



FSTG

Michael Jensen

FSTG Team Lead

**FAA International
Aircraft Materials
Fire Test Working
Group**

Atlantic City, NJ

FAA POLICY STATEMENT

PS-ANM-25.853-01-R2

**CLARIFICATIONS AND ADDITIONS FOR
FUTURE ADVISORY CIRCULAR**

March 7, 2017

Questions of Interpretation

- Since the Policy Statement ([PS-ANM-25.853-01-R2](#)) release, there have been questions regarding the interpretation of the policy.
- Revision 1 and 2 of the Policy clarified a number of those issues.
- A presentation given at the Triennial in Philadelphia in 2013 provided additional clarifications.
- There have been requests for additional Methods of Compliance (MoCs), wider applicability and further clarifications.

PS Clarifications and Additions – Working Plan

- Through the IAMFTWG, the Flammability Standardization Task Group (FSTG) collected requests that were assigned to Team Leaders to develop proposed wording and new data and analyses (where required) to clarify and devise new MoCs.
- All changes, data and analyses developed by FSTG have been or will be provided to the FAA Transport Airplane Directorate and EASA for consideration in adding to the proposed AC that will replace the current Policy Statement.

FSTG SharePoint (hosted by Zodiac)

FSTG2

Welcome Michael Jensen

This Site

Home

View All Site Content

Surveys

- Voting Polls for all Task Items

Documents

- General
- Voting Poll Summary

Lists

- FSTG 2 Members

Discussions

Sites

People and Groups

Recycle Bin

General

Name

Voting Poll Summary

How to Change Your Voting Poll Response

Setting Alerts in FSTG2 SharePoint

CHANGING YOUR PROFILE INFORMATION

FSTG2 Item Task Tracking Worksheet

(More Items...)

Add new document

New Policy Statement Items

| Name | Title | Description |
|----------|--|-------------|
| Item 101 | Fastened, non-bonded materials may be tested separately | |
| Item 102 | Rigid Foam Density (Core), Heat Release & VB | |
| Item 103 | Seat Shells - Multi prepreg layers across multi foam thickness and density | |
| Item 104 | UL 94 V0 certifies material to 12 second VB | |
| Item 105 | Industry Specs and Same definition | |

Announcements

VOTING POLL ADDED - ITEM 14 9/26/2016 9:02 AM
by Panade Sattayatom

VOTING POLL ADDED - ITEM 14 (UPDATED)

Poll is here:

A Zodiac sponsored SharePoint was used to coordinate information.

Existing Items

Existing Policy Statement Items

| Name | Title Description |
|---------|--|
| Item 1 | 60 Sec VB Substantiates 12 Sec VB Clarification |
| Item 10 | Face as a Separate Entity |
| Item 12 | Decorative Laminate Orientation |
| Item 13 | Synthetic Leather/Suede |
| Item 14 | Aluminum/Steel/Titanium Parts (excluding powder coating) |
| Item 15 | Powder Coated Metal |
| Item 16 | Embedded Metal Detail |
| Item 19 | Clear Plastic Windows and Signs |
| Item 20 | Printed Wiring Boards |
| Item 21 | Bonded Details |
| Item 23 | Edge Potting and/or Edge Foam |
| Item 24 | Bonded Joints |
| Item 26 | Sealant, Fillet Seals |
| Item 27 | Backside Decorative Treatment |
| Item 3 | Thickness Ranges |
| Item 9 | Color of Thermoplastics |

New Items

| New Policy Statement Items | |
|----------------------------|---|
| Name | Title Description |
| Item 101 | Fastened, non-bonded materials may be tested separately |
| Item 102 | Rigid Foam Density (Core), Heat Release & VB |
| Item 103 | Seat Shells - Multi prepreg layers across multi foam thickness and density |
| Item 104 | UL 94 V0 certifies material to 12 second VB |
| Item 105 | Industry Specs and Same definition |
| Item 106 | Developing future MOCs - Standard |
| Item 107 | Add applicability to 45 Degree BB |
| Item 108 | Textile Color Similarity - VB only (Maybe (d)) |
| Item 109 | Testing inorganic (stone) Vertical Burn Only (OSU if single material - no bonding) |
| Item 110 | Wood Veneer Similarity |
| Item 111 | Floor Coverings MOC (Separate from PS21) |
| Item 112 | Metal Bond Primers and use of PS 14 to test bare metal in lieu of painted or primed |
| Item 113 | Effect of Paint Thickness - Thin for thick or Thick for thin? |
| Item 114 | Additive Manufactured Parts |
| Item 115 | Crushed Core Panel - Instate original Report Definition |
| Item 116 | Small Part definition |
| Item 117 | Low density foam for higher density foam (Flexible) |
| Item 118 | Leather similarity |
| Item 119 | Placarding |
| Item 120 | EWIS |
| Item 121 | Composite Panels Substantiating Aluminum Panels for Vertical Burn |

