colored or pigmented, while decorative laminates tend to be printed on a single surface.

Clarifications – PS 10 FASE – Referencing PS 3

- When using PS 10, is there a need to reference PS 3 as well for vertical burn compliance?

Answer

- No

Clarifications – PS 13 Synthetic Leather/Suede

13	Synthetic leather/suede	For Tapis Ultra leather™ and E-Leather™ SL3UL, SL3SL, and SL3L products, testing one color substantiates all other colors because all values have significant margin with respect to the pass/fail criteria for the 12-second vertical test.	Testing each color of synthetic leather/suede material is required.

- The MOC references the 12 second vertical burn, but can it be used for 60 second vertical burn compliance?

Answer

- This MOC can only be used for 12 second vertical burn compliance

Clarifications – PS 14 Metal

14	Aluminum/steel/ titanium parts (excluding powder coating)	Unfinished metal parts do not require testing. unless they contain more than 10% magnesium. Finished metal parts do not require testing provided: 1) standard paint/finishes are used, and 2) the parts do not contain more than 10%magnesium. Standard paint/finishes are defined as inorganic finishes (e.g., anodize, alodine), epoxy primers and topcoats, urethane topcoats, and corrosion inhibiting dry films. See item 15 below, for powder coatings.	The test requirement is decided based on size criteria. (See footnote 1.)

- PS14 implies that metal parts (such as galley counters) must be tested for heat release and smoke. Is this the case?

Answer

- The FAA does not intend for non-bonded bare, plated or inorganic coated metal (anodize, conversion coatings) to be tested for OSU and Smoke. Organic coatings on metals (paint, primer, corrosion inhibiter, etc) must be tested for Heat Release and Smoke if over the size criteria.

Clarifications – PS14 Metal Plating

- Can metal plating be considered a standard finish under PS14?

Answer

- Yes (it's metal)

Clarifications – PS 16 Embedded Metal Detail

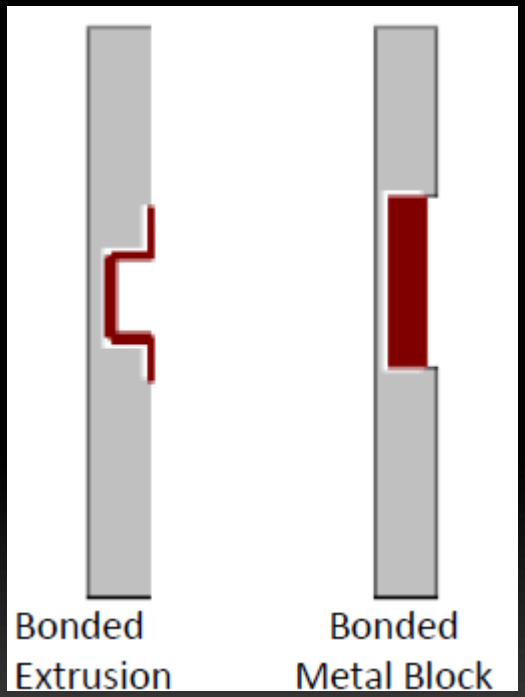
16	Embedded metal detail	No test requirement, provided the detail is at least 0.01" thick and is not constructed of more than 10% magnesium.	No test requirement.

