



Flammability Standardization Task Group

“Flammability Testing of Interior Materials”

PS-ANM-25.853-01

Overview and Application

Michael Jensen & Scott Campbell (Industry Team Co-Leaders)

Jeff Gardlin (FAA Transport Standards Staff)

IAMFTWG

October 17, 2012 Revised 11/20/2012

Indianapolis, IN

Flammability Policy Statement, PS-ANM-25.853-01

Agenda:

- Background
- Overview
- Cross-reference to Draft Policy
- Policy Clarifications
- Definitions
- General MoCs
- Item Review and Examples
- Combining MoCs
- Special Condition Applicability
- Citing Policy Statement in Compliance Test Plans/Reports

Flammability Policy Statement, PS-ANM-25.853-01

Background:

- 1) FAA released flammability draft policy in 2009.
- 2) Industry team was initiated to validate methods of compliance (Oct 2009).
- 3) Some applicants received an Issue Paper to use draft policy while the industry team completed validation effort.
- 4) Industry team completed 2-year effort and submitted final reports & recommendations to FAA in April 2012 (DOT/FAA/TC-12/10).
- 5) Policy Statement released August 16, 2012. Content is similar to the industry recommendations.
- 6) Methods of compliance have changed from draft policy:
 - a. Changes range from renumbering to substantial technical content.
 - b. Key definitions defined.
 - c. Standardized test configurations and options defined.
 - d. Requires different/new showings, different/new testing.
 - e. Policy Statement shall be used on new programs.

Flammability Policy Statement, PS-ANM-25.853-01

Policy Statement and Draft Policy Cross-Reference Table

| Policy Statement Line Item | Policy Statement Feature / Construction | Draft Policy Line Item |
|----------------------------|--|------------------------|
| 1 | Panels, general | 1 |
| 2 | Material vs. installation | 27 |
| 3 | Thickness ranges (panels, thermoplastics, foams) | 2, 24 |
| 4 | Core, density | 3 |
| 5 | Core, cell size/shape | 4 |
| 6 | Skin ply layup - orientation | 8 |
| 7 | Paint color | 5a |
| 8 | Decorative laminate color | 5b, 12 |
| 9 | Thermoplastic, elastomers and decorative non-textile floor coverings color | 23 |
| 10 | Skin testing (FASE - Face As Separate Entity) | 9 |
| 11 | Backside decorative treatment (See Line Item 27) | 11 |
| 11 | Decorative texture | 13 |
| 12 | Decorative laminate orientation | 14 |
| 13 | Synthetic leather/suede | 15 |
| 14 | Aluminum/steel/titanium parts (excluding powder coating) | 16 |
| 15 | Powder coated metal | 17 |

| Policy Statement Line Item | Policy Statement Feature / Construction | Draft Policy Line Item |
|----------------------------|---|--|
| 16 | Embedded metal detail | 20 |
| 17 | Edge trim, metal (including metal joint covers) | 21 |
| 18 | Doubler, metal, co-cured | 22 |
| 19 | Clear plastic windows and signs | 25 |
| 20 | Printed wiring boards (PWB) | 26 |
| 21 | Bonded details | 28, 29, 30, 31, 32, 34, 35 37, 38, 39 40, 41 |
| 22 | Surfacing materials (pin-hole filler, sweep and sand, Bondo) | 10 |
| 23 | Edge potting and/or edge foam | 33 |
| 24 | Bonded joints (ditch & pot, cut & fold, tab & slot, mortise & tenon, T-joints, bonded pins) | 43a - f |
| 25 | Bonded inserts | 42 |
| 26 | Sealant, fillet seals | 44 |
| 27 (Orig PS 11 Pt. 1) | Backside decorative treatment | 11 |

Flammability Policy Statement, PS-ANM-25.853-01

Changes and Impacts from Draft Policy to Policy Statement

Table is intended as reference only and does not capture all changes & impacts from the Draft Policy to the Policy Statement.

| Policy Statement Line Item | Policy Statement Feature / Construction | Draft Policy Line Item | Changes from Draft Policy to Policy Statement | Impacts (Relative to Draft Policy) |
|----------------------------|--|------------------------|--|---|
| 1 | Panels, general | 1 | None | None or minimal |
| 2 | Material vs. installation | 27 | None | None or minimal |
| 3 | Thickness ranges (panels, thermoplastics, foams) | 2, 24 | <ul style="list-style-type: none"> • Adds definition of "same." • 25.853(d): Standardizes thickness ranges for sandwich panels, thermoplastics, foam sheet. • 25.853(d): Adds 0.040" (1 mm) moving range. | <ul style="list-style-type: none"> • Changes impact 25.853(d) only. • Significant difference in defined thickness ranges. • May require add'l testing at upper & lower limits of ranges. • Does not cover foam panels with pre-preg facesheets. |
| 4 | Core, density | 3 | <ul style="list-style-type: none"> • Adds definition of "same." • Defines standard honeycomb core types. | None or minimal |
| 5 | Core, cell size/shape | 4 | <ul style="list-style-type: none"> • Adds definition of "same." • Requires data be within standard thickness ranges. • Defines standard honeycomb core types. | <ul style="list-style-type: none"> • 25.853(a): May require add'l testing within specific ranges defined in PS 3. • 25.853(d): May require add'l testing for upper & lower limits of PS 3 thickness ranges. |
| 6 | Skin ply layup - orientation | 8 | <ul style="list-style-type: none"> • Adds definition of "same." | None or minimal |
| 7 | Paint color | 5a | <ul style="list-style-type: none"> • Adds definition of "same" for paint chemistry. • 25.853(d): Adds 55/55/180 margins for similarity. | <ul style="list-style-type: none"> • Definition of "same" may cause add'l testing if optional paint products are defined on Type Design. • Must validate 25.853(d) data meet new margins. |
| 8 | Decorative laminate color | 5b, 12 | <ul style="list-style-type: none"> • Adds definitions of "decorative laminate color" and "same." | <ul style="list-style-type: none"> • Restricted to the "same decorative laminate chemistry" which may require add'l testing if optional decorative laminates are defined on Type Design. |
| 9 | Thermoplastic, elastomers and decorative non-textile floor coverings color | 23 | <ul style="list-style-type: none"> • Adds definition of "same." • 25.853(d): Adds 55/55/180 margins for similarity. • Requires data on same thickness. | <ul style="list-style-type: none"> • May require add'l testing to meet "same thickness." • 25.853(d): Data must meet margins. |
| 10 | Skin testing (FASE - Face As Separate Entity) | 9 | None | None or minimal |

Flammability Policy Statement, PS-ANM-25.853-01

Changes and Impacts from Draft Policy to Policy Statement

NOTE: Table is intended as reference only and does not purport to capture all changes & impacts, major or minor, from the Draft Policy to the Policy Statement.

| Policy Statement Line Item | Policy Statement Feature / Construction | Draft Policy Line Item | Changes from Draft Policy to Policy Statement | Impacts (Relative to Draft Policy) |
|----------------------------|--|------------------------|--|---|
| 11 | Decorative texture | 13 | <ul style="list-style-type: none"> • Adds definition of "same." | None or minimal |
| 12 | Decorative laminate orientation | 14 | <ul style="list-style-type: none"> • Adds definition of "same." | None or minimal |
| 13 | Synthetic leather/suede | 15 | <ul style="list-style-type: none"> • Adds definition of "same." • 25.853(a): Applies only to Tapis Ultraleather™ and E-Leather Group Superlight™ products. | <ul style="list-style-type: none"> • 25.853(a): Applies only to products from Tapis & E-Leather Group. • 25.853(d): Similarity not available--must test each color. |
| 14 | Aluminum/steel/titanium parts (excluding powder coating) | 16 | <ul style="list-style-type: none"> • Adds criterion that metal alloys may not contain >10% Mg. | <ul style="list-style-type: none"> • 25.853(d): Test requirement based on size criteria. |
| 15 | Powder coated metal | 17 | <ul style="list-style-type: none"> • Adds criterion that metal alloys may not contain >10% Mg. | <ul style="list-style-type: none"> • 25.853(d): Testing required for each color of power coating. |
| 16 | Embedded metal detail | 20 | <ul style="list-style-type: none"> • Adds criterion that metal alloys may not contain >10% Mg. • Adds minimum thickness (? 0.01") requirement for no test. | <ul style="list-style-type: none"> • 25.853(a): No testing req'd if conditions are met. • 25.853(d): No testing required. |
| 17 | Edge trim, metal (including metal joint covers) | 21 | <ul style="list-style-type: none"> • Adds minimum thickness (? 0.02") requirement for no test. | <ul style="list-style-type: none"> • 25.853(a): No testing req'd if conditions are met. • 25.853(d): No testing required. |
| 18 | Doubler, metal, co-cured | 22 | <ul style="list-style-type: none"> • Adds criterion that metal alloys may not contain >10% Mg. • Adds minimum thickness (? 0.01") requirement for no test. | <ul style="list-style-type: none"> • 25.853(a): No testing req'd if conditions are met. • 25.853(d): No testing required. |
| 19 | Clear plastic windows and signs | 25 | None | None or minimal |
| 20 | Printed wiring boards (PWB) | 26 | <ul style="list-style-type: none"> • Adds definition of "same." • 25.853(a): Adds restriction that "thin for thick" applies only for same laminate and conformal coating mat'ls. | <ul style="list-style-type: none"> • May require add'l testing on "same laminate." • Differences in copper tracing are acceptable. |

Flammability Policy Statement, PS-ANM-25.853-01

Changes and Impacts from Draft Policy to Policy Statement

Table is intended as reference only and does capture all changes & impacts from the Draft Policy to the Policy Statement.

| Policy Statement Line Item | Policy Statement Feature / Construction | Draft Policy Line Item | Changes from Draft Policy to Policy Statement | Impacts (Relative to Draft Policy) |
|----------------------------|---|--|---|--|
| 21 | Bonded details | 28, 29, 30, 31, 32, 34, 35 37, 38, 39 40, 41 | <u>25.853(a)</u> • Requires data on adhesive using 1 of the 4 test options. <u>25.853(d)</u> • Provides testing exemption for certain geometrical conditions. | <u>25.853(a)</u> • May require add'l testing. • Confirm that existing data on adhesives meets 1 of the 4 PS test options. |
| 22 | Surfacing materials (pin-hole filler, sweep and sand, Bondo®) | 10 | • Adds requirement that application process spec must establish threshold quantity of surfacing mat'l which does not impact flammability properties. | • General process for establishing threshold limits defined in industry report (DOT/FAA/TC-12/10, Appendix J, Section 5). • Process specification must be approved. |
| 23 | Edge potting and/or edge foam | 33 | • Adds definition of "standard panel." <u>25.853(a)</u> • Provides 2 options for compliance. • Test configurations are defined in PS reference document FAA/DOT/TC-12/10. <u>25.853(d)</u> • Provides testing exemption for certain geometrical condition. | • May require add'l testing to satisfy compliance test options. |
| 24 | Bonded joints (ditch & pot, cut & fold, tab & slot, mortise & tenon, T-joints, bonded pins) | 43a - f | <u>25.853(a)</u> • Diagrammatically defines joint types. • Provides 5 options for compliance. <u>25.853(d)</u> • No testing req'd for DAP if exposed adhesive <1" wide & single-cut. • No testing req'd for other joint types. | <u>25.853(a)</u> • May require add'l testing to satisfy compliance test options. • Confirm that existing data on adhesives meets 1 of the 4 PS test options. |

Flammability Policy Statement, PS-ANM-25.853-01

Changes and Impacts from Draft Policy to Policy Statement

Table is intended as reference only and does not capture all changes & impacts from the Draft Policy to the Policy Statement.

| Policy Statement Line Item | Policy Statement Feature / Construction | Draft Policy Line Item | Changes from Draft Policy to Policy Statement | Impacts (Relative to Draft Policy) |
|----------------------------|---|------------------------|--|---|
| 25 | Bonded inserts | 42 | <ul style="list-style-type: none"> • 25.853(a)/25.853(d): No testing required if conditions met. • Applies to singly bonded inserts where adhesive is <3x diameter of the insert. • Applies only to localized installations. (No uniform distribution of inserts across entire panel.) | None or minimal |
| 26 | Sealant, fillet seals | 44 | <ul style="list-style-type: none"> • Defines "fillet seal." Applies only to exposed fillet seals. | <ul style="list-style-type: none"> • Does not cover fay seals and gap seals. • Sealants in faying surface interface require compliance using PS 21. |
| 27 (orig. PS 11, Pt. 1) | Backside decorative treatment | 11 | None | None or minimal |

Flammability Policy Statement, PS-ANM-25.853-01

Clarifications Summary Table

| Item | Issue | Accepted Modification or Interpretation |
|------|--|--|
| 8 | Policy wording for 25.853(a) and 25.853(d) is not quite consistent. | Standardize the wording by using the wording from 25.853(d) for both 25.853(a) and 25.853(d): "Testing a part with one color substantiates any other color with the same decorative laminate chemistry." |
| 11 | Duplicate entries for Item 11. | "Backside decorative treatment" becomes Item 27. "Decorative texture" remains Item 11. |
| 14 | Refers to Item 17 for powder coatings (typographical error). | Change powder coatings reference to Item 15. |
| 21 | <ul style="list-style-type: none"> Option 1 - "Test the adhesive by itself" references Item 23. Option 1 in Item 23 was only meant to apply to liquid and paste adhesives and potting compounds. | <ul style="list-style-type: none"> Modify reference to "Item 23, Option 1." Test liquid and paste adhesives per Item 23, Option 1. Test adhesive films and double-sided tapes at the thickness used in the part. |
| 21 | Option 3 – Specifies a laminate thickness of 0.20" (typographical error). | Correct thickness is 0.020". |
| 22 | Bondo is a trademark of the 3M Company. | Note Bondo™ as an official trademark. |
| 23 | Options 1 & 2: Lack flame placement information. | Refer to Appendix Z of FAA report DOT/FAA/TC-12/10. |
| 23 | 25.853(d): Extraneous wording. | Should read, "No test required when edge fill material is less than 1" deep into panel measured from the edge (looking at the panel's face)." |
| 24 | Option 2: "Test a plaque of adhesive by itself" references Item 23. | Modify reference to "Item 23, Option 1." |
| 24 | Option 3: "Figure IV in Figure 4.1" refers to Industry Report. | Refer to Appendix BB of FAA report DOT/FAA/TC-12/10. |
| 24 | Option 4: "Foam Block Test Method defined in Appendix A" refers to Industry Report. | Refer to Appendix BB of FAA report DOT/FAA/TC-12/10. |
| 26 | Definition of "Fillet Seal": "...faying surfaces as a continuous bed of sealing material." | Typographical error. Change "bed" to "bead." |

Flammability Policy Statement, PS-ANM-25.853-01

Technical Definitions Policy Statement (PS-ANM-25.853-01)

1. Bonded Detail (Item 21)
2. Decorative Laminate Color (Item 8)
3. Decorative Laminate (Item 11 & 12)
4. Fillet Seal (Item 26)
5. Joint Types (Item 24)
6. Lineally Applied (Item 21)
7. Same (Multiple Items)
8. Standard Panel (Item 23)
9. Texture (Item 11)

Additional Technical Definitions

- See reference document DOT/FAA/TC-12/10—Appendix A.
 - NOTE: Document is 881 pages and 38 MB.
- Available at <http://www.fire.tc.faa.gov/pdf/tc12-10.pdf>

Flammability Policy Statement, PS-ANM-25.853-01

Clarification of Policy Statement Introductory Material

Policy Statement Excerpt, page 5

“Lastly, the MOCs are based on aerospace materials and processes currently used. Should **new or novel** materials and processes be developed, this policy may be reevaluated to account for any differences in material behavior that would affect these MOCs.”

CLARIFICATION FOR POLICY STATEMENT:

The word “new” has the potential for differences in interpretation. The intended meaning of “new or novel” in the context of the Policy Statement is equivalent to “novel and unusual,” i.e., materials beyond the scope of the data generated to support the policy. The following examples using PS item 8 illustrate where the Policy Statement may, or may not, be used for future changes.

Example 1 (Policy Statement Item 8 can still be applied)

Use of a new decorative laminate fabricated using a PEEK film rather than PVF film, but the multi-laminate and printed ink process remains the same. (Data must still be generated using the new film before color similarity could be used per PS 8 to substantiate the same film with a different color.)

Example 2 (Policy Statement Item 8 cannot be applied)

Use of a photochemical reaction process to create images and color in a decorative laminate. This would be a novel process that has never before been used in industry.

Flammability Policy Statement, PS-ANM-25.853-01

Citing Policy Statement in Compliance Test Plans/Test Reports

The following example illustrates one way to reference the Policy Statement (PS) items within specific compliance reports.

Introductory information:

“FAA Policy Statement PS-ANM-25.853-01

FAA Policy Statement PS-ANM-25.853-01 establishes Methods of Compliance (MOC) for demonstrating compliance to the FAA Bunsen burner, heat release and smoke regulations. Material Test List items that invoke any of these MOCs shall briefly describe and state the MOC reference number as listed in the Policy Statement Attachment 2 using the format "PS xx". It is implied that all other characteristics are the same except as noted in the referenced MOC(s).”

Flammability Policy Statement, PS-ANM-25.853-01

Industry Standard Common MOCs - Preamble for Compliance Reports

For the purposes of standardization and simplification of compliance reports, the industry suggests a common preamble citation for some MOCs in the Policy Statement. Companies should confirm their approach with the local regulatory authority.

When the preamble statements are used, the individual MOCs will not require explicit citation for each material construction in the compliance report. The compliance report should address each item to confirm the design meets the criteria in the MOCs. See the example wording on the next pages.

| Potential Test Plan/Report Preamble MOCs | |
|---|-------------------------------------|
| Policy Statement | MOC Title |
| 6 | Skin Ply Layup – Orientation |
| 11 | Decorative Texture |
| 12 | Decorative Laminate Orientation |
| 14-18 | Metal Items, Max. Magnesium Content |
| 16 | Embedded Metal Detail |
| 17 | Edge Trim, Metal |
| 22 | Surfacing Materials |
| 23 | Edge Potting and/or Edge Foam |
| 24 | Bonded Joints |
| 25 | Bonded Inserts |
| 26 | Sealant, Fillet Seals |

Flammability Policy Statement, PS-ANM-25.853-01

Suggested Preamble Compliance Statements for Flammability Plans/Reports

Examples of compliance report preambles based on Policy Statement MoCs are shown below. These examples may not apply in all cases, and other preamble statements are possible. The 1st paragraph below and subsequent applicable preamble statements would follow the introductory preamble paragraph as suggested on page 12 of this presentation.

“The panel features cited in the following sub-paragraphs are common to most panel constructions used in assemblies represented by this document. Compliance for each of these features is shown here rather than for each individual panel in Material Test List.”

“Skin Ply Orientation(PS 6) and Decorative Orientation (PS 12) -
Honeycomb/foam panels, laminates and decorative laminates are tested in one orientation and all other test orientations are shown compliant per PS 6 and PS 12. “

Flammability Policy Statement, PS-ANM-25.853-01

Suggested Preamble Compliance Statements for Flammability Plans/Reports (cont.)

“Decorative Texture (PS 11) - Decorative laminates used are shown compliant by similarity to decorative laminates with the same construction, but potentially different colors and textures. Differences in texture have no appreciable effect and are shown compliant per PS 11.”

Embedded Metal Details (PS 16) – Embedded metal details are greater than 0.01” thick and are shown compliant per PS 16.

“Metal Edge Trim (PS 17) - Metal edge trims are greater than 0.02” thick and are shown compliant per PS 17.”

“Surfacing Materials (PS 22) – Panel surfacing materials *“material x”*, *“material y”*, etc., are used as required when authorized per released engineering. These materials are applied per process specification *“specification z”*. These materials and application requirements have been determined to have no appreciable effect on flammability as required per PS 22, and; therefore, are not included on the test specimens.”

Flammability Policy Statement, PS-ANM-25.853-01

Suggested Preamble Compliance Statements for Flammability Plans/Reports (cont)

“Edge Potting (PS 23, Option 1) – “Adhesive or foam name and manufacturer or specification” is used as an edge fill to a depth of less than 1” (measured from the panel edge). The edge fill is shown compliant by testing a .25” thick plaque per Appendix F, Part 1, (a)(1)(ii) per PS 23, Option 1. Data, conformity and test witness documentation are shown on pages ____ to ____.”