Status of Submittals

| PS# | Sub # | Leader | Issue | Data Req'd | Proposal Submittal | Data Submittal | Complete |
|-----|-------|------------------------|---|------------|--------------------|----------------|----------|
| 3 | A | Bart & Steven | Core thickness versus Panel thickness | | 11/17/2016 | NA | Yes |
| 3 | B | Bart & Steven | Sliding panel thickness range | | 11/17/2016 | NA | Yes |
| 3 | C | Bart & Steven | Add Millimeter near equivalents | | 11/17/2016 | NA | Yes |
| 9 | A | Charles Nam | Allow PS 9 and PS 3 to be used together | Yes | 12/22/2016 | 12/22/2016 | yes |
| 9 | B | Blake Hall | Clarify PS 9 can be used in stack-ups | | | | |
| 9 | C | Magno Gil/Asfaw Beyene | Ink lettering is insignificant | Maybe | | | |
| 9 | D | Magno Gil/Asfaw Beyene | Use PS 9 for ink coating one entire side | | | | |
| 9 | E | Michael Miler | Definition of integrally colored | | | | |
| 10 | A | Gwen Garman | Change wording to $\leq 1/4$ " (mm) | | 12/22/2016 | | Yes |
| 10 | B | Scott Campbell | 1/4 panel or less test data allowed for PS 10 | | 12/22/2016 | | Yes |
| 12 | A | Michael Miler | Add language to cover thermoplastics to PS 12 | | | | |
| 13 | A | Gilberto Niitsu | Allow 60 sec VB similarity for faux leather | Yes | 11/17/2016 | 11/17/2016 | yes |
| 14 | A | Ingo Weichert | Add additional metals to applicability | | 12/22/2016 | | Yes |
| 14 | B | Marjan Chini | HR/SM not required for metals with inorganic finishes | Maybe | 12/22/2016 | | Yes |

Status of Submittals

| | | | | | | | |
|-------|---|-------------------|---|-----|------------|------------|-----|
| 15 | A | Bart & Steven | Add HR and Sm to powder coating Similar to PS 7 | Yes | 15-Dec-16 | 15-Dec-16 | Yes |
| 16 | A | Scott Campbell | Bonded metal same as Embedded Metal | Yes | 12/22/2016 | 12/22/2016 | Yes |
| 19 | A | Keith Couilliard | Clarify a dust cover is a window | | 17-Nov-16 | NA | Yes |
| 20 | A | Michael Jensen | Any PWB tracing certifies any other tracing | | 8-Nov-16 | NA | Yes |
| 21 | A | Scott Campbell | Bonded Carpet is allowed as a detail (tape & squares) | | 12/22/2016 | NA | Yes |
| 21 | B | Scott Campbell | Clarify Bonded Detail Definition | | 12/22/2016 | NA | Yes |
| 21 | C | Scott Campbell | Extend MoC to all bonding | | 12/22/2016 | NA | Yes |
| 21 | D | Scott Campbell | MOC applies to multiple stacked bonded details | | 12/22/2016 | NA | Yes |
| 21 | E | Scott Campbell | Test needs to match requirement of Bonded Detail | | 12/22/2016 | NA | Yes |
| 21 | F | Scott Campbell | Double sided tapes tested at 1 ply | | 12/22/2016 | NA | Yes |
| 21 | G | Scott Campbell | Double sided tape certified by any of the 4 options | | 12/22/2016 | NA | Yes |
| 21 | H | Chuck Story | Adhesive plaque can be thinner than 1/4" (Opt. 1) | Yes | 12/22/2016 | 12/15/2016 | Yes |
| 21 | I | Anna Nguyen | Single sided tapes may be certified to option 3 or 4 | | 12/22/2016 | NA | Yes |
| 21 | J | Dan Slaton | 2 ply laminate definition | | 12/22/2016 | NA | Yes |
| 21 | K | Scott Campbell | PS 21 applies to bonded metal as well | | 12/22/2016 | 12/22/2016 | Yes |
| 21 | L | Glenn Swain | For heat release and smoke, testing a thinner metal substantiates a thicker metal | Yes | 12/22/2016 | NA | Yes |
| 21 | M | Gwen Garman | For HR/SM use <=, not < | | 12/22/2016 | NA | Yes |
| 23/24 | A | Patrick Zimmerman | Decorative over bonded joint compliant by base panel | | 11/8/2016 | | Yes |
| 24 | A | Patrick Zimmerman | VB - Single ditch certifies multi-ditch | | 11/8/2016 | | Yes |
| 26 | A | Keith Couilliard | Applicable to metal to - Generalize to all metal to metal bonding | | | | |
| 26 | B | Keith Couilliard | metal to composite fay seals | | 12/22/2016 | 12/22/2016 | Yes |
| 27 | A | Bart & Steven | Add Powder Coat | | 10-Nov-16 | NA | Yes |
| 27 | B | Gwen Garman | Applicable to <1/4" panels | | 10-Nov-16 | NA | Yes |
| 27 | C | Bart & Steven | 2 layers of DTL certify a single layer of DTI on backside | | 10-Nov-16 | 10-Nov-16 | Yes |