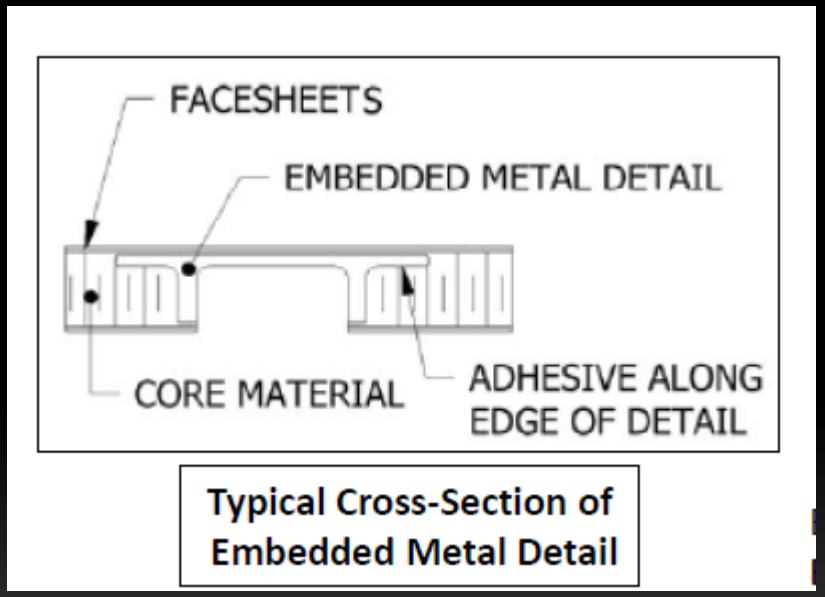
- If metal is bonded only to the surface of a panel, can PS16 be used as is implied in the presentation at the 2012 Indianapolis IAMFTWG meeting?

Answer

- No, this MOC is only applicable to metal that is embedded into a panel in some manner, although some of the metal may be on the panel surface. Use PS 21 for metal bonded only to the surface.

Embedded Metal Detail Examples





Clarifications – PS 21 Bonded Details - Carpets

- How should floor carpet be handled? Is it a bonded detail? (Bonded to floor with carpet tape or using adhesive coated carpet.) Can adhesively coated floor carpet squares (peel-and-stick) be tested alone (with release liner removed) to cover testing of both the carpet and adhesive?

Answer

- Yes, floor carpet (on the floor and associated stairs only) can be treated as a bonded detail whether bonded with carpet tape or pre-coated with adhesive (carpet squares). Carpet bonded with tape can be substantiated using of PS 21, options 1, 2, 3 or 4. Adhesive coated carpet squares (peel-and-stick) may be tested per options 3 on a worse case laminate or per option 4.
- Note – Not applicable to vertically (except stair risers) mounted textiles.

Clarifications – PS 21 Bonded Details – Detail Definition

- What is a bonded detail? Is there a size criterion? Can PS 21 be used when bonding 2 similar size parts together (e.g., two duct halves)?

Answer

- Definition in PS currently only allows items bonded to "panels". Panel being defined as a surface larger than the detail being bonded.
- For two equal parts, test the bonded construction.

Clarifications – PS 21 Bonded Details – Multiple Details

- Can PS 21 be used when bonding 2 or more details to a panel? For example, a decal bonded to a metal plate bonded to a panel on a galley door.

Answer

- Yes

Clarifications – PS 21 Bonded Details – Use with PS 9

- Can PS 9 be used when a plastic is bonded to metal and the color of the plastic changes?

Answer

- Yes

Clarifications – PS 21 Bonded Details – Failures

- Is it possible to use other options of PS 21 if one of the options fails? Are the 4 options ranked by severity?

Answer

- Yes
- The 4 options are not ranked by severity. Option 4 is a test of the type design as installed.

Clarifications – PS 21 Bonded Details – Double Sided Tapes

- Can double sided tapes be tested at their thickness rather than plied up to ¼" per PS 21, option 1 (which was intended for paste type adhesives)?

Answer

- Yes

Clarifications – PS 21 Bonded Details – Single Sided Tapes

- Are single sided tapes treated as bonded details?

Answer

- Yes, tapes can be substantiated using PS 21 options 3 or 4.

Clarifications – PS 21 Bonded Details – Integral Adhesive

- Can materials with integral adhesive (PSA) use PS21?
- Can single sided tapes and other materials with integral adhesives (gaskets, etc.) be tested alone and the substrate tested separately?

Answers

- Yes, using options 3 or 4.
- Not per the Policy Statement, but Option 3 is an effective method of compliance

Clarifications – PS 21 Bonded Details – Hook and Loop

- Hook and Loop tapes tend to be an issue when trying to show compliance per Option 3 or 4. Can we test them separate from a panel?

Answer

- No, Nylon hook and loop tapes can fail vertical burn when applied to a substrate, which is why Options 1 and 2 are not allowed for use with hook and loop tape materials. They must be tested on a substrate.