NOTE: The first time this MOC is used, the data will have to be generated, so the edge fill material would need to be listed in the Table of items to test. Use of Option 2 would be similar to the above, except referencing the testing of a panel with the edge fill (or foam) to Appendix F, Part 1, (a)(1)(i), 60-second vertical burn.

Flammability Policy Statement, PS-ANM-25.853-01

Suggested Preamble Compliance Statements for Flammability Plans/Reports (cont.)

“Bonded Joint Constructions (PS 24 Option 1) - Sandwich panel adhesive bonded joint constructions include _____ and _____ joints. The adhesive bonded joints utilize epoxy adhesive “product name or specification call out”, the base panels meet the 60-second vertical Bunsen burner test requirements and there is no exposed adhesive in the final joint configuration beyond squeeze-out/fillet seal and are; therefore, shown compliant per PS 24, Option 1. Base panel 60-second Vertical Bunsen burner requirements are identified in the Material Test List.”

NOTE: Outside DAP joints need to be shown compliant using another option.

“Bonded Inserts (PS 25) - Bonded inserts are individually potted, the diameter of the adhesive/potting is no more than 3 times the diameter of the insert as controlled in process specification “Specification Z” or on the individual engineering drawings, are installed in localized areas and do not have a large uniform distribution over the entire panel surface and; therefore, are shown compliant per PS 25.”

Flammability Policy Statement, PS-ANM-25.853-01

“Sealant, fillet seal (PS 26) - Fillet seals are applied after assembly of panels at the junction of two adjoining parts or surfaces, or along the edges of faying surfaces as a continuous bead of sealing material or are formed as a result of squeeze-out from a bonded joint and; therefore, are shown compliant per PS 26.”

“PS Items 14 – 18: Metals Compliance Statement - Magnesium Content
All aluminum, titanium, and steel alloys contain less than 10% magnesium; therefore, the magnesium content for each metal part utilizing PS 14 – 18 is not cited in the Materials Test List.”

NOTE: MOCs 14 - 18 will need to be cited for individual materials and constructions when confirming metal thickness requirements.

Flammability Policy Statement, PS-ANM-25.853-01

Definition of “Same”

[PS] Same - Use of the term “the same” means the only differences between compared materials/constructions are those properties defined by the one or more MOCs that are being applied (e.g., color of decorative and/or thickness of material). Materials that are qualified to the same type, class, grade, etc. of a specification that controls the physical, chemical and, in particular, flammability properties are considered the same for the purposes of the comparison. Decorative laminates and synthetic leather, because of their inherent, unique to the manufacturer, multi-material constructions, cannot be considered “the same” based on their qualification to the same specification type, class, grade etc. These materials must be from the same manufacturer and product line to be considered the same.

Flammability Policy Statement, PS-ANM-25.853-01

Examples of “Same”

Example 1

Phenolic prepregs from two different manufacturers qualified to the same type, class, grade, etc of a material specification that controls the physical (e.g., tensile and compression strength), chemical (Phenolic resin system) and flammability (meets a specified level of vertical burn and or heat release and smoke) properties can be considered the same when comparing two sandwich panel constructions to show compliance for a change in decorative color and texture as shown below:

Compliant Panel

..... SkyFlite 140 series dec, Cream Color 1643, Mesa Texture, by SkyFilm LLC

1 Ply DMS 2296 Type 1, Class 1 prepreg
XXXXXXXXXXXXX 0.5” DMS 1974 Type 3, Class 2, Grade A core

1 Ply DMS 2296 Type 1, Class 1 prepreg

Panel to be shown compliant by similarity

..... SkyFlite 140 series dec, Blue Color 2387, Canvas texture, by SkyFilm LLC

1 Ply DMS 2296 Type 1, Class 1 prepreg
XXXXXXXXXXXXX 0.5” DMS 1974 Type 3, Class 2, Grade A core

1 Ply DMS 2296 Type 1, Class 1 prepreg

The only differences between the two items being compared are the MOCs being applied, Decorative Color, and Decorative Texture. The base panels are considered the “same” regardless of which source of material was purchased to the prepreg and honeycomb specifications.

Example 2

When comparing two thermoplastic sheet materials, one vinyl-based and one polycarbonate-based, they cannot be considered the same even if they meet the same type, class and grade of a specification because they are not of the same chemical family, even if they have the same strength and flammability characteristics.

PS 1
DP 1

Flammability Policy Statement, PS-ANM-25.853-01

Cross-Reference and Change Level:
PS – Policy Statement
DP – Draft Policy

TEMPLATE

Excerpt from Policy Statement

Change from Draft Policy
Minimal

Item 1 “Panels, general”

Highlighting of wording changes from draft policy

| Reference Number | Feature / Construction | 25.853(a) Bunsen Burner Test Requirement/Similarity | 25.853(d) Heat Release and Smoke Test Requirement/Similarity |
|------------------|------------------------|--|---|
| 1 | Panels, general | 60-second vertical Bunsen burner test data will substantiate configurations that only require 12-second vertical Bunsen burner data. Vertical Bunsen burner test data will substantiate configurations that only require horizontal Bunsen burner testing. | Test requirement is decided based on size criteria. ¹ 1) Test required if greater than 2 sq ft, 2) No test if less than 1 sq ft, and 3) Specific determination required between 1 and 2 sq ft. |

CLARIFICATION FOR POLICY STATEMENT:

Use equivalent wording from 25.853(d) for 25.853(a): “Testing a part with one color substantiates any other color with the same decorative laminate chemistry.”

NOTE: Key information described.

Applicable Footnotes from Policy Statement

1 As a general rule, components with exposed-surface areas of one square foot or less may be considered small enough that they do not have to meet the standards of § 25.853(d). Components with exposed-surface areas greater than two square feet may be considered large enough that they do have to meet these standards. Those with exposed-surface areas greater than one square foot, but less than two square feet, must be considered in conjunction with the areas of the cabin in which they are installed. From the final rule *Improved Flammability Standards for Materials Used in the Interiors of Transport Category Airplane Cabins* (60 FR 6616, February 2, 1995).

Clarifications to Policy Statement

Other key information provided.

Item 1

“Panels, general”

Change from Draft Policy
Minimal

| Reference Number | Feature / Construction | 25.853(a) Bunsen Burner Test Requirement/Similarity | 25.853(d) Heat Release and Smoke Test Requirement/Similarity |
|------------------|------------------------|--|--|
| 1 | Panels, general | 60-second vertical Bunsen burner test data will substantiate configurations that only require 12-second vertical Bunsen burner data. Vertical Bunsen burner test data will substantiate configurations that only require horizontal Bunsen burner testing. | Test requirement is decided based on size criteria. ¹ 1) Test required if greater than 2 sq ft, 2) No test if less than 1 sq ft, and 3) Specific determination required between 1 and 2 sq ft. |

¹ As a general rule, components with exposed-surface areas of one square foot or less may be considered small enough that they do not have to meet the standards of § 25.853(d). Components with exposed-surface areas greater than two square feet may be considered large enough that they do have to meet these standards. Those with exposed-surface areas greater than one square foot, but less than two square feet, must be considered in conjunction with the areas of the cabin in which they are installed.

From the final rule Improved Flammability Standards for Materials Used in the Interiors of Transport Category Airplane Cabins (60 FR 6616, February 2, 1995).

Item 2

“Material vs. installation”

Change from Draft Policy
Minimal

| Reference Number | Feature / Construction | 25.853(a) Bunsen Burner Test Requirement/Similarity | 25.853(d) Heat Release and Smoke Test Requirement/Similarity |
|------------------|------------------------------|---|---|
| 2 | Material versus installation | <p>The criteria based on installation overrides the test method applicable to the material. For instance, carpet is substantiated using the 12-second Bunsen burner test unless the carpet is installed on the sidewall. Then it is tested as part of the sidewall using the 60-second Bunsen burner test.</p> <p>Appendix F contains an explicit exception for certain items constructed from elastomeric materials.</p> | Not applicable - the requirement is <u>based on</u> the installation, not the material. |

Appendix F refers to 14CFR Part 25, Appendix F.

A common example is carpeting with a large surface area used on a side wall panel. This configuration would require compliance using a 60-second vertical Bunsen burner test instead of the 12-second test. Heat release and smoke testing may also be required.

Flammability Policy Statement, PS-ANM-25.853-01

Item 3 “Thickness ranges (panels, thermoplastics, foams)”

| Reference Number | Feature / Construction | 25.853(a) Bunsen Burner Test Requirement/Similarity | 25.853(d) Heat Release and Smoke Test Requirement/Similarity | | | | | | | | | | | | | | | | | | |
|--|---|--|--|----------------------------|---------------------------------------|----------------------------------|--|---------------------------------|--|-------------------------------|---|--------------------------------|--|----------------------------------|---|-----------------------------------|---|--|---------------------------|--|--|
| 3 | <p>Change from Draft Policy High</p> <p>Thickness ranges (panels, thermoplastics, foams)</p> | <p>Data from testing a thinner construction substantiates a thicker construction made of the same materials.</p> | <p>Except for foam core panels with prepreg facesheets — where each thickness must be tested, the following approach is acceptable:</p> <table border="1" data-bbox="1296 461 1731 1286"> <thead> <tr> <th>Part or material thickness</th> <th>Thicknesses tested to show compliance</th> </tr> </thead> <tbody> <tr> <td>0.02 - 0.06 inch 0.5 - 1.5 mm</td> <td>0.02 inch & 0.06 inch or 0.5 mm & 1.5 mm</td> </tr> <tr> <td>0.06 - 0.1 inch 1.5 - 2.5 mm</td> <td>0.06 inch & 0.1 inch or 1.5 & 2.5 mm</td> </tr> <tr> <td>0.1 - 0.25 inch 2.5 - 6 mm</td> <td>0.1 inch & 0.25 inch or 2.5 mm & 6 mm</td> </tr> <tr> <td>0.25 - 0.5 inch 6 - 12.5 mm</td> <td>0.25 inch & 0.5 inch or 6 mm & 12.5 mm</td> </tr> <tr> <td>0.5 - 1.0 inch 12.5 - 25.5 mm</td> <td>0.5 inch & 1.0 inch or 12.5 mm & 25.5 mm</td> </tr> <tr> <td>1.0 - 1.75 inch 25.5 - 44.5 mm</td> <td>1.0 inch & 1.75* inch or 25.5 mm & 44.5* mm</td> </tr> <tr> <td>1.75 inch & thicker 44.5 mm & thicker</td> <td>1.75* inch or 44.5* mm</td> </tr> <tr> <td colspan="2">* 1.75 inch or 44.5 mm specimens are not tested for smoke.</td> </tr> </tbody> </table> | Part or material thickness | Thicknesses tested to show compliance | 0.02 - 0.06 inch 0.5 - 1.5 mm | 0.02 inch & 0.06 inch or 0.5 mm & 1.5 mm | 0.06 - 0.1 inch 1.5 - 2.5 mm | 0.06 inch & 0.1 inch or 1.5 & 2.5 mm | 0.1 - 0.25 inch 2.5 - 6 mm | 0.1 inch & 0.25 inch or 2.5 mm & 6 mm | 0.25 - 0.5 inch 6 - 12.5 mm | 0.25 inch & 0.5 inch or 6 mm & 12.5 mm | 0.5 - 1.0 inch 12.5 - 25.5 mm | 0.5 inch & 1.0 inch or 12.5 mm & 25.5 mm | 1.0 - 1.75 inch 25.5 - 44.5 mm | 1.0 inch & 1.75* inch or 25.5 mm & 44.5* mm | 1.75 inch & thicker 44.5 mm & thicker | 1.75* inch or 44.5* mm | * 1.75 inch or 44.5 mm specimens are not tested for smoke. | |
| Part or material thickness | Thicknesses tested to show compliance | | | | | | | | | | | | | | | | | | | | |
| 0.02 - 0.06 inch 0.5 - 1.5 mm | 0.02 inch & 0.06 inch or 0.5 mm & 1.5 mm | | | | | | | | | | | | | | | | | | | | |
| 0.06 - 0.1 inch 1.5 - 2.5 mm | 0.06 inch & 0.1 inch or 1.5 & 2.5 mm | | | | | | | | | | | | | | | | | | | | |
| 0.1 - 0.25 inch 2.5 - 6 mm | 0.1 inch & 0.25 inch or 2.5 mm & 6 mm | | | | | | | | | | | | | | | | | | | | |
| 0.25 - 0.5 inch 6 - 12.5 mm | 0.25 inch & 0.5 inch or 6 mm & 12.5 mm | | | | | | | | | | | | | | | | | | | | |
| 0.5 - 1.0 inch 12.5 - 25.5 mm | 0.5 inch & 1.0 inch or 12.5 mm & 25.5 mm | | | | | | | | | | | | | | | | | | | | |
| 1.0 - 1.75 inch 25.5 - 44.5 mm | 1.0 inch & 1.75* inch or 25.5 mm & 44.5* mm | | | | | | | | | | | | | | | | | | | | |
| 1.75 inch & thicker 44.5 mm & thicker | 1.75* inch or 44.5* mm | | | | | | | | | | | | | | | | | | | | |
| * 1.75 inch or 44.5 mm specimens are not tested for smoke. | | | | | | | | | | | | | | | | | | | | | |

Note that the smallest thickness range shown is 0.04” (1 mm). Using this minimum range, it is acceptable to qualify thicknesses with different minimum and maximum values. So, data for two thicknesses 0.04” apart can be used to substantiate any thicknesses in between, regardless of the absolute thickness.

Item 3

“Thickness ranges (panels, thermoplastics, foams)”

Applicable Definitions

[PS] Same - Use of the term “the same” means the only differences between compared materials/constructions are those properties defined by the one or more MOCs that are being applied (e.g., color of decorative and/or thickness of material). Materials that are qualified to the same type, class, grade, etc. of a specification that controls the physical, chemical and, in particular, flammability properties are considered the same for the purposes of the comparison. Decorative laminates and synthetic leather, because of their inherent, unique to the manufacturer, multi-material constructions, cannot be considered “the same” based on their qualification to the same specification type, class, grade etc. These materials must be from the same manufacturer and product line to be considered the same.

Flammability Policy Statement, PS-ANM-25.853-01

25.853(a) Substantiation Methods

Example 1 – “Thin for Thick” (less than 0.25”)

New Part Construction
Requiring a Showing of Compliance

Existing Test Data

- _____ 0.2” thermoplastic X
- _____ Adhesive Z
- _____ 4 plies of prepreg

- _____ 0.1” thermoplastic X
- _____ Adhesive Z
- _____ 4 plies of prepreg

Acceptable: Existing data of the same part construction is available. A thinner part construction can be tested to show compliance for a thicker construction of the same material [14CFR 25.853(a)].

NOTE: Constructions ≤ 0.25 ” need only be tested from one face (both the test data and new part constructions must be 0.25” or less).

Flammability Policy Statement, PS-ANM-25.853-01

25.853(a) Substantiation Methods

Example 2 – “Thin for Thick” (less than 0.25”)

New Part Construction
Requiring a Showing of Compliance

Existing Test Data

————— Identical blue paint
===== 4 plies of prepreg A

————— Blue Paint
===== 2 plies of prepreg A

Acceptable: The thinner 2 ply laminate with blue paint may be used to substantiate the thicker 4 ply laminate made from the same prepreg with the same color paint.

Flammability Policy Statement, PS-ANM-25.853-01

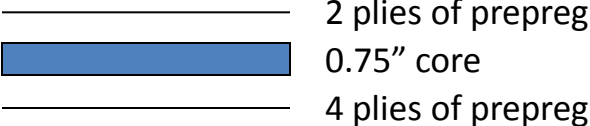
25.853(d) Substantiation Methods

Example 3 – Using the Defined Thickness Range Table

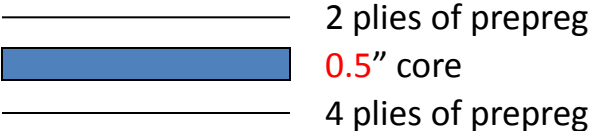
New Part Construction
Requiring a Showing of Compliance

Existing Test Data

Exposed Side

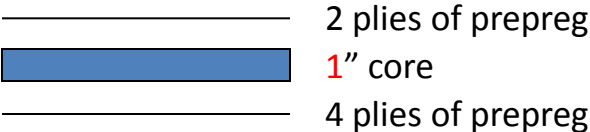


Test Side



| Part or material thickness | Thicknesses tested to show compliance |
|----------------------------------|---|
| 0.5 – 1.0 inch 12.5 – 25.5 mm | 0.5 inch & 1.0 inch or 12.5 mm & 25.5 mm |

Test Side



Acceptable: Data exist for the same construction at both the minimum and maximum limits of a specific thickness range. These two data points allow substantiation of any thickness within the range for 14CFR 25.853(d).

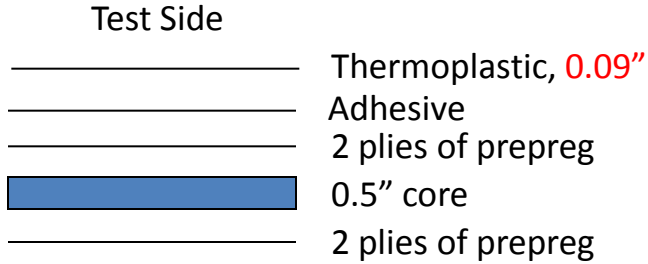
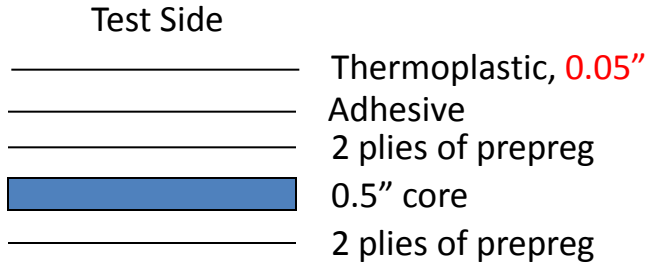
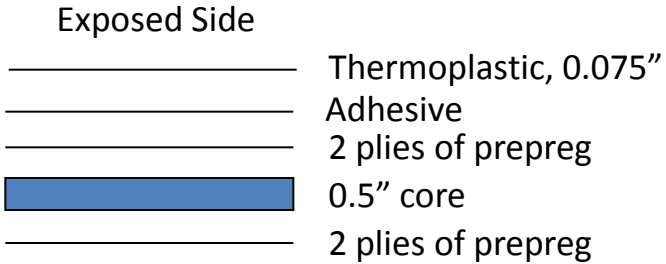
Flammability Policy Statement, PS-ANM-25.853-01

25.853(d) Substantiation Methods

Example 4 – Using the 0.04” Moving Range

New Part Construction
Requiring a Showing of Compliance

Existing Test Data



Acceptable: Although the existing data are not within one of the thickness ranges explicitly specified in the Policy Statement, the thickness of the new thermoplastic is within a 0.04” range of the existing data. These two sets of existing data allow substantiation of the new construction for 14CFR 25.853(d).

Flammability Policy Statement, PS-ANM-25.853-01

25.853(d) Substantiation Methods

Example 5 – Outside Thickness Ranges

New Part Construction
Requiring a Showing of Compliance

Existing Test Data



Thermoplastic, 0.063"



Thermoplastic, 0.03"



Thermoplastic, 0.075"

Not Acceptable: This example is not acceptable because the thermoplastic test data are outside a defined thickness range and exceed the 0.04" moving range.

Item 4

“Core, density”

Change from Draft Policy
Minimal

| Reference Number | Feature / Construction | 25.853(a) Bunsen Burner Test Requirement/Similarity | 25.853(d) Heat Release and Smoke Test Requirement/Similarity |
|------------------|------------------------|--|--|
| 4 | Core, density | Data from testing a lower density honeycomb core substantiates a higher density honeycomb core of the same material, provided the core is made from phenolic aramid (e.g., Nomex® and Kevlar®, paper, phenolic fiberglass, or aluminum). | Data from testing a core’s lightest and heaviest densities substantiates all densities in between for a given core material. |

Applicable Definitions

[PS] Same - Use of the term “the same” means the only differences between compared materials/constructions are those properties defined by the one or more MOCs that are being applied (e.g., color of decorative and/or thickness of material). Materials that are qualified to the same type, class, grade, etc. of a specification that controls the physical, chemical and, in particular, flammability properties are considered the same for the purposes of the comparison. Decorative laminates and synthetic leather, because of their inherent, unique to the manufacturer, multi-material constructions, cannot be considered “the same” based on their qualification to the same specification type, class, grade etc. These materials must be from the same manufacturer and product line to be considered the same.