Status of Submittals

| | | | | | | |
|-----|----|---------------------------|---|---------|---------------------|---------------|
| New | 1 | Tom Little | Fastened, non-bonded materials may be tested separately (VB). | Yes | 12/22/2016 | yes |
| New | 1A | Tom Little | HR/SM for mechanically fastened panels (Panel over Panel) | | 12/22/2016 | yes |
| New | 2 | Tom Little | Rigid Foam Density (Core), Heat Release & VB | Yes | | |
| New | 3 | | Seat Shells - Multi prepreg layers across multi foam thickness and density | Yes | | |
| New | 4 | Jeff Smith | UL 94 Vo certifies material to 12 second VB | Yes | | |
| New | 5 | Tom Little | Industry Specs and Same definition | Process | | |
| New | 6 | Dan Slaton | Developing future MOCs - Standard | Process | | |
| New | 7 | Klaus Boesser | Add applicability to 45 Degree BB | Maybe | 12/22/2016Draft | No |
| New | 8 | Heiko Nuessel | Textile Color Similarity - VB only (Maybe (d)) | Yes | | |
| New | 9 | Melanie Prince | Testing inorganic (stone) Vertical Burn Only (OSU if single material - no bonding) | Maybe | | |
| New | 10 | Melanie Prince | Wood Veneer Similarity | Yes | | |
| New | 11 | Scott Campbell | Floor Coverings MOC (Separate from PS21) | | | |
| New | 12 | Marjan Chini | Metal Bond Primers and use of PS 14 to test bare metal in lieu of painted or primed | | | |
| New | 13 | Hans & Jacques | Effect of Paint Thickness - Thin for thick or Thick for thin? | Yes | | |
| New | 14 | Chuck Wilson | Additive Manufactured Parts | Yes | | |
| New | 15 | Scott Campbell | Crushed Core Panel - Restate original Report Definition | Maybe | 12/22/2016Test Plan | No |
| New | 16 | Grant Joplin/Andrew Olsen | Small Part definition | | | |
| New | 17 | Chris Boyer | Low density foam for higher density foam (Flexible) | Yes | | 217-535-3517 |
| | 1 | TBD | Add HR for VB to heirachy | | 8-Nov-16NA | Yes |
| New | | Martin | Wire MoCs | | | |
| New | 18 | Zodiac Montreal | Leather similarity | | 12/22/2016Draft | No |
| New | 19 | Magno Gil/Asfaw Beyene | Ink lettering is insignificant/Use PS 9 for ink coating one entire side | Maybe | 12/22/2016 | 12/22/2016Yes |
| New | 20 | Martin Spencer | EWIS | | | |