Clarifications – PS 21 Bonded Details – Thin laminate

- As the thin laminate in Option 3 was envisioned as a 2 ply fiberglass laminate (nominal 0.010" per ply), is it acceptable to use a 2 ply laminate that is slightly over 0.02" because of slight variances in the manufacturing process.

Answer

- Yes, a laminate with a nominal thickness of 0.02" is acceptable.

Test the specific detail bonded to a thin laminate at a thickness of 0.02" or less (considered worst case) in accordance with appendix F, part I (a)(1)(ii). Once qualified in this manner, the detail/adhesive combination may be bonded to other substrates without further test. Data substantiates the bonded detail/adhesive combination on any substrate. Test data on the minimum thickness of the detail substantiates any thicker detail of the same material.

Clarifications – PS 21 Bonded Details –¼” Thick Plaque

- PS 21 Option 1 references PS 23 Option 1 for the plaque size for the adhesive to be tested alone. What is the tolerance on the thickness? Can thinner plaques be used (1/8”, etc.)?

Answer

- No, standard is ¼” with a nominal tolerance

Clarifications – PS 21 Bonded Details –¼” Thick Plaque

- PS 21 Option 1 references PS 23 Option 1 for the plaque size for the adhesive to be tested alone. How should spray adhesives and contact cements be handled as building up a ¼” thick specimen is impractical?

Answer

- Use options 2, 3 or 4 for spray adhesives.

Clarifications – PS21 Intimate Contact of Materials

- Can PS21 be used to substantiate materials to 25.853(a) which are in intimate contact ?

Answer

- PS21 applies to bonded details.

Clarifications – PS 21 Bonded Details – Bonded Metal

- In bonded details where a metal part that varies in thickness is required to meet heat release and smoke, what thickness should be tested?

Answer

- This is outside of the policy Statement and doesn't change past practice in this area. Assuming only the metal is varying in thickness (not the coating, decorative, etc.), testing the thinnest nominal cross section of the metal would be appropriate (thinnest has the least heat sink).

Clarifications – PS 23 Edge Potting – Assembly Test

- What is an actual assembly (representative of type design) tested to, 60 or 12 second vertical burn?

Answer

- When testing an assembly that represents a panel edge type design, PS 23 does not apply and the part should be tested to its applicable requirement.

Clarifications – PS 24 Bonded Joints – Standard Panel

- PS 24 Options 3 and 4 reference a "standard panel". Is there a definition for this panel?

Answer

- Per page 27 of the Policy Statement
  Standard Panel - A panel with one or two-ply non-metallic skins, nominally 6.35 to 13 mm (0.25" - 0.51") thick non-metallic honeycomb core, which meets 14 CFR 25.853(a), Appendix F, Part 1(a)(1)(i). [60-sec VBB]

Clarifications – PS 24 Bonded Joints – Multi-Ditch & Pot

- Can PS 24 be used to show compliance for multi-ditch and pot panels?
- Can a six cut D&P certify a three cut D&P for heat release and smoke?

Answer

- Yes for vertical burn
- There are no MOCs noted for ditch and pot for 14 CFR 25.853(d)

Clarifications – PS 27 Backside Decorative Treatment

- Does a test plan have to differentiate between paint and decorative on the backside to use PS27?

Answer

- Yes, the Test Plan/Report must note the panel construction (all layers, including the backside decor) and the construction of the part for which the data is being used to show compliance.

Clarifications – PS 27 Backside Decorative Treatment

- Is PS27 applicable to ¼" or less panels for vertical burn compliance?

Answer

- Yes

Clarifications – General Veneer and Leather

- Does every batch of veneer and leather have to be tested for certification?

Answer

- This is outside the Policy Statement.

Clarifications – General
Use with AC-178

- Can the Policy Statement MOCs be used with AC 20-178 (repair of old materials)?

Answer

- Yes

Clarifications – PS 27 Back side Decorative – Powder Coat

- For Policy Statement MOC 27, is powder coating considered a paint?

Answer

- Yes

Questions?