Item 5

“Core, cell size/shape”

Change from Draft Policy
Moderate

| Reference Number | Feature / Construction | 25.853(a) Bunsen Burner Test Requirement/Similarity | 25.853(d) Heat Release and Smoke Test Requirement/Similarity |
|------------------|------------------------|---|---|
| 5 | Core, cell size/shape | Data from testing any core cell size/shape within a specific thickness range substantiates other core cell sizes/shapes of the same material, provided the core is made from phenolic aramid (e.g., Nomex® and Kevlar®) paper, phenolic fiberglass, or aluminum). | Data from testing a core’s smallest and largest cell sizes within a specific thickness range substantiates all cell sizes in between. |

NOTE: The thickness range criteria from PS 3 apply here.

Applicable Definitions

[PS] Same - Use of the term “the same” means the only differences between compared materials/constructions are those properties defined by the one or more MOCs that are being applied (e.g., color of decorative and/or thickness of material). Materials that are qualified to the same type, class, grade, etc. of a specification that controls the physical, chemical and, in particular, flammability properties are considered the same for the purposes of the comparison. Decorative laminates and synthetic leather, because of their inherent, unique to the manufacturer, multi-material constructions, cannot be considered “the same” based on their qualification to the same specification type, class, grade etc. These materials must be from the same manufacturer and product line to be considered the same.

Item 6

“Skin ply layup - orientation”

Change from Draft Policy
Minimal

| Reference Number | Feature / Construction | 25.853(a) Bunsen Burner Test Requirement/Similarity | 25.853(d) Heat Release and Smoke Test Requirement/Similarity |
|------------------|------------------------------|---|---|
| 6 | Skin ply layup - orientation | Data from testing one panel construction substantiates any orientation of the skin plies for the same panel construction. | Data from testing one panel construction substantiates any orientation of the skin plies for the same panel construction. Data from testing a skin buildup is valid for use in any orientation of the same skin ply materials. |

Item 7 “Paint color”

Change from Draft Policy
Moderate


| Reference Number | Feature / Construction | 25.853(a) Bunsen Burner Test Requirement/Similarity | 25.853(d) Heat Release and Smoke Test Requirement/Similarity |
|------------------|------------------------|--|---|
| 7 | Paint color | Testing a part with one color substantiates other colors of the same paint chemistry. Additionally, testing a painted part substantiates an unpainted part with the same construction. | Testing a part with one color substantiates any other color with the same paint chemistry, provided the peak and total heat release measurement are 55 KW/m ² , and 55 KW-min/m ² or below, respectively and specific optical density D _s is no more than 180. Additionally, testing a painted part with those limitations substantiates an unpainted part with the same construction. Parts with higher heat release values may also be used to substantiate unpainted parts, if the paint is known to increase heat release. |


Substantiation Methods

Example 1

New Part Construction
Requiring a Showing of Compliance

Existing Test Data


_____ .2" black polycarbonate
White paint, Product A*


_____ .2" black polycarbonate
Blue paint, Product A*

* Same paint chemistry, from
same supplier & product line

60-Sec Bunsen = Passing
HR = 43/27 (Margin 55/55)
DS = 148 (Margin 180)

Acceptable: Existing test data support similarity analysis for 25.853(a) and (d). Test data only differ in paint color and numbers meet margins for 14CFR 25.853(d). If margins are not met, testing of the new construction is required.

Item 8 “Decorative laminate color”

Change from Draft Policy
Minimal

| Reference Number | Feature / Construction | 25.853(a) Bunsen Burner Test Requirement/Similarity | 25.853(d) Heat Release and Smoke Test Requirement/Similarity |
|------------------|----------------------------|--|--|
| 8 | Decorative Laminate color* | Test the part with same chemistry paint/ink system. Testing one color substantiates other colors of the same paint/ink system. | Testing a part with one color substantiates any other color with the same decorative laminate chemistry. |

CLARIFICATION FOR POLICY STATEMENT:

Use equivalent wording from 25.853(d) for 25.853(a): “Testing a part with one color substantiates any other color with the same decorative laminate chemistry.”

CLARIFICATION FOR POLICY STATEMENT:

“Fibrous” in the definition of decorative laminate (see next page) refers to textile decoratives (tapestries, carpets, etc.). “Non-fibrous” does not refer to reinforced decorative laminates.

Item 8

“Decorative laminate color”

Applicable Definitions

[PS] Decorative Laminate Color - The complete visual appearance of a decorative laminate, including base color, prints, pearl effects, text, images, pattern or design. Color is the result of combinations of pigments in the embossing resin, pigments in the plastic film layers, and printing inks on a surface layer. Inks used in decorative laminates are typically a liquid containing a mixture of various pigments and other ingredients (such as solvents, resins, lubricants) used for printing on a thin surface layer to produce an image, text or design.

[PS] Decorative Laminate: A polymer-based, non-fibrous, single- or multilayer, thin-gage, non-self-supporting decorative sheet that typically contains at least one layer of a fluoropolymer-based film material. (Decorative laminates are always applied to the surface of a part, and therefore never form self-supporting parts. Decorative laminates are typically used on surfaces of sidewalls, lavatories, galleys, closets, linings, partitions, bin doors, and ceilings. Other words used within the industry for the term decorative laminate are Tedlar[®], Decorative Tedlar[®] Laminate, declam, Airdec[®], Panlam[®], AerFilm[®], Flexdec[®], Décor, and Decorative Film.)

[PS] Same - Use of the term “the same” means the only differences between compared materials/constructions are those properties defined by the one or more MOCs that are being applied (e.g., color of decorative and/or thickness of material). Materials that are qualified to the same type, class, grade, etc. of a specification that controls the physical, chemical and, in particular, flammability properties are considered the same for the purposes of the comparison. Decorative laminates and synthetic leather, because of their inherent, unique to the manufacturer, multi-material constructions, cannot be considered “the same” based on their qualification to the same specification type, class, grade etc. These materials must be from the same manufacturer and product line to be considered the same.

Item 9

“Thermoplastic, elastomers and decorative non-textile floor coverings color”

Change from Draft Policy
Moderate

| Reference Number | Feature / Construction | 25.853(a) Bunsen Burner Test Requirement/Similarity | 25.853(d) Heat Release and Smoke Test Requirement/Similarity |
|------------------|--|--|---|
| 9 | Thermoplastic, elastomers and decorative non-textile floor coverings color | Data from testing an integrally colored material substantiates the same material type and thickness for a different color. | Data from testing an integrally colored thermoplastic substantiates the same thickness thermoplastic of a different color, provided the peak and total heat release measurement are 55 KW/m ² and 55 KW-min/m ² or less, respectively, and specific optical density D _s is no more than 180. |

Applicable Definitions

[PS] Same - Use of the term “the same” means the only differences between compared materials/constructions are those properties defined by the one or more MOCs that are being applied (e.g., color of decorative and/or thickness of material). Materials that are qualified to the same type, class, grade, etc. of a specification that controls the physical, chemical and, in particular, flammability properties are considered the same for the purposes of the comparison. Decorative laminates and synthetic leather, because of their inherent, unique to the manufacturer, multi-material constructions, cannot be considered “the same” based on their qualification to the same specification type, class, grade etc. These materials must be from the same manufacturer and product line to be considered the same.


Non-textile Flooring (NTF) – A polymer-based, non-carpet floor covering, typically used in lavatories, galleys and entryways due to their resistance to liquids and durability.


25.853(d) Substantiation Methods

Example: Thermoplastic color change of same material

New Part Construction
Requiring a Showing of Compliance

Existing Test Data

 Blue thermoplastic, .02"

 Red thermoplastic, .015"

HR = 48/41 (Margin 55/55)

DS = 120 (Margin 180)

 Green thermoplastic, .03"

HR = 43/27 (Margin 55/55)

DS = 148 (Margin 180)

Not Acceptable: Using data from one color of a thermoplastic to substantiate another color of the same thermoplastic material must be generated on the same thickness of material. In this example, data generated on any color at a thickness of 0.02" can substantiate the blue thermoplastic at a thickness of 0.02" (provided the peak and total heat release measurements meet the margin requirements of the MOC).

Flammability Policy Statement, PS-ANM-25.853-01

Item 10

“Skin testing (FASE – Face As Separate Entity)”

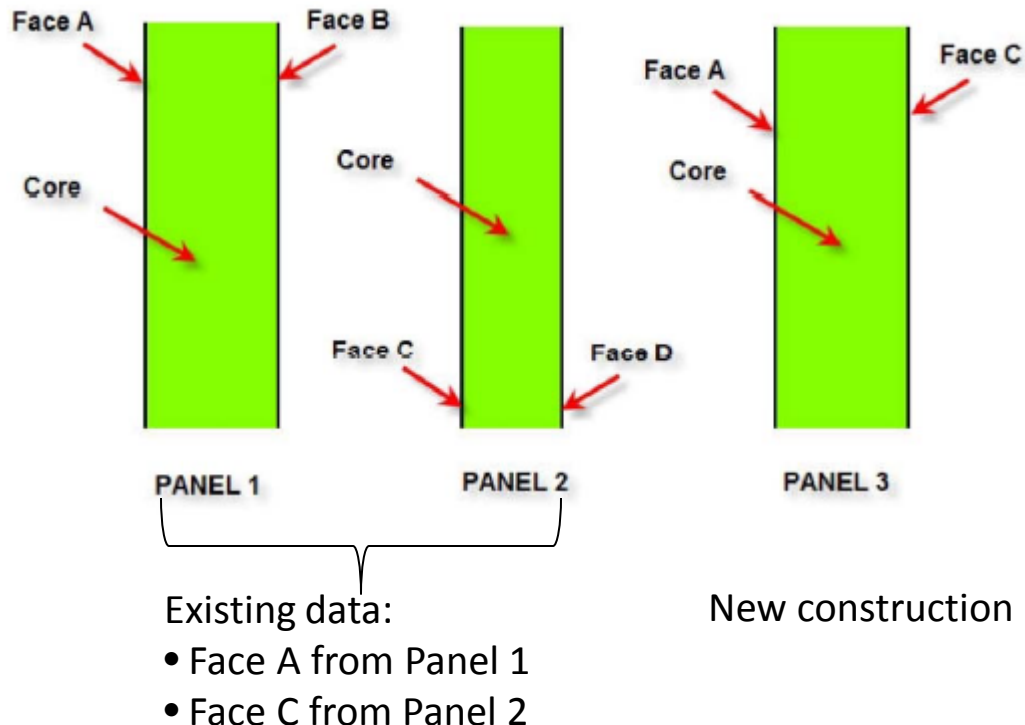
Change from Draft Policy
Minimal

| Reference Number | Feature / Construction | 25.853(a) Bunsen Burner Test Requirement/Similarity | 25.853(d) Heat Release and Smoke Test Requirement/Similarity |
|------------------|---|---|--|
| 10 | Skin testing (FASE - Face As Separate Entity) | <p>Data may be collected from each face of a sandwich panel independently when the panel thickness is greater than 0.25" and the thickness is the only difference between the core materials.</p> <p>NOTE: The test coupon is a completed sandwich panel.</p> | Not applicable. |

Flammability Policy Statement, PS-ANM-25.853-01 Item 10

“Skin testing (FASE – Face As Separate Entity)”

Example of Policy Statement Usage



Acceptable: Certification data from Face A (Panel 1) and Face C (Panel 2) can be used to substantiate Panel 3 as long as:

- the core material for Panels 1, 2, and 3 is the same, and
- the thickness of each panel is >0.25.”

Flammability Policy Statement, PS-ANM-25.853-01

Item 11 “Decorative texture”

Change from Draft Policy
Minimal

| Reference Number | Feature / Construction | 25.853(a) Bunsen Burner Test Requirement/Similarity | 25.853(d) Heat Release and Smoke Test Requirement/Similarity |
|------------------|------------------------|--|--|
| 11 | Decorative texture* | Data from testing one texture of a decorative type substantiates a panel with the same decorative type with a different texture. | Data from testing one texture of a decorative type substantiates a panel with the same decorative type that has a different texture. |

CLARIFICATION FOR POLICY STATEMENT:

Policy Statement contains two “Reference Number 11.”

- First PS-11: “Backside decorative treatment” becomes “Reference Number 27.”
- Second PS-11: “Decorative texture” remains as “Reference Number 11.”

Flammability Policy Statement, PS-ANM-25.853-01

Item 11

“Decorative texture”

Applicable Definitions

[PS] Same - Use of the term “the same” means the only differences between compared materials/constructions are those properties defined by the one or more MOCs that are being applied (e.g., color of decorative and/or thickness of material). Materials that are qualified to the same type, class, grade, etc. of a specification that controls the physical, chemical and, in particular, flammability properties are considered the same for the purposes of the comparison. Decorative laminates and synthetic leather, because of their inherent, unique to the manufacturer, multi-material constructions, cannot be considered “the same” based on their qualification to the same specification type, class, grade etc. These materials must be from the same manufacturer and product line to be considered the same.

[PS] Texture - The physical surface structure of a Decorative Type created by a mechanical transfer tool. Texture is a physical characteristic of a surface. It describes the way a surface feels to touch. Texture influences the physical surface structure and appearance of a decorative type. It does not change the build-up or chemical composition of the finished product.

[PS] Decorative Laminate: A polymer-based, non-fibrous, single- or multilayer, thin-gage, non-self-supporting decorative sheet that typically contains at least one layer of a fluoropolymer-based film material. (Decorative laminates are always applied to the surface of a part, and therefore never form self-supporting parts. Decorative laminates are typically used on surfaces of sidewalls, lavatories, galleys, closets, linings, partitions, bin doors, and ceilings. Other words used within the industry for the term decorative laminate are Tedlar®, Decorative Tedlar® Laminate, declam, Airdec®, Panlam®, AerFilm®, Flexdec®, Décor, and Decorative Film.)

CLARIFICATION FOR POLICY STATEMENT:

“Fibrous” refers to textile decoratives (tapestries, carpets, etc.).

“Non-fibrous” does not refer to reinforced decorative laminates.

Flammability Policy Statement, PS-ANM-25.853-01

Item 12

“Decorative laminate orientation”

Change from Draft Policy
Minimal

| Reference Number | Feature / Construction | 25.853(a) Bunsen Burner Test Requirement/Similarity | 25.853(d) Heat Release and Smoke Test Requirement/Similarity |
|------------------|---------------------------------|---|---|
| 12 | Decorative laminate orientation | Data from testing one decorative laminate orientation substantiates a panel with the same decorative laminate that has a different orientation. | Data from testing one decorative laminate orientation substantiates a panel with the same decorative laminate that has a different orientation. |

[PS] Decorative Laminate: A polymer-based, non-fibrous, single- or multilayer, thin-gage, non-self-supporting decorative sheet that typically contains at least one layer of a fluoropolymer-based film material. (Decorative laminates are always applied to the surface of a part, and therefore never form self-supporting parts. Decorative laminates are typically used on surfaces of sidewalls, lavatories, galleys, closets, linings, partitions, bin doors, and ceilings. Other words used within the industry for the term decorative laminate are Tedlar®, Decorative Tedlar® Laminate, declam, Airdec®, Panlam®, AerFilm®, Flexdec®, Décor, and Decorative Film.)

CLARIFICATION FOR POLICY STATEMENT:

“Fibrous” refers to textile decoratives (tapestries, carpets, etc.). “Non-fibrous” does not refer to reinforced decorative laminates.

Flammability Policy Statement, PS-ANM-25.853-01

Item 13

“Synthetic leather/suede”

Change from Draft Policy
Moderate

| Reference Number | Feature / Construction | 25.853(a) Bunsen Burner Test Requirement/Similarity | 25.853(d) Heat Release and Smoke Test Requirement/Similarity |
|------------------|-------------------------|--|---|
| 13 | Synthetic leather/suede | For Tapis Ultra leather™ and E-Leather Group Superlight™ 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. |

Applicable Definitions

[PS] Same - Use of the term “the same” means the only differences between compared materials/constructions are those properties defined by the one or more MOCs that are being applied (e.g., color of decorative and/or thickness of material). Materials that are qualified to the same type, class, grade, etc. of a specification that controls the physical, chemical and, in particular, flammability properties are considered the same for the purposes of the comparison. Decorative laminates and synthetic leather, because of their inherent, unique to the manufacturer, multi-material constructions, cannot be considered “the same” based on their qualification to the same specification type, class, grade etc. These materials must be from the same manufacturer and product line to be considered the same.

Flammability Policy Statement, PS-ANM-25.853-01 Item 14

“Aluminum/steel/titanium parts (excluding powder coating)”

| Reference Number | Feature / Construction | 25.853(a) Bunsen Burner Test Requirement/Similarity | 25.853(d) Heat Release and Smoke Test Requirement/Similarity |
|------------------|--|---|--|
| 14 | Aluminum/steel/titanium parts (excluding powder coating) | <p>Unfinished metal parts do not require testing, unless they contain more than 10% magnesium.</p> <p>Finished metal parts do not require testing provided:</p> <ol style="list-style-type: none"> 1) standard paint/finishes are used, and 2) the parts do not contain more than 10% magnesium. <p>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 17, below, for powder coatings.</p> | <p>The test requirement is decided based on size criteria. (See footnote 1.)</p> |

Change from Draft Policy
Minimal

CLARIFICATION FOR POLICY STATEMENT:
“Item 17” should read “Item 15.”

¹ As a general rule, components with exposed-surface areas of one square foot or less may be considered small enough that they do not have to meet the standards of § 25.853(d). Components with exposed-surface areas greater than two square feet may be considered large enough that they do have to meet these standards. Those with exposed-surface areas greater than one square foot, but less than two square feet, must be considered in conjunction with the areas of the cabin in which they are installed. From the final rule *Improved Flammability Standards for Materials Used in the Interiors of Transport Category Airplane Cabins* (60 FR 6616, February 2, 1995).

NOTE: Criteria for metallic parts do not apply to parts containing 10% or more magnesium, or if the metal is known to be flammable. The value of 10% is based on differentiating common magnesium-containing alloys with alloys making significant use of magnesium. There are no known alloys in use as interior materials with 10% magnesium. Use of such alloys may be acceptable in certain applications, but must be substantiated.

Flammability Policy Statement, PS-ANM-25.853-01

Item 15

“Powder coated metal”

Change from Draft Policy
Minimal

| Reference Number | Feature / Construction | 25.853(a) Bunsen Burner Test Requirement/Similarity | 25.853(d) Heat Release and Smoke Test Requirement/Similarity |
|------------------|------------------------|---|--|
| 15 | Powder coated metal | Powder coated metal parts do not require testing unless they contain more than 10% magnesium. | Testing each color of powder coating material is required. |

NOTE: Criteria for metallic parts do not apply to parts containing 10% or more magnesium, or if the metal is known to be flammable. The value of 10% is based on differentiating common magnesium-containing alloys with alloys making significant use of magnesium. There are no known alloys in use as interior materials with 10% magnesium. Use of such alloys may be acceptable in certain applications, but must be substantiated.

Flammability Policy Statement, PS-ANM-25.853-01

Item 16

“Embedded metal detail”

Change from Draft Policy
Minimal

| Reference Number | Feature / Construction | 25.853(a) Bunsen Burner Test Requirement/Similarity | 25.853(d) Heat Release and Smoke Test Requirement/Similarity |
|------------------|------------------------|---|--|
| 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. |

NOTE: Criteria for metallic parts do not apply to parts containing 10% or more magnesium, or if the metal is known to be flammable. The value of 10% is based on differentiating common magnesium-containing alloys with alloys making significant use of magnesium. There are no known alloys in use as interior materials with 10% magnesium. Use of such alloys may be acceptable in certain applications, but must be substantiated.