PS-1 Update

| Ref # | Feature/ Construction | 25.853(a) Bunsen Burner Test Requirement/Similarity | 25.853(d) Heat Release and Smoke Test Requirement/Similarity |
|-------|--------------------------------------|--|--|
| 1 | Materials and constructions, general | 60-second vertical Bunsen burner test data may be used to substantiate configurations that only require 12-second vertical Bunsen burner data. Vertical Bunsen burner test data may be used to substantiate configurations that only require horizontal Bunsen burner testing. Additionally, for panel constructions¹, 14 CFR 25.853(d) heat release data may be used to substantiate 60 second or 12 second vertical Bunsen burner requirements | Test requirement is decided based on size criteria. ² 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. |

PS-1 Continued

1 - A panel construction is defined as any of the following 3 constructions/materials:

- **Sandwich Panel** - A rigid panel fabricated using face sheets (either reinforced thermosetting resins or metal) on either side of a core material (a rigid foam or a honeycomb structure made of aluminum or phenolic resin and Nomex paper, Kevlar, Ultem or fiberglass).
- **Laminates** - A composite laminate (0.020" or greater in thickness) made from resin (phenolic, epoxy, polyester or bismaleimide) reinforced fiber (fiberglass, carbon, Kevlar, Nomex or quartz).
- **Thermoplastics** – Thermoformable plastic resins (sheet, injection molded or extruded) greater than 0.02". Includes any reinforcement fibers (fiberglass, carbon, Kevlar, Nomex or quartz).

2 - 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).

PS-3 25.853(d) Update

- Except for foam core panels with composite laminate face sheets —where each thickness must be tested, the following options are acceptable:
 - Test the maximum and a minimum thickness¹ of the range shown in the table to show compliance for all intermediate nominal thicknesses.
 - Test the maximum and a minimum thickness¹ of a range determined as follows:
 - Select any maximum for a range and determine the minimum of the range using the following:
 - At least 30% of the maximum for ranges with a maximum up to .06" (1,5mm)
 - At least 40% of the maximum for ranges with a maximum between .06" (1,5mm) and .25" (6,3mm)
 - At least 48% of the maximum for ranges with a maximum over .25" (6,3mm)**
 - A narrower range than defined by either options is also acceptable.
- ¹ - Thickness could be either the nominal part thickness, nominal core thickness or nominal sandwich thickness (excluding decorative finish from thickness definition), but the comparison must be consistent, core thickness compared to core thickness, or panel thickness compared to panel thickness.

| 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. | |

PS-3 25.853(d) (cont.)

Examples - The following ranges are examples of those that could be defined where testing the minimum and maximum will show compliance for all intermediate thicknesses:

| Subject Thickness Range | Maximum value rational | Minimum value rational |
|-------------------------|--|-------------------------|
| 0.3 mm and 1 mm | 1 mm < .06" => Minimum value must be at least 30% of the maximum value | 0.3 mm is 30% of 1 mm |
| 0.2 mm and 0.5 mm | 0.5 mm < .06" => Minimum value must be at least 30% of the maximum value | 0.2 mm is 40% of 0.5 mm |
| .02" and .06" | .06" = .06" => Minimum value must be at least 30% of the maximum value | .02" is 33% of .06" |
| .04" and .06" | .06" = .06" => Minimum value must be at least 30% of the maximum value | .04" is 66% of .06" |
| .06" and .1" | .1" is > .06" and < .25" => Minimum value must be at least 40% of the maximum value | .06" is 60% of .1" |
| 1.5 mm and 2.5 mm | 2.5 mm > .06" and < .25" => Minimum value must be at least 40% of the maximum value | 1.5 mm is 60% of 2.5 mm |
| .1" and .25" | .25 = .25" => Minimum value must be at least 40% of the maximum value | .1" is 40% of .25" |