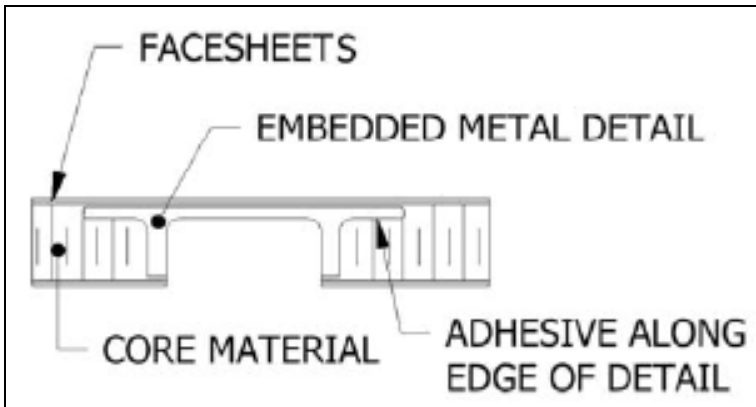
Flammability Policy Statement, PS-ANM-25.853-01

Item 16

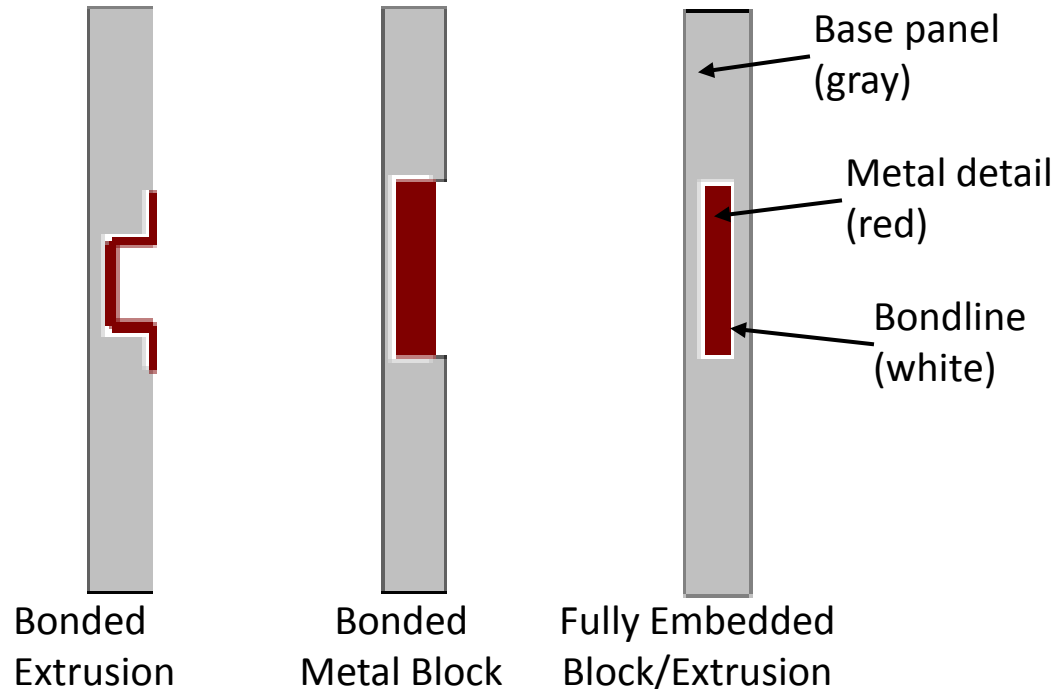
“Embedded metal detail”

Applicable Definitions

Embedded Metal Detail: A metal detail of any shape that is bonded to a sandwich panel, pre- or post-cure of the sandwich panel. Usually, part of the base (stock) sandwich panel is modified by removing core or face sheets before bonding the embedded metal detail to the base panel. Examples of embedded metal details are conduits, fittings, edge supports, attachment fittings, hinges, latches, etc. General cases of bonded metal details are shown in the figure below.



Typical Cross-Section of Embedded Metal Detail



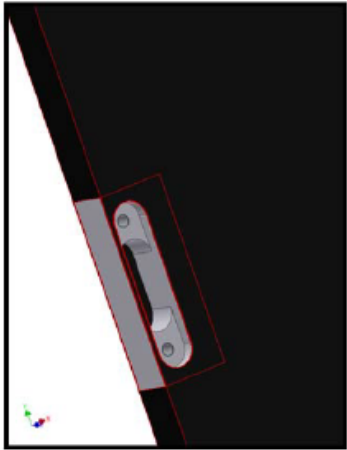
General Cases of Bonded Metal Details
(Detail is bonded to the base panel.)

Flammability Policy Statement, PS-ANM-25.853-01

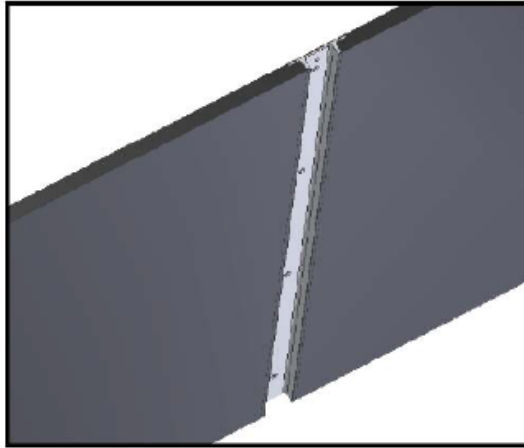
Item 16

“Embedded metal detail”

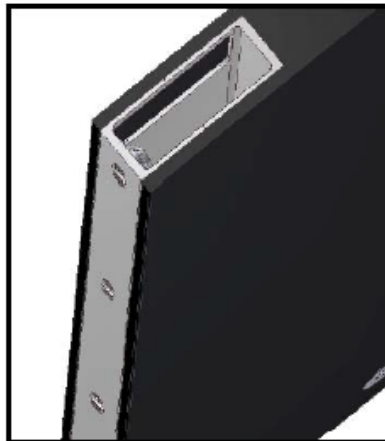
Example Constructions for Embedded Metal Details



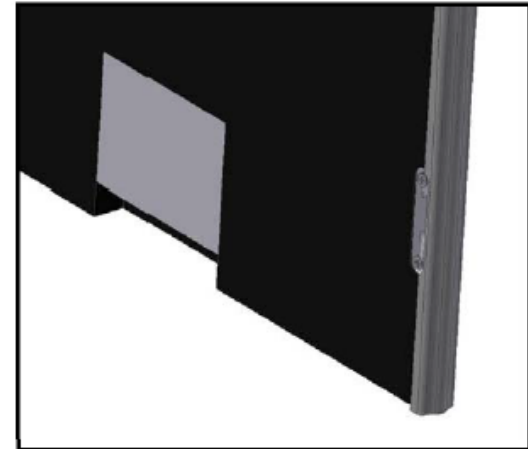
Hinge Block
Bonded to Panel



Bonded Extrusions



Bonded Metal Block



Flammability Policy Statement, PS-ANM-25.853-01

Item 17

“Edge trim, metal (including metal joint covers)”

Change from Draft Policy
Minimal

| Reference Number | Feature / Construction | 25.853(a) Bunsen Burner Test Requirement/Similarity | 25.853(d) Heat Release and Smoke Test Requirement/Similarity |
|------------------|---|--|--|
| 17 | Edge trim, metal (including metal joint covers) | No test required provided edge trim is at least 0.02” thick. | No test requirement. |

Item 17

“Edge trim, metal (including metal joint covers)”

Applicable Definitions

Edge Trim: A molded, extruded, formed, or flat piece of material that is bonded or mechanically fastened to the edge of a panel or a panel joint. The trim may wrap around the edge of the panel(s) or be applied to the cut edge of the panel. Hardwood trim, commonly used as a bullnose, is included in this definition. Edge trim does not extend more than 2” from the edge of the panel.

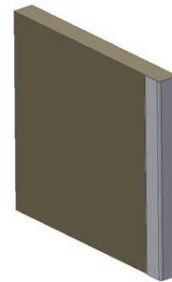
Edge Trims, Metal: Metal trim attached mechanically, by hook-and-loop fasteners, by double-back tape or by adhesive to the edge of a sandwich panel. The metal edge trims can be formed metal, metal extrusions, machined or cast metal. Trim used as joints shall also be considered edge trim, metal.



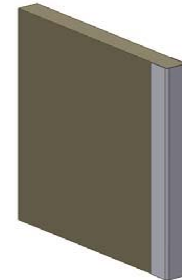
Metal Edge Trim



Joint



L-Shaped
Metal Edge Trim



U-Shaped
Metal Edge Trim

Flammability Policy Statement, PS-ANM-25.853-01

Item 18

“Doubler, metal, co-cured”

Change from Draft Policy
Minimal

| Reference Number | Feature / Construction | 25.853(a) Bunsen Burner Test Requirement/Similarity | 25.853(d) Heat Release and Smoke Test Requirement/Similarity |
|------------------|--------------------------|--|--|
| 18 | Doubler, metal, co-cured | No test requirement. Data from base panel substantiates provided the detail is at least 0.01" thick and is not constructed of more than 10% magnesium. | No test requirement. Data from base panel substantiates. |

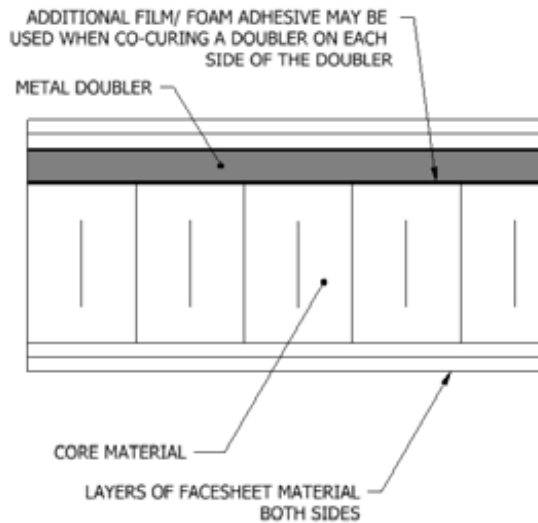
NOTE: Criteria for metallic parts do not apply to parts containing 10% or more magnesium, or if the metal is known to be flammable. The value of 10% is based on differentiating common magnesium-containing alloys with alloys making significant use of magnesium. There are no known alloys in use as interior materials with 10% magnesium. Use of such alloys may be acceptable in certain applications, but must be substantiated.

Item 18

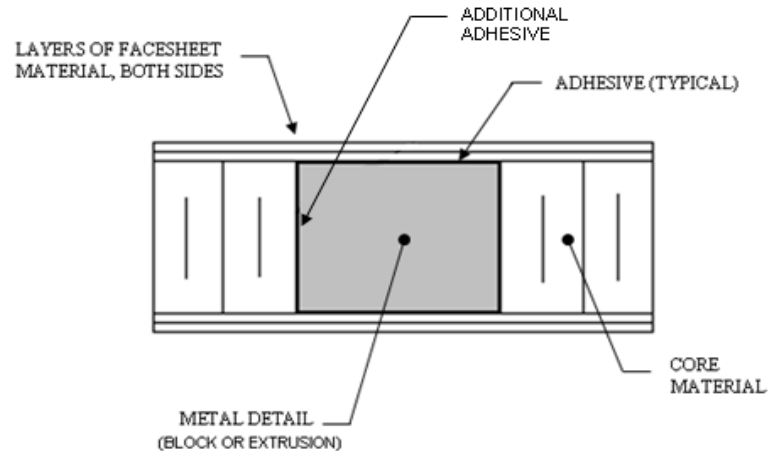
“Doubler, metal, co-cured”

Applicable Definitions

Doubler, Metal, Co-cured: A metal sheet, block, or extrusion co-cured with the composite skin materials. Additional adhesive (usually film adhesive) is typically added to the sandwich panel construction to adhere the doubler to honeycomb and prepreg. Refer to the figures below for a typical cross-section of co-cured sheet metal doubler and a typical cross-section of a co-cured metal block or extrusion.



Co-cured Metal Doubler
Cross Section



Co-cured Metal Doubler
Extrusion Cross Section

Item 19

“Clear plastic windows and signs”

Change from Draft Policy
Minimal

| Reference Number | Feature / Construction | 25.853(a) Bunsen Burner Test Requirement/Similarity | 25.853(d) Heat Release and Smoke Test Requirement/Similarity |
|------------------|---------------------------------|---|--|
| 19 | Clear plastic windows and signs | Test per appendix F, part I, (a)(1)(iv). | No test requirement. |

Flammability Policy Statement, PS-ANM-25.853-01

Item 20

“Printed wiring boards (PWB)”

Change from Draft Policy
Minimal

| Reference Number | Feature / Construction | 25.853(a) Bunsen Burner Test Requirement/Similarity | 25.853(d) Heat Release and Smoke Test Requirement/Similarity |
|------------------|-----------------------------|---|--|
| 20 | Printed wiring boards (PWB) | The test coupons must replicate the PWB laminate; however, the copper tracing may be excluded from the coupon configuration. The test must include the PWB material with solder mask and conformal coating, if a conformal coating is used. Testing of the laminate in the thinnest cross section will substantiate other PWBs with thicker constructions. Made of the same laminate and conformal coating. | No test requirement. |

CLARIFICATION FOR POLICY STATEMENT:

Many draft policy Issue Papers allowed similarity of printed wiring boards (PWB) that were identical except for different copper tracings. The Policy Statement makes the same allowances for similarity for cases in which the only change is in the copper tracings.

Flammability Policy Statement, PS-ANM-25.853-01

Item 20

“Printed wiring boards (PWB)”

Applicable Definitions

(Reference: FAA/DOT/TC-12/10, Appendix A)

Printed Wiring Boards (PWBs): Used to mechanically support and electrically connect electronic components using conductive pathways, tracks or traces etched from copper sheets laminated onto a non-conductive substrate. Also referred to as a printed circuit board (PCB) or an etched wiring board. A PCB populated with electronic components is a printed circuit assembly (PCA), also known as a printed wiring assembly (PWA) or printed circuit board assembly (PCBA).

Copper Tracing: Printed wiring boards (PWB) are made by bonding a layer of copper over the entire bare substrate, sometimes on both sides, (creating a "blank PWB") then removing unwanted copper after applying a temporary mask (e.g. by etching), leaving only the desired copper traces. Some PWBs are made by adding traces to the bare substrate (or a substrate with a very thin layer of copper) usually by a complex process of multiple electroplating steps.

Conformal Coating (CC): Materials applied to electronic circuitry to act as protection against moisture, dust, chemicals, and temperature extremes that if uncoated (unprotected) could result in a failure of the electronic system.

Solder Mask (aka Solder Resist): Lacquer-like layer of polymer that provides a permanent protective coating for the copper traces of a printed circuit board (PCB) and prevents solder from bridging between conductors, thereby preventing short circuits. The solder mask is most often applied with a green tint, but is available in a wide variety of colors and finishes. It also provides some protection from the environment.

Flammability Policy Statement, PS-ANM-25.853-01

PS 21

DP 28, 29, 30, 31, 32, 34, 35, 37,
38, 39, 40, 41

Item 21

“Bonded details”

CLARIFICATION FOR POLICY STATEMENT:

Specify “Item 23, Option 1.”

| Reference Number | Feature / Construction | 25.853(a) Bunsen Burner Test Requirement/Similarity | 25.853(d) Heat Release and Smoke Test Requirement/Similarity |
|------------------|------------------------|--|--|
| 21 | Bonded details* | <p>Unless it can be concluded that the part is small and would not contribute to the propagation of a fire in accordance with appendix F, part I (a)(1)(v), the following four methods of compliance are available to substantiate the bonded construction.</p> <p>OPTION #1: Adhesive, Detail, and Substrate tested separately:</p> <p>Test the adhesive by itself (see item 23) to 12-second Vertical Bunsen Burner (VBB) and separately test the detail and substrate, without adhesive, to the applicable requirements in appendix F, part I (a)(1)(i), (a)(1)(ii) or (a)(1)(iv).</p> <p>NOTE: This MOC is not applicable to hook/loop, placards, or other thin polymer films. These bonded details need to be substantiated using option 3 or 4.</p> <p>NOTE: This MOC is also valid when adhesive is not used and the bonded construction is created from co-curing with a composite panel (e.g., no adhesive).</p> | <p>The test requirement for bonded details is decided based on size and installation/proximity criteria defined below.</p> <p>See footnote 1 for a discussion of the size-based requirement.</p> <p>A bonded detail can be excluded from testing if:</p> <ol style="list-style-type: none"> It is a bond line less than 1.0" wide on an individual item It is located fully within 2.0" of panel edge It is located fully within 4.0" of cabin floor It is lineally* applied and less than 2 sq ft in total surface area on a panel surface. |

Change from Draft Policy High

NOTE: Exclusions to testing for OSU and Smoke have been added for specific types and locations of bonded details.

¹As a general rule, components with exposed-surface areas of one square foot or less may be considered small enough that they do not have to meet the standards of § 25.853(d). Components with exposed-surface areas greater than two square feet may be considered large enough that they do have to meet these standards. Those with exposed-surface areas greater than one square foot, but less than two square feet, must be considered in conjunction with the areas of the cabin in which they are installed. From the final rule *Improved Flammability Standards for Materials Used in the Interiors of Transport Category Airplane Cabins* (60 FR 6616, February 2, 1995).

Flammability Policy Statement, PS-ANM-25.853-01

PS 21

DP 28, 29, 30, 31, 32, 34, 35, 37,
38, 39, 40, 41

Item 21

“Bonded details”

| Reference Number | Feature / Construction | 25.853(a) Bunsen Burner Test Requirement/Similarity | 25.853(d) Heat Release and Smoke Test Requirement/Similarity |
|------------------|------------------------|---|--|
| | | <p><u>OPTION #2:</u> Non-metallic Bonded Construction of specific adhesive: Without adhesive, separately test the detail and substrate to the applicable requirements in appendix F, part I (a)(1)(i), (a)(1)(ii) or (a)(1)(iv), and show compliance of the specific adhesive using data created when two non-metallic materials are bonded together.</p> <p>NOTE: This option is not applicable to hook and loop, placards, or thin films. These bonded details need to be substantiated using option 3 or 4.</p> | |

Flammability Policy Statement, PS-ANM-25.853-01

PS 21

DP 28, 29, 30, 31, 32, 34, 35, 37,
38, 39, 40, 41

Item 21

“Bonded details”

| Reference Number | Feature / Construction | 25.853(a) Bunsen Burner Test Requirement/Similarity | 25.853(d) Heat Release and Smoke Test Requirement/Similarity |
|------------------|------------------------|---|--|
| | | <p>OPTION #3: Specific Detail Bonded to a Worst Case Substrate:</p> <p>Test the specific detail bonded to a thin laminate at a thickness of 0.20" 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.</p> | |

CLARIFICATION FOR POLICY STATEMENT:

Thickness 0.20" should read 0.020".

Flammability Policy Statement, PS-ANM-25.853-01

PS 21

DP 28, 29, 30, 31, 32, 34, 35, 37,
38, 39, 40, 41

Item 21

“Bonded details”

| Reference Number | Feature / Construction | 25.853(a) Bunsen Burner Test Requirement/Similarity | 25.853(d) Heat Release and Smoke Test Requirement/Similarity |
|------------------|------------------------|--|--|
| | | <p><u>OPTION #4: As Installed Configuration</u></p> <p>Test the “as installed” configuration to the applicable requirements in appendix F, part I (a)(1)(i), (a)(1)(ii) or (a)(1)(iv) based on the detail being bonded. If the bonded area of the detail is greater than 2 square feet, test the bonded construction to 60-second VBB.</p> <p>NOTE: If the base panel is over 0.25” thick, the back side would be either tested to the same test requirement, or by using item # 10 (FASE) to the base panel testing.</p> | |

Flammability Policy Statement, PS-ANM-25.853-01

PS 21

DP 28, 29, 30, 31, 32, 34, 35, 37,
38, 39, 40, 41

Item 21

“Bonded details”

Applicable Definitions

[PS] Bonded Detail - A metallic or non-metallic element that is either internal to the panel, or attached to the panel surface or cutout areas/pockets of the panel using adhesive. Types of adhesives include, but are not limited to, epoxies, urethanes, silicones, and pressure sensitive adhesives (PSA). PSAs include double-sided tapes with carriers such as foam and fabric. In some cases bonded details may be co-cured with a composite panel. Bonding hook tape or loop tape individually to a panel is addressed in this policy, but attaching the hook to the loop is not considered, as it is a mechanical attachment method. Typical Bonded Details include, but are not limited to, rub strips, edge trims, hook and loop fasteners, placards, brackets, clips, external wire raceways, kickstrips, felt, doublers, and mirrors. Note that bonded inserts, while technically meeting this definition, have their own MOC, applicable within certain limits.

[PS] Lineally Applied - A bonded detail is considered to be lineally applied when it is a long thin part typically with a width of 2.0” or less and the surface area is spread out in a long, narrow band. Examples of bonded details that commonly meet this definition include, but are not limited to, rub strips/trims, edge trim/non-metallic, exterior wire raceways, felt, kickstrips, metal and plastic bracket, hook and loop fastener, and grommets.