| | | |
|---------------------|--|---------------------------|
| 2.5 mm and 6 mm | 6 mm > .06" and < .25" => Minimum value must be at least 40% of the maximum value | 2.5 mm is 42% of 6 mm |
| 5 mm and 6 mm | 6 mm > .06" and < .25" => Minimum value must be at least 40% of the maximum value | 5 mm is 83% of 6 mm |
| .25" and .50" | .50" > .25" => Minimum value must be at least 48% of the maximum value | .25" is 50% of .50" |
| 6 mm and 12.5 mm | 12.5 mm > .25" => Minimum value must be at least 48% of the maximum value | 6 mm is 48% of 12.5 mm |
| .50" and 1.00" | 1.00" > .25" => Minimum value must be at least 48% of the maximum value | .50" is 50% of 1.00" |
| 12.5 mm and 25.5 mm | 25.5 mm > .25" => Minimum value must be at least 48% of the maximum value | 12.5 mm is 49% of 25.5 mm |
| 1.00" and 1.75" | 1.75" > .25" => Minimum value must be at least 48% of the maximum value | 1.00" is 57% of 1.75" |
| 25.5 mm and 44.5 mm | 44.5 mm > .25" => Minimum value must be at least 48% of the maximum value | 25.5 mm is 57% of 44.5 mm |

PS-9 Update

| Ref # | 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. |

PS-10 Update

| Ref # | Feature/ Construction | 25.853(a) Bunsen Burner Test Requirement/Similarity | 25.853(d) Heat Release and Smoke Test Requirement/Similarity |
|-------|--|--|--|
| 10 | Skin testing (Face As Separate Entity) | <p>Sandwich panel faces for panels greater than or equal to 0.25" (6.35 mm) thick may be independently substantiated using data collected from faces of other sandwich panels with a similar face and same core materials.</p> <p>NOTE: Vertical burn data collected from a panel 0.25" (6.35 mm) or less (where the flame is placed either under the panel center or centered under one face) may substantiate a similar face of a thicker panel .25" (6.35 mm) or greater.</p> <p>NOTE: The test coupon is a completed sandwich panel.</p> | Not applicable |

PS-11 Update

| Ref # | 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 or thermoplastic substantiates a panel with the same decorative type with a different texture. | Data from testing one texture of a decorative type or thermoplastic substantiates a panel with the same decorative type with a different texture. |

PS-13 Update

| Ref # | 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™ SL3UL, SL3SL, and SL3L products, testing one color substantiates all other colors because all values have significant margin with respect to the pass/fail criteria for the 12-second and 60 second vertical tests. | Testing each color of synthetic leather/suede material is required. |

PS-14 Update

| Reference Number | Feature / Construction | 25.853 (a) Bunsen Burner Test Requirement/ Similarity | 25.853 (d) Heat Release and Smoke Test Requirement/ Similarity |
|--|------------------------|---|--|
| 14 | Metals ¹ | Unfinished metal parts do not require testing. | Metals with inorganic coatings, non-bonded bare metals and plated metals do not need to be tested for heat release and smoke. Metals with organic coatings (e.g. primer, paint, corrosion inhibitors) must be tested for heat release and smoke if over the size criteria (see ref. 1). |
| | | Finished metal parts do not require testing, provided standard paint/finishes are used (for example, inorganic finishes, corrosion inhibiting dry films, epoxy or urethane primers and topcoats). | |
| <p>1 - Excluding metals and alloys containing more than 10% Magnesium and those in group one of the periodic table. An approach for certifying magnesium in certain locations can be found in the FAA Fire Test Handbook, chapter XX</p> | | | |

Light blue wording not submitted yet.

PS-15 Update

| 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 a part with one color substantiates any other color with the same powder coat system, provided that 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. |

Would like to eliminate Mg exclusion as it is covered by new compliance test, but not submitted to FAA.



PS-16 Update

- See PS-21 Bonded Items new proposal

PS-20 Update

| Ref # | 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) | <p>The test coupon must replicate the Printed Wiring Board laminate construction; however, either of the following is acceptable;</p> <ul style="list-style-type: none"> • Metal tracings may be excluded from the tested configuration, • Any metal tracings may be used in the test configuration. <p>The test must include all coatings used in the type design, such as solder mask and conformal coating. Testing of the laminate in the thinnest cross section will substantiate thicker constructions made from the same laminate materials and conformal coatings.</p> | No test requirement |

PS-21 Update

- The following method of compliance (MOC) options may be used to substantiate secondarily bonded details (Table 1) or items of similar surface area (Table 2) based on the types of materials being bonded. This MOC also applies to multiple bonded details such as a placard bonded to a metal detail bonded to a panel¹. If the bonded part is small and would not contribute to the propagation of a fire in accordance with appendix F, part I (a)(1)(v), no testing is required for compliance. This MOC can be used in conjunction with other MOCs, including PS₃.
- Secondary bonding is generally applicable to the bonding of previously cured/formed material surfaces. Secondary Bonded constructions include materials bonded with liquid/paste adhesives, adhesive films/double sided tapes (including foam tapes) and reinforced adhesive films/tapes. Option 1 is also acceptable to show compliance for co-cured details (for example, brackets, bosses or inserts) bonded to a composite construction. Secondary Bonded constructions do not include fabricated parts, for example, large material cross-sections that are co-cured, such as honeycomb panel composite constructions, may not be substantiated by testing the skins and core separately.

PS-21 Update (cont.)

Table 1 - Compliance Options for Bonded Details

| Materials to be Bonded | Allowed Bonding Compliance Options |
|--|--|
| A – Single sided adhesive tapes, elastomers and other materials with integral adhesive, thermoplastics less than .015” thick and any details that shrink/melt away from the flame when tested (such as some hook and loop tapes, films, and certain man-made fabrics). | 3 or 4 |
| B – Non-metallic bonded details not covered in A above | 1, 2, 3 or 4 |
| C – Bonded metal details* | Testing of base substrate shows compliance for the bonded construction |

*Doesn't apply to metals with more than 10% magnesium.

PS-21 Update (cont.)

Table 2 – Compliance Options for bonding items of similar surface area

| Materials to be Bonded | Allowed Bonding Compliance Options |
|--|--|
| <p>A – Floor Coverings to flooring</p> <p>(i) Film “moisture” barriers</p> <p>(ii) Floor coverings without integral adhesive coating including; carpets, hard floor coverings, tiles or padding (natural or aramid fiber based) bonded using non-shrinking reinforced adhesive tapes</p> <p>(iii) Same materials as (ii) except bonded using adhesive films, double sided tapes with film or foam reinforcement or contact cements</p> <p>(iv) Floor coverings integrally coated with adhesive including carpets, hard floor coverings, padding (not covered above) or tiles and flexible foam padding bonded using any adhesive or double sided tape.</p> | <p>3 or 4</p> <p>1, 2, 3 or 4</p> <p>2, 3 or 4</p> <p>3 or 4</p> |

PS-21 Update (cont.)

Table 2 – Compliance Options for bonding items of similar surface area (Cont)

| Materials to be Bonded | Allowed Bonding Compliance Options |
|---|---|
| <p>B - Bonding Items of similar Size</p> <ul style="list-style-type: none"> i. Thin Coverings (decorative laminates, textiles and leather, paint systems², etc.) being bonded or applied to a panel¹ ii. Flexible foams, felts, cushioning materials when used for applications other than seat cushions (including when used in combination with items in (i) above). iii. Thick Substrates (Counter tops, Panels, etc.) being bonded to a panel¹ | <p>3 or 4</p> <p>3 or 4</p> <p>1, 2, or 4</p> |
| <p>C – Bonded Metal*</p> | <p>Testing of base substrate shows compliance for the bonded construction</p> |

*Doesn't apply to metals with more than 10% magnesium.

PS-21 Update (cont.)

- 1 – A panel is a large, rigid, self-supporting material used in an aircraft interior of a size requiring compliance to 60 or 12 second vertical burn.
- 2 – Compliance for paint systems must be tested at the maximum allowed thickness used. This doesn't include veneer lacquers/coatings, which must be tested on the wood veneer.

PS-21 Update (cont.)

- Bunsen Burner flammability requirements are shown in each of the compliance options below.
- **OPTION #1**: Adhesive and Substrates tested separately:
- Test the adhesive by itself using a .06" to .25" (1.5 to 6.3 mm) thick nominal 3" x 12" plaque, or a single layer for fabric or foam reinforced tapes³ to 12-second Vertical Bunsen burner (VBB). Test the substrates separately, without adhesive to the applicable requirements in appendix F, part I (a)(1)(i), (a)(1)(ii), (a)(1)(iv) or (a)(1)(v).
- **NOTE:** This MOC is also valid when adhesive is not used and the bonded construction is created from co-curing with a composite panel. For example, a bracket co-cured to a panel during the panel cure can be substantiated by data from the panel and the bracket alone. The resin acts as the adhesive and is substantiated by the panel data.

3 – Only applicable to reinforced fabric and foam tapes that pass by not rapidly shrinking or melting away from the flame.