Flammability Policy Statement, PS-ANM-25.853-01

PS 21

DP 28, 29, 30, 31, 32, 34, 35, 37,
38, 39, 40, 41

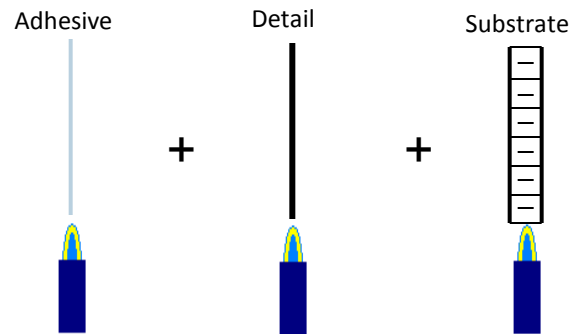
Item 21

“Bonded details”

Examples of Policy Statement Usage – 14CFR 25.853(a)

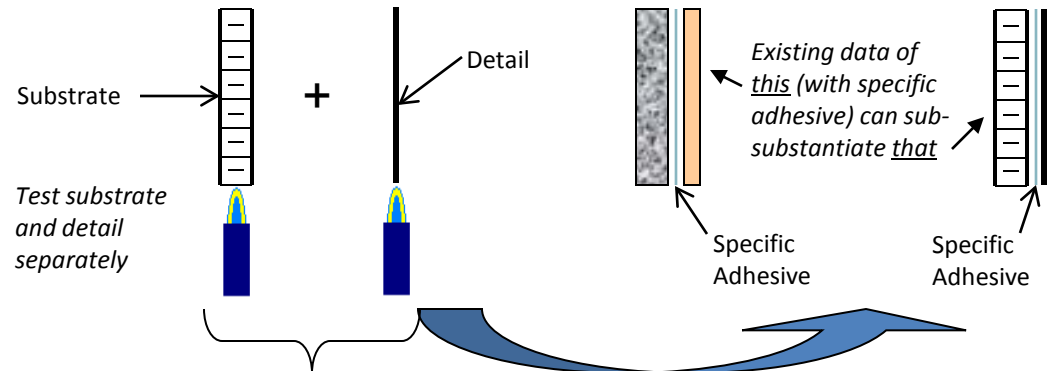
Option 1

Test adhesive, detail,
and substrate separately.



Option 2

Non-metallic bonded construction
of specific adhesive.



Flammability Policy Statement, PS-ANM-25.853-01

PS 21

DP 28, 29, 30, 31, 32, 34, 35, 37,
38, 39, 40, 41

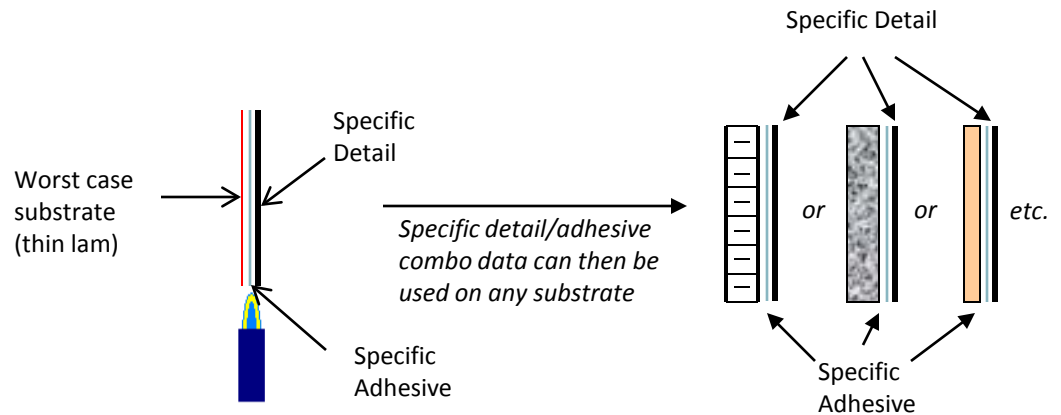
Item 21

“Bonded details”

Examples of Policy Statement Usage – 14CFR 25.853(a)

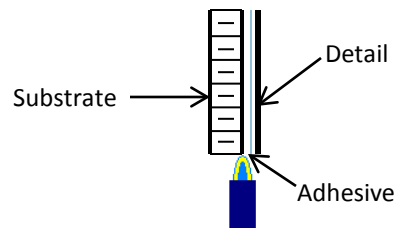
Option 3

Test the specific detail bonded to a worst case (≤ 0.02 ”) substrate (thin laminate) with specific adhesive.



Option 4

Test the as-installed bonded configuration.



Flammability Policy Statement, PS-ANM-25.853-01 Item 22

“Surfacing materials (pin-hole filler, sweep & sand, Bondo®)”

Change from Draft Policy
Moderate

| Reference Number | Feature / Construction | 25.853(a) Bunsen Burner Test Requirement/Similarity | 25.853(d) Heat Release and Smoke Test Requirement/Similarity |
|------------------|--|---|---|
| 22 | Surfacing materials (pin-hole filler, sweep and sand, Bondo) | No test required when surfacing material is controlled within an approved process specification. The process specification must establish the threshold quantity of surfacing material that does not adversely influence flammability properties. | No test required when surfacing material is controlled within an approved process specification. The process specification must establish the threshold quantity of surfacing material that does not adversely influence flammability properties. |

CLARIFICATION FOR POLICY STATEMENT:

Bondo is a registered trademark. Write “Bondo” as “Bondo®”.

CLARIFICATION FOR POLICY STATEMENT:

Establishment of threshold quantities of surfacing materials follows the procedure in reference document DOT/FAA/TC-12/10, Appendix J, Section 5. See description on the following page.

Flammability Policy Statement, PS-ANM-25.853-01

Item 22

“Surfacing materials (pin-hole filler, sweep & sand, Bondo®)”

Reference:
DOT/FAA/TC-12/10,
Appendix J, Section 5

Determining the Acceptable Amount of Surfacing Material that has no Appreciable Effect on Flammability

The following process may be used to determine the amount of surfacing material which has no appreciable effect on flammability. The process must be repeated for each surfacing material and application process. Successful completion of the process will ensure that application of surfacing materials to flammability certification test samples is not required.

1. Manufacture standard panels. (Example: honeycomb sandwich panels with composite skins)
2. Test a minimum of 3 panels of each of the constructions described below. (Engineering data are sufficient--FAA test-witnessing is not required.)
3. Test procedure [25.853(a) & 25.853(d)]
 - Test a set of bare panels with no surfacing materials.
 - Test a set of panels with the maximum amount (weight/area) of surfacing material allowed by the *approved process specification* *.
 - Test at least one set of panels with a density of surfacing material between 0 and the maximum.

Flammability Policy Statement, PS-ANM-25.853-01

4. Determine if panels with the maximum density of surface filler have appreciably different fire properties than the fire properties of bare panels. The maximum density should be shown to be no better or worse than the bare panels.
 - **No Appreciable Difference:** The maximum density of surfacing material is controlled via process specification. Surfacing materials are not required during fabrication of flammability test samples.
 - **Yes, Appreciable Difference:** A new lower maximum density of surfacing material must be determined in order to use the MoC, or flammability test samples must include the surfacing materials at the maximum amount.
5. Before the MOC may be used for certification testing, the data analysis/results/conclusions must be validated (by applicant).

***Approved Process Specification:** An engineering specification or a set of process instructions on the design drawing that define and control the process, such as the application of a surface filler material. The approved process specification or drawing must be released using the approved company procedure for Type Design documents.

Flammability Policy Statement, PS-ANM-25.853-01

Item 23

“Edge potting and/or edge foam”

Change from Draft Policy
Moderate

| Reference Number | Feature / Construction | 25.853(a) Bunsen Burner Test Requirement/Similarity | 25.853(d) Heat Release and Smoke Test Requirement/Similarity |
|------------------|-------------------------------|--|---|
| 23 | Edge potting and/or edge foam | <p>The edge fill in a panel may be shown compliant using one of the following options:</p> <p>OPTION #1: Test a plaque of edge fill material by itself per appendix F, part 1, (a)(1)(ii) (12-second) (Plaque of nominal size: 0.25" x 3" x 12").</p> <p>OPTION #2: Test a standard panel containing the edge fill material per appendix F, part I, (a)(1)(i). (60-second vertical burn). (Standard Panel 3" x 12" with 0.125" to 1" of the edge fill material), configured with the edge fill along the bottom and one vertical edge of the test samples.</p> | <p>No test required when edge fill material less than 1" deep into the panel measured from the edges than 1" is used (looking at the panel's face).</p> |

NOTE:

- Use data for edge fill/edge foam corresponding to the nominal thickness of the process.
- Designs having edge fill/edge foam >1.0" thick cannot use this MoC.

CLARIFICATION FOR POLICY STATEMENT:

Augment Options 1 and 2 with flame placement information as contained in reference document DOT/FAA/TC-12/10, Appendix Z. See figures on next page.

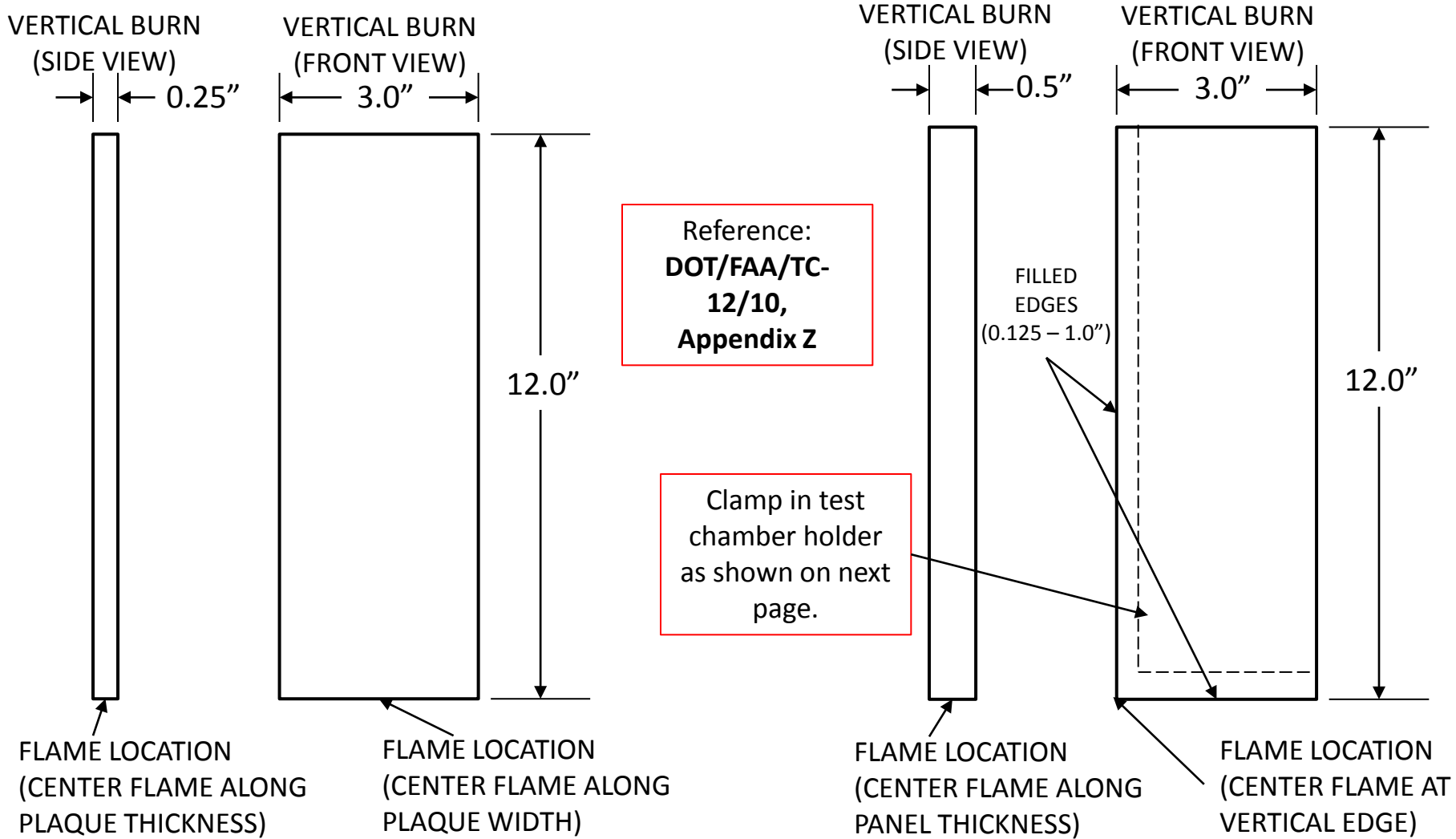
Applicable Definition

[PS] 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]

PS 23
DP 33

Flammability Policy Statement, PS-ANM-25.853-01

Item 23: "Edge potting and/or edge foam"

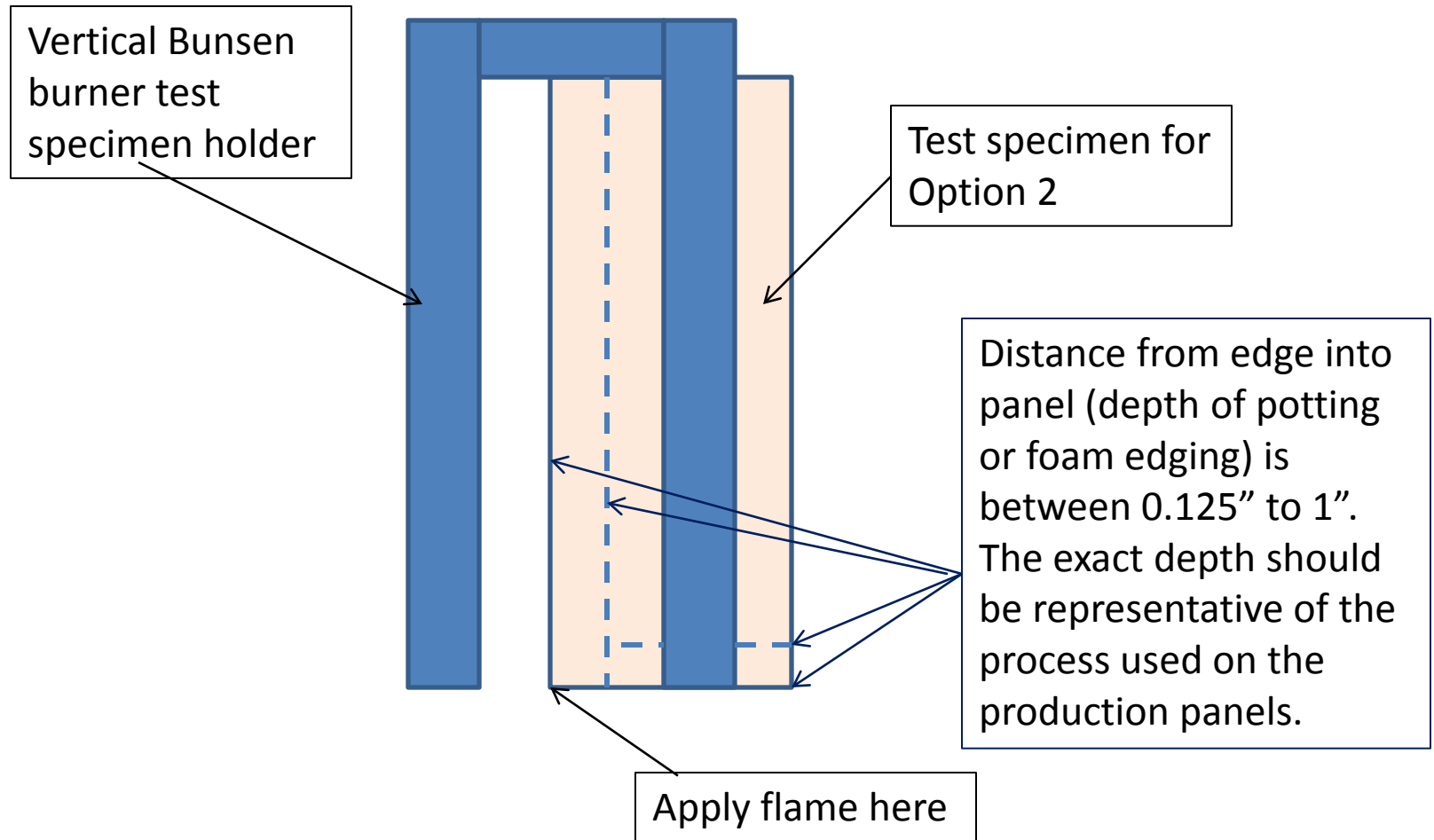


Option 1 Edge Fill Brick (Plaque) Test Configuration

Option 2 Edge Fill Standard Panel Test Configuration

Flammability Policy Statement, PS-ANM-25.853-01

Placement of PS 23, Option 2 Test Specimen in Holder



Flammability Policy Statement, PS-ANM-25.853-01

Item 24

“Bonded joints (ditch & pot, cut & fold, tab & slot, mortise & tenon, T-joints, bonded pins)”

Change from Draft Policy
High

| Reference Number | Feature / Construction | 25.853(a) Bunsen Burner Test Requirement/Similarity | 25.853(d) Heat Release and Smoke Test Requirement/Similarity |
|------------------|--|--|---|
| 24 | Bonded Joints* (Ditch and pot, Cut and fold, Tab and slot, Mortise and tenon, T-joints, Bonded pins) | <p>Compliance of a bonded joint construction can be shown by:</p> <p><u>OPTION #1:</u> similarity to the base panel when the following are met:</p> <ol style="list-style-type: none"> 1) The adhesive is an epoxy-based material 2) The panel is a honeycomb core panel with composite skins meeting § 25.853(a), appendix F, part 1 (a)(1)(i), 60-second VBB, which is the compliance data used for similarity analysis. 3) The exposed adhesive is inside the bent/joined panel (e.g., inside cut) | <p><u>For ditch and pot and cut and fold joints:</u></p> <p>No test requirement, if the exposed adhesive is 1" wide or less and a single cut.</p> <p>If outside this scope then the need for test is decided based on the size criteria-see footnote 1.</p> <p><u>For tab and slot, mortise and tenon, T-joints, bonded pins:</u></p> <p>No test requirement.</p> |

NOTE:

Option 1, Criterion 3 implies no exposed adhesive other than squeeze-out or fillets for all joint types.

¹As a general rule, components with exposed-surface areas of one square foot or less may be considered small enough that they do not have to meet the standards of § 25.853(d). Components with exposed-surface areas greater than two square feet may be considered large enough that they do have to meet these standards. Those with exposed-surface areas greater than one square foot, but less than two square feet, must be considered in conjunction with the areas of the cabin in which they are installed. From the final rule *Improved Flammability Standards for Materials Used in the Interiors of Transport Category Airplane Cabins* (60 FR 6616, February 2, 1995).

Flammability Policy Statement, PS-ANM-25.853-01

Item 24

“Bonded joints (ditch & pot, cut & fold, tab & slot, mortise & tenon, T-joints, bonded pins)”

| Reference Number | Feature / Construction | 25.853(a) Bunsen Burner Test Requirement/Similarity | 25.853(d) Heat Release and Smoke Test Requirement/Similarity |
|------------------|---|--|---|
| | <p>CLARIFICATION FOR POLICY STATEMENT: The 60-second Bunsen burner test is performed as described on the following pages (using the test specimen as shown, regardless of joint type). The test specimen must pass the burn length and drip flame time requirements, but does not have to meet the after flame time requirement.</p> | <p><u>OPTION #2:</u> Test a plaque of adhesive by itself (see item 23) per appendix F, part I,(a)(1)(ii).(12-second)</p> <p><u>OPTION #3:</u> Test the adhesive in a standard honeycomb panel in accordance with appendix F, part I (a)(1)(i); per Figure IV in 4.1 above. Once qualified using this test method, the adhesive may be used in any other honeycomb panel configuration and shown to be compliant by similarity.</p> <p><u>OPTION #4:</u> Test the adhesive in a standard honeycomb panel in accordance with the Foam Block Test Method defined in appendix A and meet the appendix F, part 1 (a)(1)(i) 60-second VBB requirement for burn length and drip extinguishing time. Once qualified using this test method the adhesive may be used in another honeycomb panel configuration and shown compliant by similarity.</p> <p><u>OPTION #5:</u> Test the “as installed” configuration to the applicable requirements in appendix F, part 1(a)(1)(i).</p> <p><u>NOTE:</u> certain parts on seats may only be subject to the 12-second vertical Bunsen burner test.</p> | <p>CLARIFICATION FOR POLICY STATEMENT: Figure IV in 4.1 above appears in reference document DOT/FAA/TC-12/10, Appendix BB, Section 4. See figures on following pages.</p> <p>CLARIFICATION FOR POLICY STATEMENT: Foam Block Test Method is discussed in reference document DOT/FAA/TC-12/10. See Appendix A of Appendix BB. (The full details of the test method should be reviewed and agreed to by the FAA before defining a test program.)</p> |

PS 24
DP 43a-f

Flammability Policy Statement, PS-ANM-25.853-01

Item 24 – Option 3 Test Configuration

“Bonded joints (ditch & pot, cut & fold, tab & slot, mortise & tenon, T-joints, bonded pins)”

Reference:
DOT/FAA/TC-12/10,
Appendix BB
Section 4

Applicable Definition

[PS] 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]

Figure IVA. Inside Joints:

Inside Joint, 90 Degree –Bunsen Burner-

The following specimen construction is used for establishing 60-second vertical Bunsen burner properties of an inside joint. Burn length and drip extinguishing time are recorded. The specimen is fabricated from a standard honeycomb panel with nominal minimum dimensions of 0.25 – 0.50" X 4" x 10". The adhesive joint runs the length of the specimen. The specimen configuration shown below is filled with an adhesive, folded to an angle of 90±5 degrees, and allowed to cure. Photographs of representative test samples are provided. Dimensions are for reference only.