PS-21 Update (cont.)

- **OPTION #2:** Adhesives evaluated in a thin bonded construction and Substrates tested separately:
- Without adhesive, separately test the substrates to the applicable requirements in appendix F, part I (a)(1)(i), (a)(1)(ii), (a)(1)(iv) or (a)(1)(v). Show compliance of the adhesive using data created when two non-metallic materials are bonded together. At least one of the non-metallic materials shall be less than or equal to 0.25" (6.3 mm) thick to ensure the flame is in contact with the adhesive during the test. Test the adhesive to the least stringent requirement of the two substrates being substantiated, or better. For example, if bonding a large thermoplastic placard to a honeycomb sandwich panel, the panel would be tested to appendix F, part I (a)(1)(i), the placard would be tested to appendix F, part I (a)(1)(ii) and the data for the adhesive between two non-metallic materials must be per appendix F, part I (a)(1)(ii) or the more stringent appendix F, part I (a)(1)(i).

PS-21 Update (cont.)

- **OPTION #3:** Bonding to a thin rigid non-metallic:
- Test the secondarily bonded material or construction with the specified adhesive to a thin rigid nonmetallic (such as a one or two ply epoxy, phenolic or polyester resin impregnated glass, aramid or carbon fabric or a thermoplastic at a thickness of 0.021" (.53 mm) or less, considered worst case) in accordance with the applicable requirements in appendix F, part I (a)(1)(i), (a)(1)(ii), (a)(1)(iv) or (a)(1)(v). Once qualified in this manner, the secondarily bonded material or construction/adhesive combination may be shown compliant on other substrates without further test.
- **OPTION #4:** As Installed Configuration
- Test the "as installed" configuration to the applicable requirements of 25.853(a) appendix F, part I 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.
- **NOTE:** If the base panel is over 0.25" (6.3 mm) thick, the back side would be either tested to the same test requirement, or by using item # 10 (FASE) to the base panel testing.

PS-21 Update (cont.)

Secondary bonded materials that include metal may be shown compliant by testing the thinnest cross section of the metal part/component.⁴ (Not applicable to constructions where the metal identified is co-cured to core.)

A bonded detail can be excluded from testing if one or more of the following are true:

- a) It is a bond line less than or equal to 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 or equal to 2 sq ft in total surface area on a panel surface

4 – For example, a machined from plate metal closet door with an applied decorative laminate may be tested at the thinnest cross section of the machined door to show compliance for the entire metal door.

PS-23 Update

| Ref # | Feature/ Constructio n | 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>(See Appendix Z of FAA report DOT/FAA/TC-12/10)</p> <p>GENERAL NOTE 1: Decorative on the panel over the edge potting does not require any additional certification. Test data from the base panel with the decorative substantiates the decorative in the area over the edge potting.</p> | No test required when edge fill material less than 1" deep into the panel measured from the edges (looking at the panel's face). |

PS-24 Update

- Added two general notes:
 - **GENERAL NOTE 1** : Decorative on the panel over the Bonded Joint does not require additional certification. Test data from the base panel with the decorative substantiates the decorative in the area over the bonded Joint.
 - **GENERAL NOTE 2**: This MOC may be used to show compliance for multi-ditch and pot panels.

PS-26 Update

| Ref # | Feature/ Construction | 25.853(a) Bunsen Burner Test Requirement/Similarity | 25.853(d) Heat Release and Smoke Test Requirement/Similarity |
|-------|---|--|--|
| 26 | Fay Surface sealants and Fillet Seals | No test required | No test required |

PS-27 Update

| Ref # | Feature/ Construction | 25.853(a) Bunsen Burner Test Requirement/Similarity | 25.853(d) Heat Release and Smoke Test Requirement/Similarity |
|-------|-------------------------------|---|--|
| 27 | Backside decorative treatment | <p>Test data from a $\leq 0.25''$ thick panel tested with a decorative (decorative laminate, paint, primer or powder coating) on the backside substantiates the same panel with no decorative on the backside.</p> <p>Test data from a panel tested with two layers decorative (decorative laminate, paint, primer or powder coating) on the backside (e.g. a repair) substantiates a single layer of the same decorative on the backside.</p> | <p>Test data from a panel tested with a decorative (decorative laminate, paint, primer or powder coating) on the backside substantiates the same panel with no decorative on the backside.</p> <p>Test data from a panel tested with two layers decorative (decorative laminate, paint, primer or powder coating) on the backside (e.g. a repair) substantiates a single layer of the same decorative on the backside.</p> |

New Items – In-work

- The following new items are in work, but not yet finalized:
 - 101 - Fastened, non-bonded materials tested separately
 - 105 - Industry specs and the definition of “Same”
 - 106 - Developing future MOCs
 - 108 - Textile color similarity
 - 109 - Testing Stone
 - 110 - Wood veneer similarity

New Items – In-work (cont.)

- 111 - Floor Coverings - Combined with PS-21
- 112 - Metal Bond Primers
- 114 - Additive manufactured parts
- 115 - Crushed Core Panel
- 118 - Leather Similarity
- 119 - Placarding
- 121 – Composite panels substantiating aluminum panels for vertical burn

New Items 118– Leather Color Similarity

- The following are two suggested additions to the policy statement on the topic of natural leather:
- (i) 60 second (F₁) and 12 second (F₂) vertical testing of one dye lot of natural leather substantiates any other dye lot of natural leather with the same color, part number, manufacturer and manufacturing process / chemical treatment.
- (ii) 60 second (F₁) vertical testing of one dye lot of natural leather substantiates any other dye lot of natural leather with the same color, part number, manufacturer and manufacturing process / chemical treatment.
- 12 second (F₂) vertical testing of a natural leather from one manufacturer substantiates any other natural leather from the same manufacturing family, irrespective of part number, color or dye lot.

New Item 115 – Crush Core Panels

| Ref # | Feature/ Construction | 25.853(a) Bunsen Burner Test Requirement/Similarity | 25.853(d) Heat Release and Smoke Test Requirement/Similarity |
|-------|--------------------------|---|---|
| New | Crush Core Panels | Data from a honeycomb crushed-core panel can be used to substantiate a part that is made from the same materials, but is crushed less, that is, with a greater final thickness. | Data from a honeycomb crushed-core panel can be used to substantiate a part that is made from the same materials, but is crushed less, that is, with a greater final thickness. |

New Item 119 - Placarding

| Ref # | Feature/ Construction | 25.853(a) Bunsen Burner Test Requirement/Similarity | 25.853(d) Heat Release and Smoke Test Requirement/Similarity |
|-------|--------------------------|---|--|
| New | Placarding | Testing a printed or non-printed placard substantiates any other printed or non-printed placard of the same base material regardless of print design, print method, or ink chemistry. | 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. |

Item 107 – 45° Degree Applicability

- Add applicability of Policy Statement to 14CFR 25.853(h) and 25.855 (d) Appendix F, Part 1, (a)(1)(i) [45 degree Bunsen Burner test] for the following items:
- PS 1, PS 2, PS 3, PS 4, PS 5, PS 6, PS 7, PS 8, PS 11, PS 12, PS 17, PS 18, PS 22, PS 23, PS 24, PS 25, PS 26 and PS 27

New Items – No plan forward

- The following items were not worked due to lack of interest, time or a sponsor/leader:
 - 102 – Rigid Foam Density
 - 103 – Multiple prepreg layers across multiple foam thicknesses and densities.
 - 104 – UL 94 Vo for 12 sec Vertical burn
 - 116 – Small Part Definition
 - 117 – Low density flexible foam for high density
 - 120 – Electrical wire and cables

A special thanks to our Team Leaders!

| | | |
|-----------------|---------------------------|-------------------|
| Anna Nguyen | Grant Joplin/Andrew Olsen | Asfaw Beyene |
| Bart Mooij | Gwen Garman | Marjan Chini |
| Blake Hall | Hans & Jacques | Martin |
| Charles Nam | Heiko Nuessel | Melanie Prince |
| Chris Boyer | Ingo Weichert | Michael Jensen |
| Chuck Story | Jeff Smith | Michael Miler |
| Chuck Wilson | Jeff Smith/Jason Bertram | Patrick Zimmerman |
| Dan Slaton | Keith Couilliard | Scott Campbell |
| Gilberto Niitsu | Klaus Boesser | Tom Little |
| Glenn Swain | Magno Gil | Steven den Dikken |



Questions?