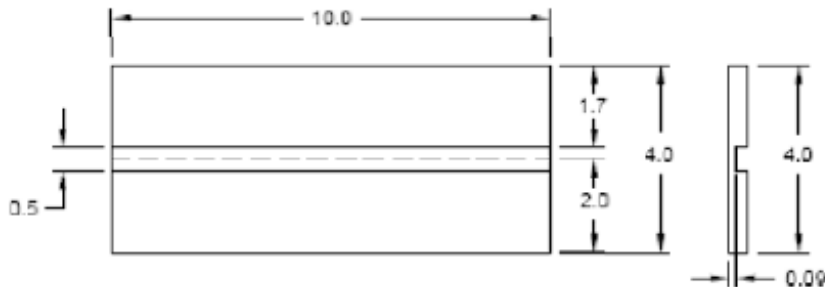


Figure IVC: Flame Placement Centered just below the honeycomb skin

NOTE: Testing of a DAP configuration shows compliance for other joint constructions. Other joint constructions can be tested on both sides.

Flammability Policy Statement, PS-ANM-25.853-01

Item 24 – Option 3 Test Configuration

“Bonded joints (ditch & pot, cut & fold, tab & slot, mortise & tenon, T-joints, bonded pins)”

Reference:
DOT/FAA/TC-12/10,
Appendix BB
Section 4

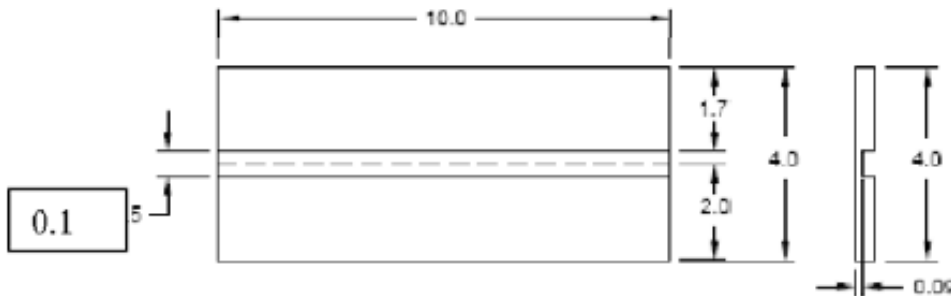
Applicable Definition

[PS] 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]**

Figure IVB. Outside Joints:

Outside Joint, 145 Degree –Bunsen Burner-

The following specimen construction is used for establishing 60-second vertical Bunsen burner properties of an outside joint. Burn length and drip extinguishing time are recorded. The specimen is fabricated from a standard honeycomb panel with nominal minimum dimensions of 0.25 – 0.50" X 4" x 10". The adhesive joint runs the length of the specimen. The specimen configuration is bent to an angle of 145±5 degrees, held in place, the joint filled with adhesive, and allowed to cure. Photographs of representative test samples are provided. Dimensions are for reference only.



NOTE: Testing of a DAP configuration shows compliance for other joint constructions. Other joint constructions can be tested on both sides.

Flammability Policy Statement, PS-ANM-25.853-01

Item 24 – Option 4 Test Configuration, Foam Block

“Bonded joints (ditch & pot, cut & fold, tab & slot, mortise & tenon, T-joints, bonded pins)”

Reference:
DOT/FAA/TC-12/10,
Appendix B of
Appendix BB

This section provides highlights of the foam block test method defined in Appendix BB of DOT/FAA/TC-12/10. The full details of the test method should be reviewed **and agreed to by the FAA** before defining a test program.

5.3.1 Foam Block Test Setup Configurations

• Inside Joint, Horizontal Orientation

All horizontal foam block tests for Inside Joints have been run in the same manner. Figures 5-4 and 5-5 show the location of the foam block relative to the test article.

In the case of severely acute angles, the foam block will be placed as close as possible within the distance shown. It is acceptable for the foam block to be more than 3” away from the ditch-and-pot (DAP) joint in cases where compression of the foam limits the proximity to the DAP joint. In this case, the edges of the foam block will be in contact with the panel. Any instances where the top surface of the foam block is more than 3” from the DAP joint will be noted on the data sheet.

NOTE: Testing of a DAP configuration shows compliance for other joint constructions. Other joint constructions can be tested on both sides.

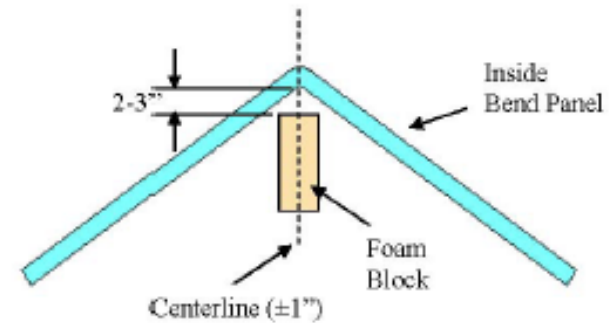


Figure 5-4. Inside Joint Horizontal Test Configuration (Front View)

Flammability Policy Statement, PS-ANM-25.853-01

Item 24 – Option 4 Test Configuration, Foam Block

“Bonded joints (ditch & pot, cut & fold, tab & slot, mortise & tenon, T-joints, bonded pins)”

Reference:
DOT/FAA/TC-12/10,
Appendix B of
Appendix BB

This section provides highlights of the foam block test method defined in Appendix BB of DOT/FAA/TC-12/10. The full details of the test method should be reviewed **and agreed to by the FAA** before defining a test program.

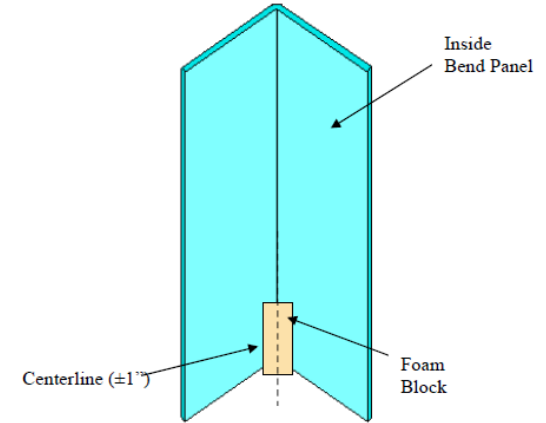


Figure 5-6. Inside Joint 65±5 Test Configuration (Front View)

5.3.1 Foam Block Test Setup Configurations

• Inside Joint, 65±5 Degree Orientation

All 65-degree foam block tests for Inside Joints have been run in the same manner. Figures 5-6, 5-7 & 5-8 show the location of the foam block relative to the test article.

In the case of severely acute angles, the foam block will be placed as close as possible within the distance shown. It is acceptable for the foam block to be more than 3” away from the ditch-and-pot (DAP) joint in cases where compression of the foam limits the proximity to the DAP joint. In this case, the edges of the foam block will be in contact with the panel. Any instances where the top surface of the foam block is more than 3” from the DAP joint will be noted on the data sheet.

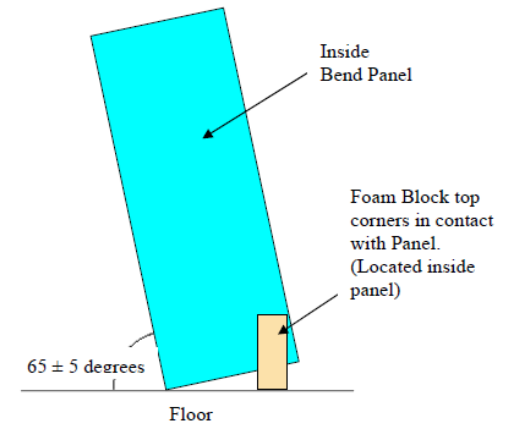


Figure 5-7. Inside Joint 65±5 Test Configuration (Side View)

Flammability Policy Statement, PS-ANM-25.853-01

Item 24 – Option 4 Test Configuration, Foam Block “Bonded joints (ditch & pot, cut & fold, tab & slot, mortise & tenon, T-joints, bonded pins)”

Reference:
DOT/FAA/TC-12/10,
Appendix B of
Appendix BB

This section provides highlights of the foam block test method defined in Appendix BB of DOT/FAA/TC-12/10. The full details of the test method should be reviewed **and agreed to by the FAA** before defining a test program. Standard panel configurations can be used to test both the inside & outside of the joint.

The following procedure has been used for the foam block fire test method:

1. Position test article as defined in the individual test setup sections (See Section 5.3.1)
2. Create a hole down the center of the foam block to be used during testing by sliding it down the length of the rod on the steel tray (See Figure 5-2) and removing it.
3. Measure 10 ml of heptane and pour it into steel soaking tray (See Figure 5-3).
4. Soak up heptane with bottom of the polyurethane foam block.
5. Mount foam block on the steel tray, sliding the block over the pointed steel rod so that the bottom of the block is in contact with the tray (See Figure 5-1).
6. Place the steel tray in test position next to the test article in accordance with the individual test setup sections (See Section 5.3.1). Foam block centerline shall be lined up with the DAP joint. Spacer material may be used as a shop option to meet this dimension.
7. Within 15 minutes of soaking up the heptane with the block, ignite the bottom of the foam block to begin the test.



Figure 5-1.
Foam Block Fire Source

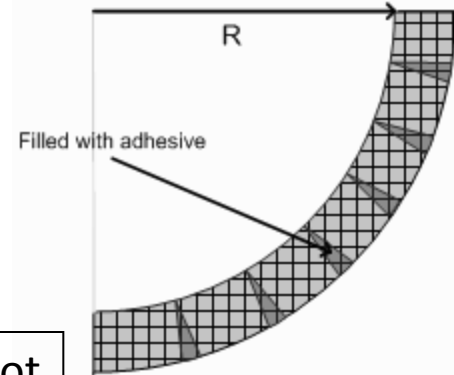
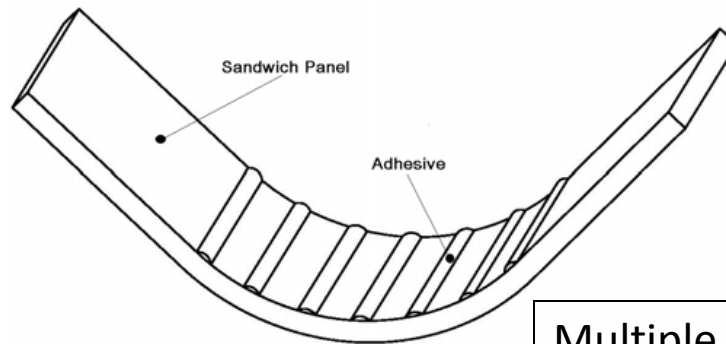
Flammability Policy Statement, PS-ANM-25.853-01 Item 24

“Bonded joints (ditch & pot, cut & fold, tab & slot, mortise & tenon, T-joints, bonded pins)”

Applicable Definitions

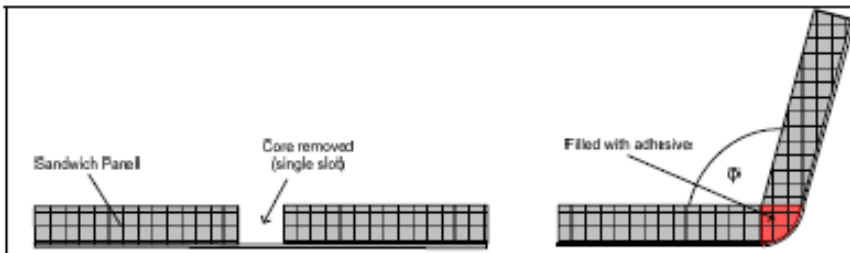
[PS] Joint Types (24) – The following illustrations define Ditch & Pot, Cut & Fold, Mortise & Tenon, Tab & Slot, T-joints, and Bonded Pin joints.

a. Ditch and pot



Multiple Slot

Single Slot



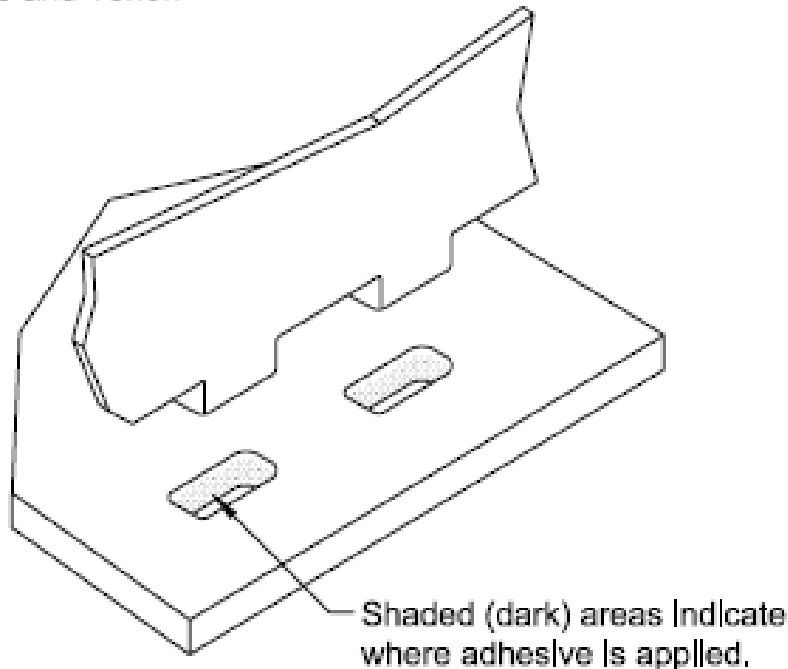
Item 24

“Bonded joints (ditch & pot, cut & fold, tab & slot, mortise & tenon, T-joints, bonded pins)”

Applicable Definitions

[PS] Joint Types (24) – The following illustrations define Ditch & Pot, Cut & Fold, Mortise & Tenon, Tab & Slot, T-joints, and Bonded Pin joints.

b. Tab and slot



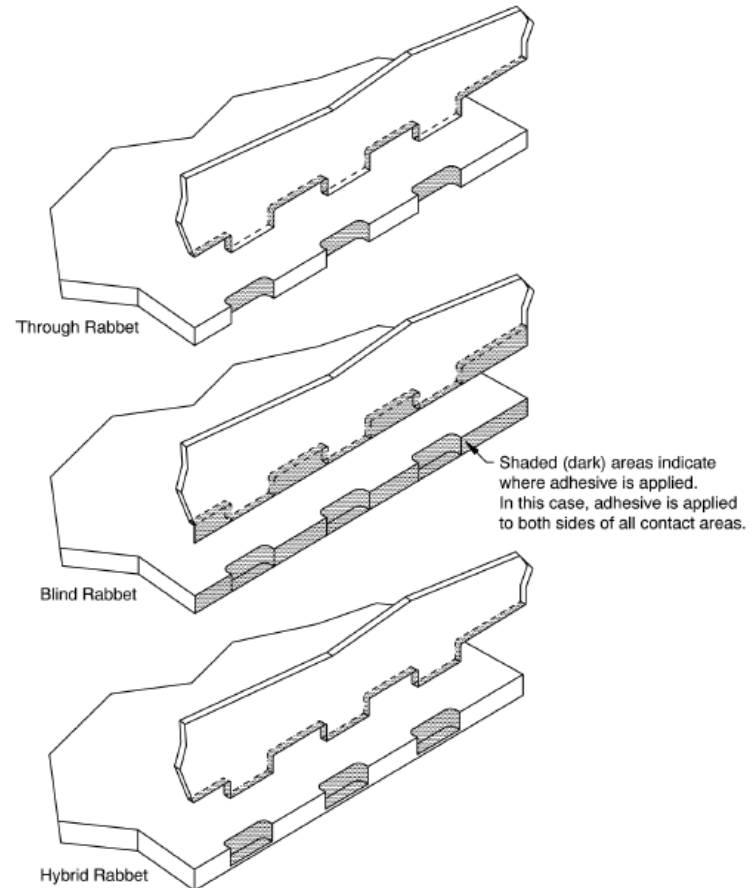
Item 24

“Bonded joints (ditch & pot, cut & fold, tab & slot, mortise & tenon, T-joints, bonded pins)”

Applicable Definitions

[PS] Joint Types (24) – The following illustrations define Ditch & Pot, Cut & Fold, Mortise & Tenon, Tab & Slot, T-joints, and Bonded Pin joints.

c. Mortise and tenon



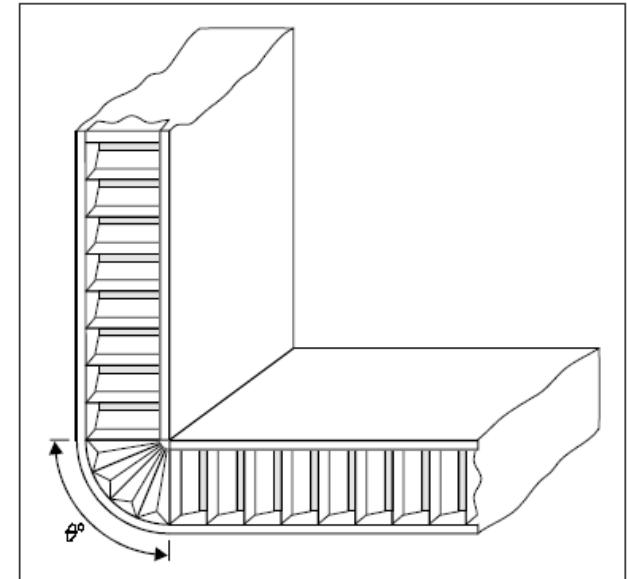
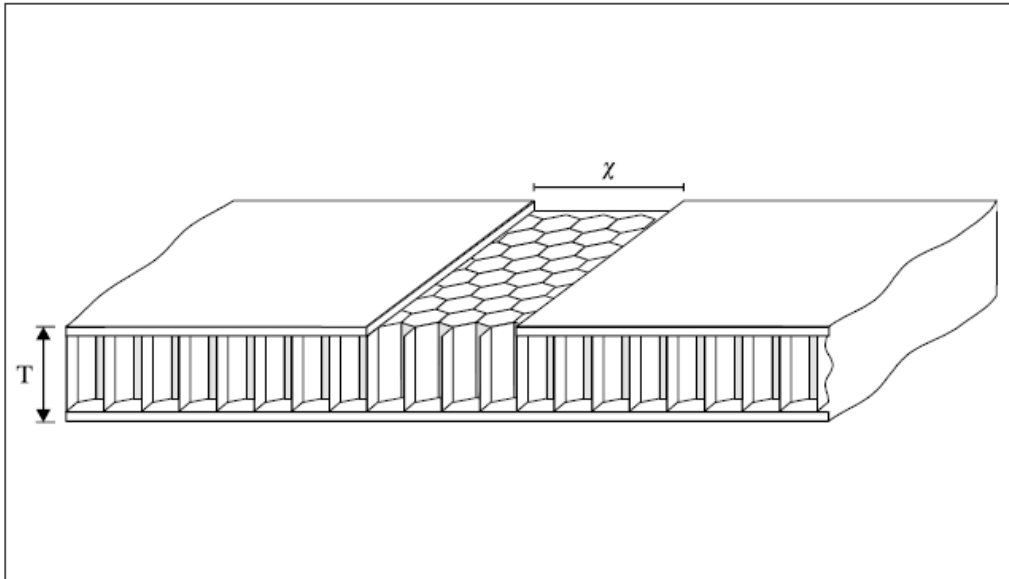
Item 24

“Bonded joints (ditch & pot, cut & fold, tab & slot, mortise & tenon, T-joints, bonded pins)”

Applicable Definitions

[PS] Joint Types (24) – The following illustrations define Ditch & Pot, Cut & Fold, Mortise & Tenon, Tab & Slot, T-joints, and Bonded Pin joints.

d. Cut and fold



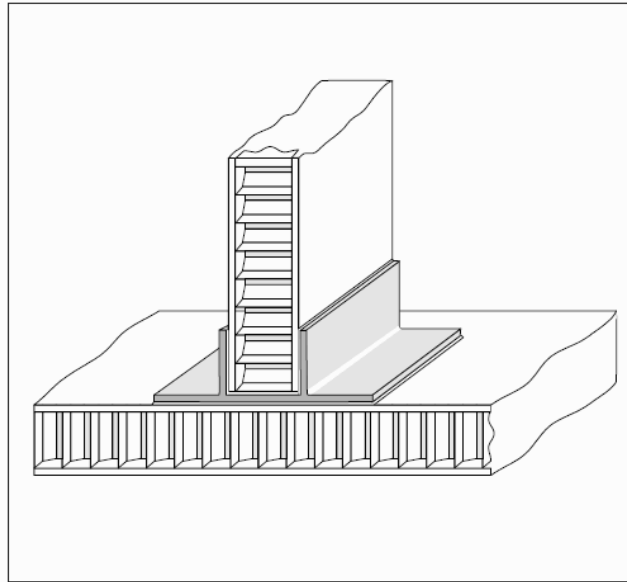
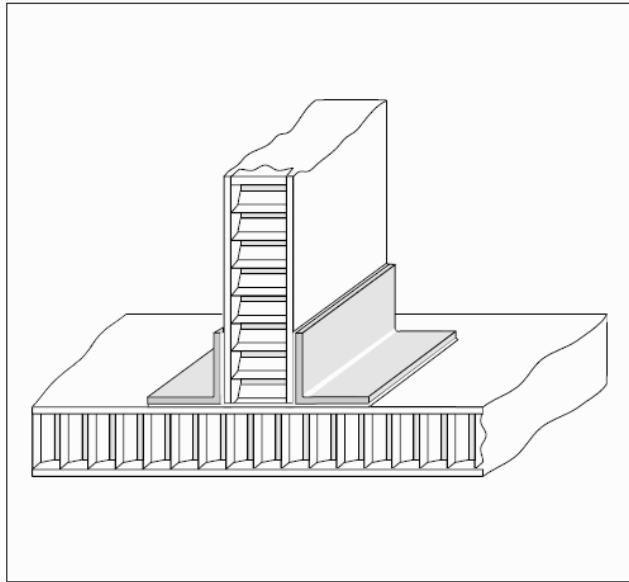
Item 24

“Bonded joints (ditch & pot, cut & fold, tab & slot, mortise & tenon, T-joints, bonded pins)”

Applicable Definitions

[PS] Joint Types (24) – The following illustrations define Ditch & Pot, Cut & Fold, Mortise & Tenon, Tab & Slot, T-joints, and Bonded Pin joints.

e. T-joints



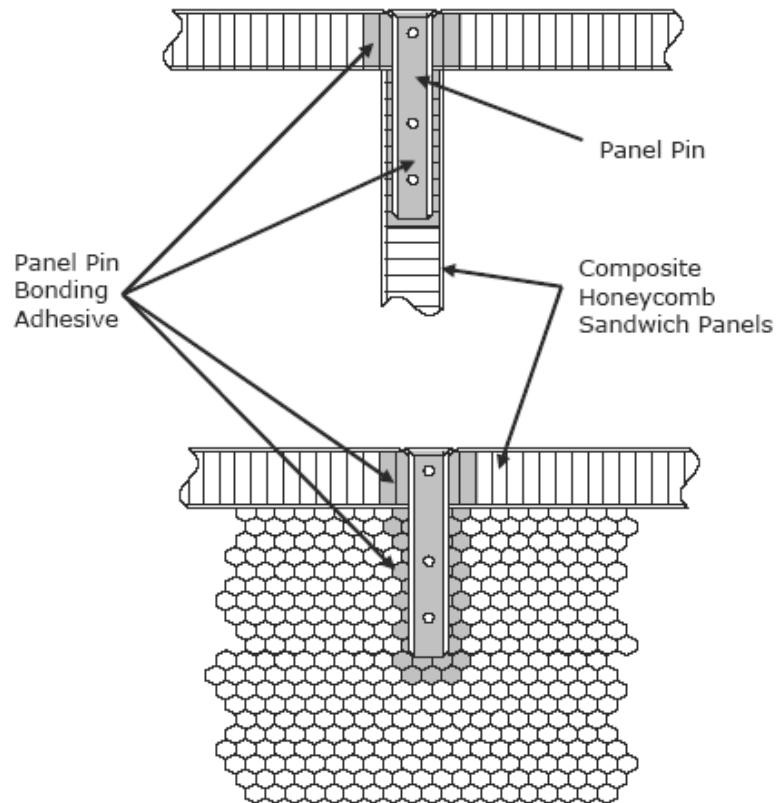
Flammability Policy Statement, PS-ANM-25.853-01 Item 24

“Bonded joints (ditch & pot, cut & fold, tab & slot, mortise & tenon, T-joints, bonded pins)”

Applicable Definitions

[PS] Joint Types (24) – The following illustrations define Ditch & Pot, Cut & Fold, Mortise & Tenon, Tab & Slot, T-joints, and Bonded Pin joints.

f. Bonded pin joint



Item 24

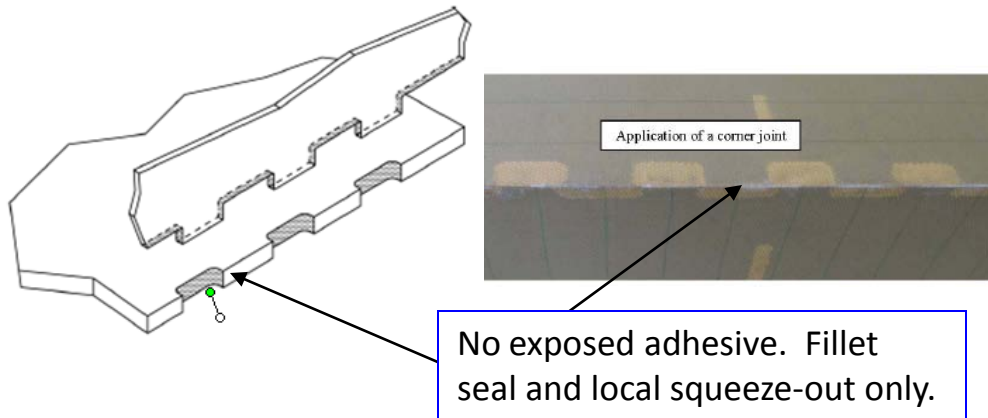
“Bonded joints (ditch & pot, cut & fold, tab & slot, mortise & tenon, T-joints, bonded pins)”

Examples of Policy Statement Usage

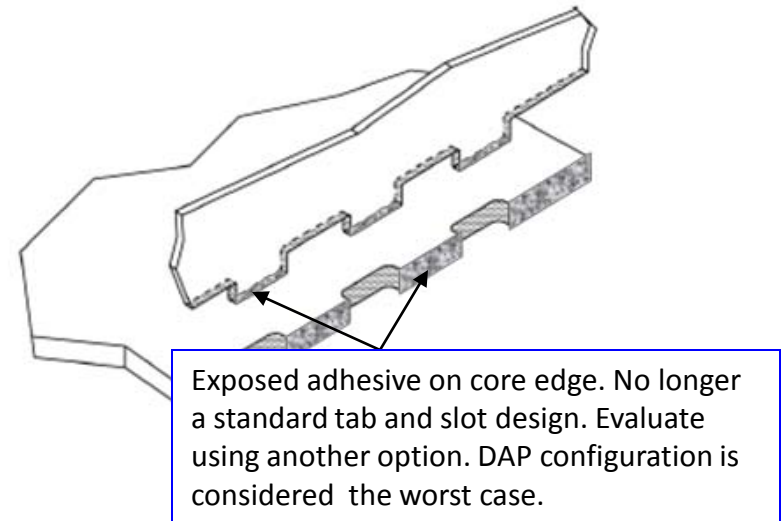
Item 24, Option 1:

This option is applicable to all joint types in which the adhesive is not exposed. Squeeze-out or fillet seal application is not considered “exposed.” Criterion 3 of Option #1 provides guidance that the adhesive needs to be “inside the joint.” When adhesive is exposed along the joint length, Option 1 is NOT available for showing compliance, and one of the other options will be required.

Example: Mortise & Tenon/Tab & Slot designs



PS 24, Option 1 Acceptable



PS 24, Option 1 Not Acceptable

Item 25

“Bonded inserts²”

Change from Draft Policy
Minimal

| Reference Number | Feature / Construction | 25.853(a) Bunsen Burner Test Requirement/Similarity | 25.853(d) Heat Release and Smoke Test Requirement/Similarity |
|------------------|-----------------------------|---|--|
| 25 | Bonded inserts ² | No test required. | No test required. |

² “Bonded inserts” refers to individually potted/bonded inserts, where the diameter of the adhesive is not more than 3 times the diameter of the insert. In addition, this guidance does not apply to installations with an essentially uniform distribution of fasteners over an entire surface*... this guidance is therefore limited to localized installations where the potting/adhesive is a minority of the panel core area.

*A peg board for example.

Flammability Policy Statement, PS-ANM-25.853-01

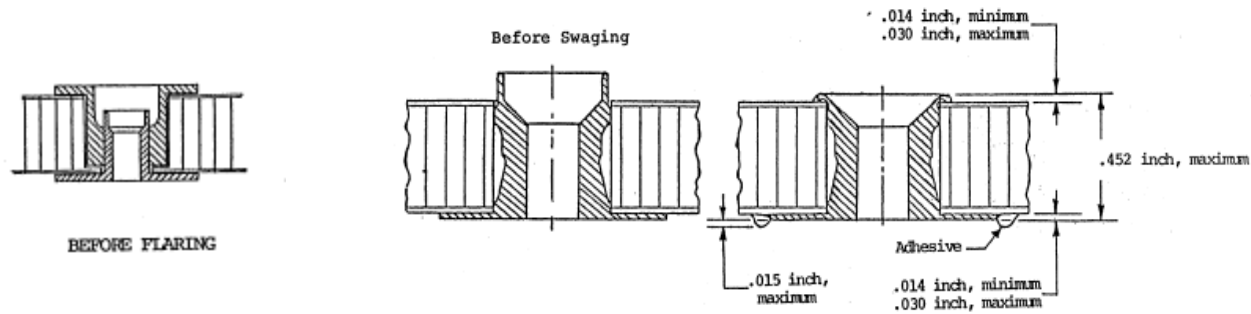
Item 25

“Bonded inserts”

Applicable Definitions

See attached figures that illustrate common insert types:

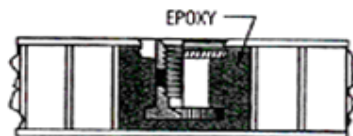
Flanged Inserts



One-piece

Two-piece

Blind Insert



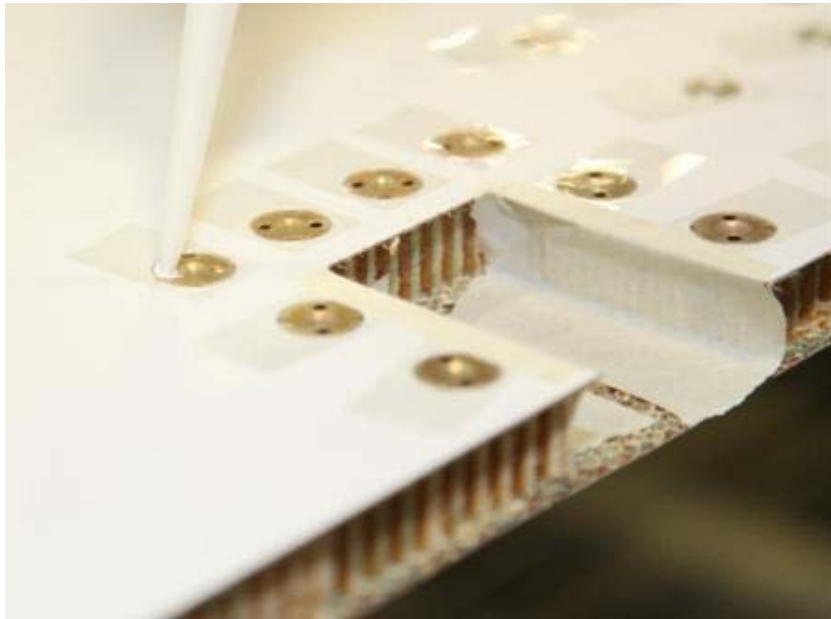
Flammability Policy Statement, PS-ANM-25.853-01

Item 25

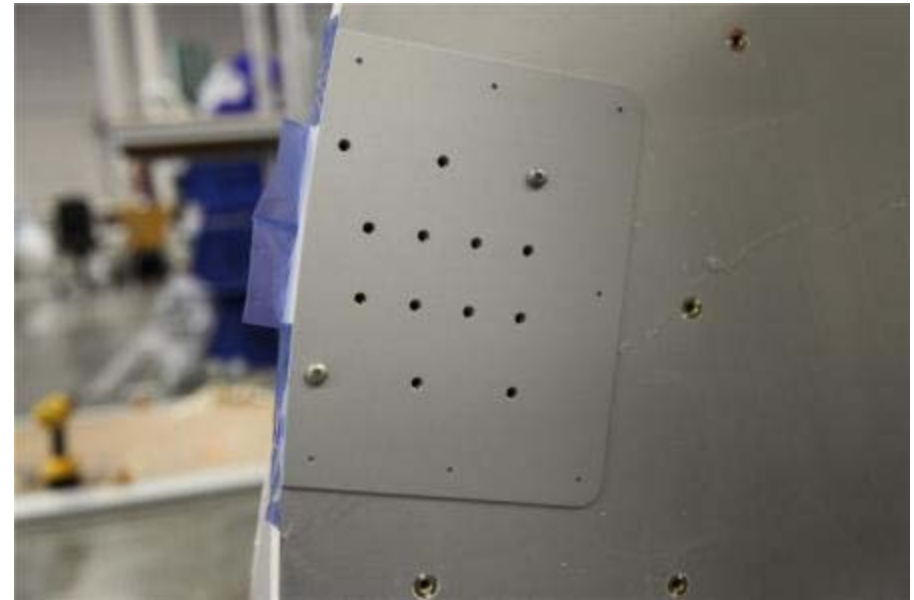
“Bonded inserts”

Applicable Definitions

See attached figures that illustrate common insert types:



Representative assembly showing acceptable localized individually potted inserts



Inserts Around a Cutout for a Fitting
(Inserts in center of panel for attaching wire bundles)

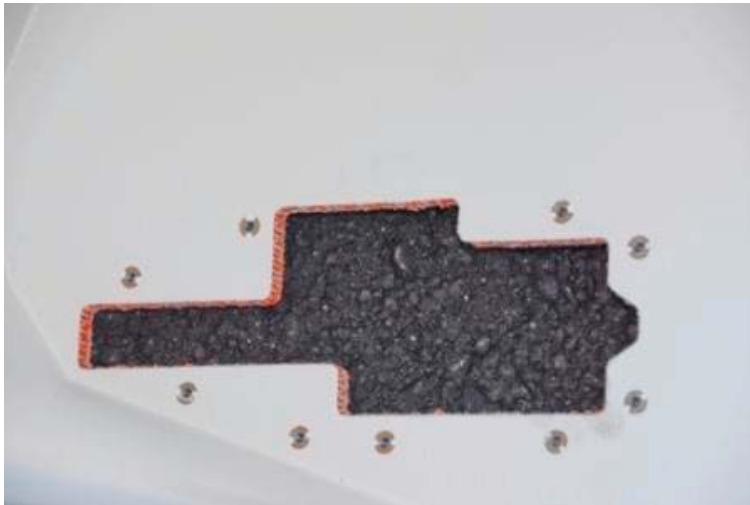
Flammability Policy Statement, PS-ANM-25.853-01

Item 25

“Bonded inserts”

Applicable Definitions

See attached figures that illustrate common insert types:



Inserts Around a Cutoff for a Fitting

Item 26**“Sealant, fillet seals”**

Change from Draft Policy
Moderate

| Reference Number | Feature / Construction | 25.853(a) Bunsen Burner Test Requirement/Similarity | 25.853(d) Heat Release and Smoke Test Requirement/Similarity |
|------------------|------------------------|---|--|
| 26 | Sealant, fillet seals* | No test required. | No test required. |

Applicable Definition

[PS] Fillet Seal - A seal applied after assembly at the junction of two adjoining parts or surfaces, or along the edges of faying surfaces as a continuous bed of sealing material. It can be applied over, along the edges of, and between installed parts. A fillet seal can also be formed as a result of **squeezing** a bonded joint.

NOTE:

The bond surface or faying surface of a joint construction are not covered by this MOC. Such features should be covered by Item 21, Bonded Details.

NOTE:

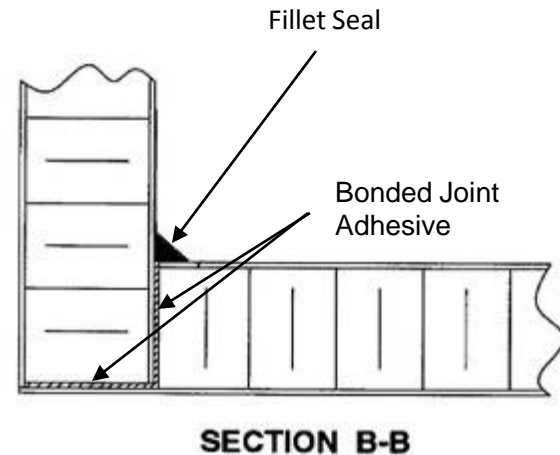
“Squeezing” is a typographical error. The intent is to address the adhesive “squeeze-out” when assembling a joint with sealant. Replace “squeezing” with “squeeze out from...”

Item 26 “Sealant, fillet seals”

Example 1: Bonded joint construction with fillet seal applied

The cross-section B-B of the joint identifies the use of 2 different adhesives/sealants to complete the assembly. This joint is shown compliant to 14CFR 25.853(a) as follows:

- 1) The fillet seal material applied to the finished joint is shown compliant using PS 26. No test is required.
- 2) The bonded joint adhesive is shown compliant using one of the 5 options described in PS 24.

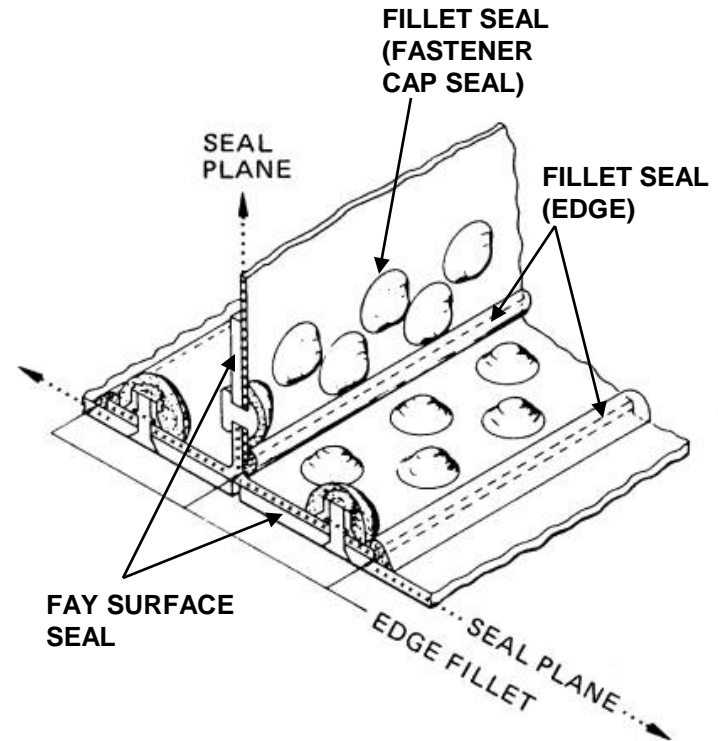


Item 26 “Sealant, fillet seals”

Example 2: Fillet sealing of fasteners (cap seal)

The schematic shown to the right illustrates where fasteners are fillet-sealed to prevent moisture from entering the joint and creating an environment for corrosion. This installation method is shown compliant as follows:

- 1) Fillet Seal (edge): Shown compliant using PS 26. No test is required. Applies to either post-applied sealant or squeeze-out.
- 2) Fillet Seal (fastener cap seal): Shown compliant using PS 26. No test is required.
- 3) Fay Surface Seal: Shown compliant using one of the 5 options described in PS 21.



Item 27 – Renumbered from Item 11 “Backside decorative treatment”

Change from Draft Policy
Minimal

| Reference Number | Feature / Construction | 25.853(a) Bunsen Burner Test Requirement/Similarity | 25.853(d) Heat Release and Smoke Test Requirement/Similarity |
|------------------|-------------------------------|--|--|
| 11 | Backside decorative treatment | Test data from a panel tested with a decorative (decorative laminate or paint) on the backside substantiates a panel with no decorative on the backside. | Test data from a panel tested with a decorative (decorative laminate or paint) on the backside substantiates a panel with no decorative on the backside. |

CLARIFICATION FOR POLICY STATEMENT:

Policy Statement contains two “Reference Number 11.”

- First PS-11: “Backside decorative treatment” becomes “Reference Number 27.”
- Second PS-11: “Decorative texture” remains as “Reference Number 11.”

Applicable Definitions

[PS] Decorative Laminate: A polymer-based, non-fibrous, single- or multilayer, thin-gage, non-self-supporting decorative sheet that typically contains at least one layer of a fluoropolymer-based film material. (Decorative laminates are always applied to the surface of a part, and therefore never form self-supporting parts. Decorative laminates are typically used on surfaces of sidewalls, lavatories, galleys, closets, linings, partitions, bin doors, and ceilings. Other words used within the industry for the term decorative laminate are Tedlar®, Decorative Tedlar® Laminate, declam, Airdec®, Panlam®, AerFilm®, Flexdec®, Décor, and Decorative Film.)

CLARIFICATION FOR POLICY STATEMENT:

“Fibrous” refers to textile decoratives (tapestries, carpets, etc.). “Non-fibrous” does not refer to reinforced decorative laminates.

Utilizing Multiple MoCs for Compliance

Per the Policy Statement (excerpt below), unless explicitly prohibited by a Policy Statement MoC, combining MoCs is acceptable.

Policy Statement excerpt:

“Another consideration regarding MOCs is using multiple MOCs for a part. In general, each MOC applies individually. However, some MOCs are based on certain parameters that do not make a difference in flammability results or have a clear critical case. For example, in Bunsen burner testing, thinner sandwich panels are more critical than thicker panels. Also, the color of *certain types* of decoratives does not make a difference in flammability results. Thus, a thin panel of an arbitrary color of a particular decorative could be used to substantiate thicker versions of the same panel using different colors of the same decorative.”

Example: MoC explicitly restricting the use combining certain MoCs

As described in PS 9, “Color of Thermoplastic”, the same thickness of a different color thermoplastic material is required for similarity analysis. Thus, the thickness range criteria defined in PS 3 cannot be combined when showing compliance for different colors of thermoplastics.

Flammability Policy Statement, PS-ANM-25.853-01

Utilizing Multiple MoCs for Compliance

The following are common combinations of MoCs when showing compliance for an assembly:

- 1) PS 3 “Thickness Ranges” and PS 8 “Decorative Laminate Color” for honeycomb panel designs.

- 2) When a panel assembly has multiple features, combining MoCs for to account for each local feature is acceptable. For example:
 - Bonded inserts PS 25
 - Skin and Decorative Orientation PS 6 and 12
 - Metal Edge Trim PS 17
 - Adhesive Panel Joints PS 24
 - Bonded Details PS 21
 - Doubler, metal, co-cured PS 18

Flammability Policy Statement, PS-ANM-25.853-01

PS 3, 10
DP 2, 9, 24

Use of Multiple MOCs - Item 3 and 10 Example “Thickness ranges and Face as a Separate Entity”

25.853(a) Bunsen Burner Test Substantiation Methods “Thin for Thick” (overall test coupon thickness > 0.25”)

Existing Test Data

Side A Test



2 plies of prepreg X
0.50" Honeycomb core
2 plies of prepreg X

Side B Test

New Part Construction
Requiring a Showing of Compliance

Side A



2 plies of prepreg X
0.75" Honeycomb core
4 plies of prepreg X

Side B

Acceptable: Both sides of the new part construction require substantiation because the total thickness is > 0.25". The existing 60 second vertical burn test data (on the 0.50" honeycomb core with 2 plies of prepreg) substantiate Side A of the new part per PS 10 (FASE). The same test data can substantiate Side B of the new part using PS 10 (FASE) and PS 3 (Thickness Ranges), because the 2 plies on the existing panel are thinner than the 4 plies on the Side B face of the new panel. This example would also be acceptable if the tested item had .75" thick core and the new item had .50" thick core.

Flammability Policy Statement, PS-ANM-25.853-01

Applicability to Special Conditions

Policy Statement excerpt:

“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.”

Example: Seat Heat Release Special Condition

The table on the next page provides a listing of the Policy Statement items that can be used for showing compliance for those items determined to require a showing of compliance under the seats heat release special conditions.

Flammability Policy Statement, PS-ANM-25.853-01

Applicability to Special Conditions

Seat Heat Release Special Conditions:

| Seat HRSC MOC Applicability Cross-Reference for 14 CFR 25.853(d) | | |
|--|--|---|
| Policy Statement | MOC Title | Application Info |
| 3 | Thickness Ranges | Apply MOC criteria to test configuration |
| 4 | Core, Density | Apply MOC criteria to test configuration |
| 5 | Core, Cell Size/Shape | Apply MOC criteria to test configuration |
| 6 | Skin Ply Layup, Orientation | Common Preamble MOC--no testing required |
| 7 | Paint Color | Apply MOC criteria to test configuration |
| 8 | Decorative Laminate Color | Apply MOC criteria to test configuration |
| 9 | Thermoplastic, Elastomer, & Decorative Non-Textile Floor Coverings Color | Apply MOC criteria to test configuration |
| 11 | Decorative Texture | Common Preamble MOC--no testing required |
| 12 | Decorative Laminate Orientation | Common Preamble MOC--no testing required |
| 16 | Embedded Metal Details | No testing required for cross-section of panel |
| 17 | Edge trim, metal (including metal joint covers) | No testing required for cross-section of panel |
| 18 | Doubler, metal, co-cured | No testing required for cross-section of panel |
| 21 | Bonded Details | No testing required for cross-section if the criteria are met. Mechanically fastened details may be treated similarly per AC25-17A. |
| 22 | Surfacing Material | Apply MOC criteria to test configuration |
| 23 | Edge Potting/Edge Foam | No testing required for cross-section of panel |
| 24 | Bonded Joints* (Ditch and pot ,Cut and fold, Tab and slot, Mortise and tenon, T-joints, Bonded pins) | No testing required for cross-section if the criteria are met. |
| 25 | Bonded Inserts | Common Preamble MOC--no testing required for cross-section of panel |
| 26 | Sealant, Fillet Seals | Common Preamble MOC--no testing required for cross-section of panel |
| 27 | Backside Decorative Treatment | Apply MOC criteria to test configuration |

Flammability Policy Statement, PS-ANM-25.853-01

Applicability to Special Conditions

Seat Heat Release Special Conditions:

Seats HRSC MoC was approved by the Aviation Authorities on 2/28/2011:

Similarity analysis is allowed to either eliminate a test or test a different configuration. Therefore, PS item 21 is applicable when showing compliance to Seats HRSC for all bonded details; however, footnote 1 of PS 21 cannot be used to eliminate compliance required by the industry MOC. Only the following exclusions apply:

- a) It is a bond line less than 1.0" wide on an individual item
- b) It is located fully within 2.0" of panel edge
- c) It is located fully within 4.0" of cabin floor
- d) It is lineally* applied and less than 2 sq ft in total surface area on a panel surface.

Seat Heat Release Special Conditions How to Substantiate an Item

2

Method of Substantiation

For each panel requiring substantiation, compliance may be shown using methodologies and regulator-approved means of compliance developed to show compliance with 25.853(d). These include:

1. The panel can be tested in a direct showing of compliance to Appendix F, Parts IV and V.
2. A similarity analysis can be done to either eliminate a test, or test a different configuration using accepted methods of compliance as follows:
 - FAA Draft or Final Policy on testing of design features for flammability (reference: FAA Policy Memo ANM-115-09-XXXX dated August 24, 2009)
 - Company-specific, accepted MOC's for heat release testing
 - Accepted policy and guidance for heat release testing
 - Testing with "fabrics bonded all over" (per EASA requirement) is accepted by the FAA as sufficient to substantiate the part with the fabric removed (per FAA requirement)
3. Use of the 1.5 square foot exclusion per seat place

Flammability Policy Statement, PS-ANM-25.853-01

Applicability to Special Conditions

Seat Heat Release Special Conditions:

Seats HRSC MoC was approved by the Aviation Authorities on 2/28/2011:

Requires use of Policy Statement. Therefore, PS item 21 “Bonded Details” is applicable when showing compliance to the Seats HRSC for rub strips, trim strips, and bumpers. See next slide for additional guidance.

Traditional vs. Non-Traditional

Rub Strips and Trim Strips

Rub strips installed on traditional panels are themselves traditional.

Rub strips/trim strips / bumpers installed on non-traditional panels will be evaluated based on the final FAA policy scheduled to be published in 2011.

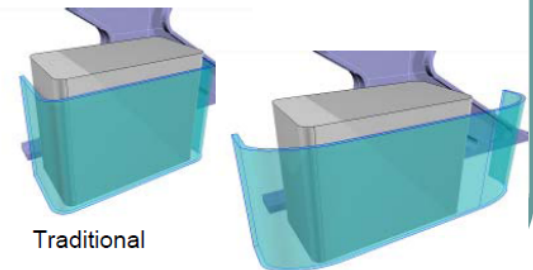
Shrouds

Traditional: Items which are serving the purpose of closing out Electrical components (including bend radii for cables and other necessary clearances) and Moving parts, seat belt alignment shrouds, Drip Shields, Shrouds and for finger pinch certification protection (25.601). These shrouds maybe located anywhere on the seat provided they are sized as necessary to serve their intended protective function. Material selection does not impact determination.

Non-traditional: Primary purpose is to screen or hide items which are not specifically listed in the traditional category

• Rub Strip - the material (typical non-metallic) attached to panel for the purpose of protecting that panel from an impact of another object (e.g. a galley cart or luggage)

• Trim Strip - a capping material (metal or non-metallic) attached to the edge or between panels for the purpose of closing out or protecting an edge.



Traditional

Non-Traditional

29-Nov-10

29

Flammability Policy Statement, PS-ANM-25.853-01

Industry HRSC MOC on Rub Strips, Trim Strips, and Bumpers

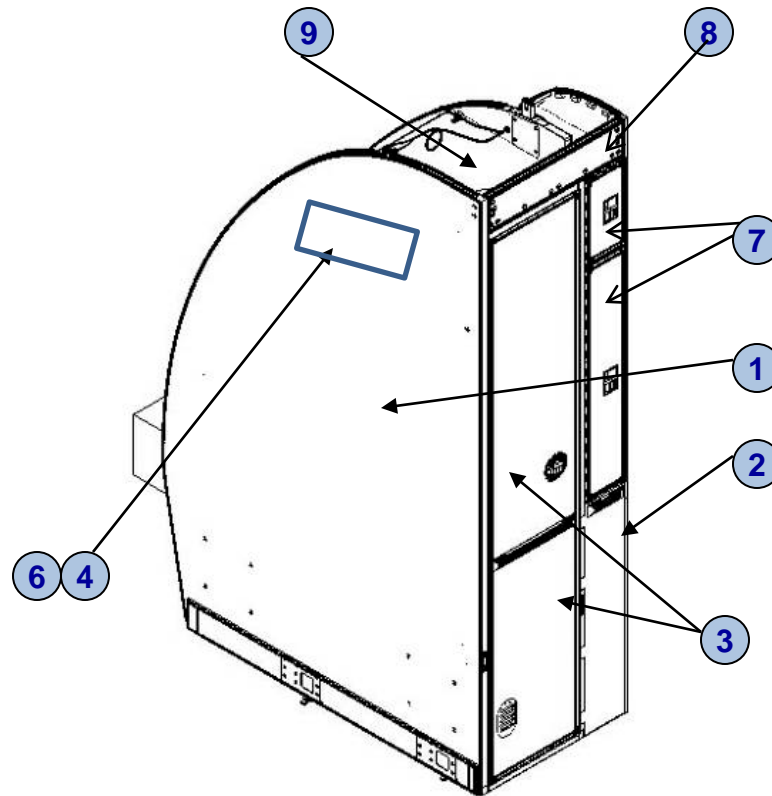
- A rub strip is a material (typically non-metallic) mechanically attached or bonded to a panel for the purpose of protecting that panel from an impact of another object like a food cart or luggage.
 - These criteria for traditional and non-traditional rub strips, trim strips, and bumpers apply to both mechanically fastened and bonded items.
 - Rub strips installed on traditional panels are traditional
 - Rub strips installed on non-traditional panels are evaluated based on the size of the rubstrip.
 - Rub strips with an exposed-surface area of one square foot or less are considered small enough that they are considered traditional.
 - Rub strips with an exposed-surface area greater than one square foot that meet any of criteria below are considered traditional:
 - It has a bond line less than 1.0" wide on a individual item, or
 - It is located fully within 2.0" of the panel edge
 - It is located fully within 4.0" of the cabin floor
 - It is lineally* applied and less than 2 sq ft in total surface area on a panel surface.
- *A rub strip is considered to be lineally applied when it is a long thin part typically with a width of 2.0" or less and the surface area is spread out in a long, narrow band.*
- Rub strips with an exposed-surface area greater than one square foot, that do not fit into the above criteria are considered non-traditional.
 - A trim strip is a capping material (metal or non-metallic) attached to the edge or between panels for the purpose of closing out or protecting an edge
 - A bumper is a side molding attached to other panels
 - For example - composite edge trim.
 - Trim strips and bumpers installed on traditional or non-traditional panels are evaluated in the same way as rub strips installed on non-traditional panels.

Flammability Policy Statement, PS-ANM-25.853-01

Citing Policy Statement in Compliance Test Plans/Test Reports

The following example illustrates one way to reference the Policy items within specific compliance reports.

Typical Interior Monument



Flammability Policy Statement, PS-ANM-25.853-01

X = Certify by test
S = Certify by similarity

1.0 MATERIAL TEST LIST

| ITEM | TEST REQUIREMENT | | | | | | | | | | | TEST REFERENCES AND REMARKS |
|-------------|------------------|----|----|----|----|----|---|----|----|-----|-----|---|
| | | F1 | F2 | F3 | F4 | F5 | F6 | F7 | HR | SD | TOX | |
| 1 | SIDE 1 | X | | | | | | | X | X | | SIDE 1: SIDE 2: |
| | SIDE 2 | X | | | | | | | | | | |
| | | | | | | | | | | | | |
| PART NUMBER | NOMENCLATURE | | | | | | MATERIAL SPECIFICATION | | | | | |
| | Fwd Panel | | | | | | L1: Decor A, Color white L2: Adhesive A L3: Panel A (.5" thick) | | | | | |
| ITEM | TEST REQUIREMENT | | | | | | | | | | | TEST REFERENCES AND REMARKS |
| | F1 | F2 | F3 | F4 | F5 | F6 | F7 | HR | SD | TOX | | |
| 2 | SIDE 1 | S | | | | | | | S | S | | SIDE 1: F1, HR, SD Sim to item 1, PS#8 SIDE 2: F1 Same as item 1 Side 2, PS#10 |
| | SIDE 2 | S | | | | | | | | | | |
| | | | | | | | | | | | | |
| PART NUMBER | NOMENCLATURE | | | | | | MATERIAL SPECIFICATION | | | | | |
| | Aft Panel | | | | | | L1: Decor A, Color Blue L2: Adhesive A L3: Panel A (.5" thick) | | | | | |
| ITEM | TEST REQUIREMENT | | | | | | | | | | | TEST REFERENCES AND REMARKS |
| | F1 | F2 | F3 | F4 | F5 | F6 | F7 | HR | SD | TOX | | |
| 3 | SIDE 1 | S | | | | | | | X | X | | SIDE 1: F1 Sim to item 1 side 1, PS#10 SIDE 2: F1 Same as item 1 Side 2, PS#10 |
| | SIDE 2 | S | | | | | | | | | | |
| | | | | | | | | | | | | |
| PART NUMBER | NOMENCLATURE | | | | | | MATERIAL SPECIFICATION | | | | | |
| | Aisle Panel | | | | | | L1: Decor A, Color Blue L2: Adhesive A L3: Panel A (1.0" thick) | | | | | |

Flammability Policy Statement, PS-ANM-25.853-01

| ITEM | TEST REQUIREMENT | | | | | | | | | | | TEST REFERENCES AND REMARKS |
|-------------|--------------------------------|----|----|----|----|----|---|----|----|---|-----|---|
| 4 | | F1 | F2 | F3 | F4 | F5 | F6 | F7 | HR | S | TOX | Substantiated per PS#21 Opt 1 and PS#10. Panel A with décor per item 1 Adhesive per item 5 Plastic Mirror per item 6 |
| | SIDE 1 | | S | | | | | | | | | |
| | SIDE 2 | S | | | | | | | | | | |
| PART NUMBER | NOMENCLATURE | | | | | | MATERIAL SPECIFICATION | | | | | |
| | Plastic Mirror bonded to Panel | | | | | | L1: Plastic Mirror, (.08" thick) L2: Adhesive B L1: Decor A, Color white L2: Adhesive A L3: Panel A (.5" thick) | | | | | |
| 5 | | F1 | F2 | F3 | F4 | F5 | F6 | F7 | HR | S | TOX | Sample size: 3x12x.25" |
| | SIDE 1 | | | | | | | | | | | |
| | SIDE 2 | | X | | | | | | | | | |
| PART NUMBER | NOMENCLATURE | | | | | | MATERIAL SPECIFICATION | | | | | |
| | Paste Adhesive | | | | | | L1: Paste Adhesive B | | | | | |
| 6 | | F1 | F2 | F3 | F4 | F5 | F6 | F7 | HR | S | TOX | |
| | SIDE 1 | | | | | | | | | | | |
| | SIDE 2 | | X | | | | | | | | | |
| PART NUMBER | NOMENCLATURE | | | | | | MATERIAL SPECIFICATION | | | | | |
| | Mirror | | | | | | L1: Plastic Mirror, (.08" thick) | | | | | |

Flammability Policy Statement, PS-ANM-25.853-01

| | | | | | | | | | | | | |
|--------------------|---------------------|----|----|----|----|--|----|----|----|----|-----|--|
| 7 | | F1 | F2 | F3 | □4 | F5 | F6 | F7 | HR | SD | TOX | SIDE 1: Test SIDE 2: F1, similar to side 1, PS#8, PS#10. |
| | SIDE 1 | X | | | | | | | X | X | | |
| | SIDE 2 | S | | | | | | | | | | |
| PART NUMBER | NOMENCLATURE | | | | | MATERIAL SPECIFICATION | | | | | | |
| | Door | | | | | L1: Decor A, Color Blue L2: Adhesive A L3: Panel B (.5" thick) L4: Adhesive A L5: Décor A, Color Red | | | | | | |
| 8 | | F1 | F2 | F3 | □4 | F5 | F6 | F7 | HR | SD | TOX | SIDE 1: F1, HRR, SD Sim to item 7, PS#8, PS#10, PS#27 SIDE 2: |
| | SIDE 1 | S | | | | | | | S | S | | |
| | SIDE 2 | X | | | | | | | | | | |
| PART NUMBER | NOMENCLATURE | | | | | MATERIAL SPECIFICATION | | | | | | |
| | Closet panel | | | | | L1: Decor A, Color Red L2: Adhesive A L3: Panel B (.5" thick) | | | | | | |
| 9 | | F1 | F2 | F3 | □4 | F5 | F6 | F7 | HR | SD | TOX | SIDE 1: SIDE 2: F1 Same as item 1 Side 2, PS#10 |
| | SIDE 1 | X | | | | | | | | | | |
| | SIDE 2 | S | | | | | | | | | | |
| PART NUMBER | NOMENCLATURE | | | | | MATERIAL SPECIFICATION | | | | | | |
| | Back Wall | | | | | L1: Paint A, color Purple applied per process specification xxxx. L2: Panel A (.5" thick) | | | | | | |

Questions?

Feedback

michael.e.jensen@boeing.com

scott.campbell@zodiac aerospace.com