**Federal Aviation**
Administration

# Memorandum

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|---|---|
| Date: | Proposed |
| To: | See Distribution |
| From: | Manager, Transport Airplane Directorate, Aircraft Certification Service, ANM-100 |
| Prepared by: | Jeff Gardlin, Aerospace Engineer, ANM-115, 425-227-2136 |
| Subject: | Policy Statement on Flammability Testing of Interior Materials |
| Memo No.: | ANM-115-09-XXX |
| Regulatory Reference: | Part 25, §§ 25.853(a) and (d), and appendix F |


**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.


**Definition of Key Terms**

In the policy statement below, the formatting (*italics*, plain text, or [square brackets]) and terms used ("must," "should," or "recommend") have a specific meaning that is explained in Attachment 1.

**Current Regulatory and Advisory Material**

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

addressing a different test method(s). The flammability requirements apply to all materials, except for "*small parts…that would not contribute significantly to the propagation of a fire….*"

Neither the regulations nor the AC contain detailed descriptions of parts and installations to the extent that they capture all of the parts and materials currently found in transport category airplanes. Thus, applicants have historically established what they considered to be the appropriate requirement by identifying the particular provisions of the regulations and guidance that are closest to the actual part. While applicants have made these determinations in good faith, this approach has led to standardization issues. These standardization issues can be difficult to identify, since two installations are seldom, if ever, identical. In fact, what appear to be similar installations may actually have differences that warrant different requirements. Also, in many cases, what appear to be different installations have only slight variations from each other and should meet the same requirements and be tested the same way.

The most significant regulatory language relative to this policy is currently contained in *appendix F, part I, paragraph (b)(2)* as follows: "*…materials must be tested either as a section cut from a fabricated part as installed in the airplane or as a specimen simulating a cut section, such as a specimen cut from a flat sheet of the material or a model of the fabricated part.*" The same paragraph also states: "*The specimen may be cut from any location in a fabricated part; however, fabricated units, such as sandwich panels, may not be separated for test….The edge to which the burner flame is applied must not consist of the finished or protected edge of the specimen but must be representative of the actual cross-section of the material or part as installed in the airplane.*"

**Relevant Past Practice**

When conducting flammability testing, the most common practice is to test the critical case. Much of the guidance and existing methods of compliance are aimed at identifying the critical case for a certain family of variations, e.g., color, and then testing only that case. In some situations, testing is intended to envelope a range of variations, e.g., panel thickness. The remaining variants are then qualified by comparison with the more critical case. This is because the number of permutations of parts and materials would be numerous and could make the flammability test program unmanageable if each combination had to be tested. For some variations, tests have to be conducted because it is not obvious what the critical case is or if the variation has any influence on flammability.

Besides the challenges regarding tests to identify the most critical case, the following requirements for the test specimen, stated in appendix F, part I, have caused confusion:

- It must be tested as a section cut from a part,
- It may be cut from any location, and
- The finished or protected edge must not be included.

Section 25.853 and appendix F, part I, are clear that the intent is to address the cross section of the part or material, and not to test panels with protected edges. This has led some to conclude that any edge trim or material is excluded from testing altogether. Similarly, the provision that the test specimen may come from "any" location in the fabricated part has been interpreted to

mean that an applicant can choose a location from which to cut the section. In that case, certain local cross-section differences are ignored in favor of the primary cross-section, to represent the entire construction. The result is that some cross-section constructions are not tested at all. The regulation essentially requires flammability testing of some kind for all interior materials, unless they are small and would not contribute to propagating a fire. This exclusion of "small parts" seems to be the basis whenever materials are not tested.

This combination of different provisions could be interpreted as being in conflict. Applicants and FAA offices have addressed this through various project-specific methods of compliance and case-by-case findings. As noted above, this process has led to differences in methods of compliance and lack of standardization. There is no indication that this lack of standardization has caused significant safety issues, but the potential is there if the guidance continues to lack sufficient details and be open to interpretation.

The existing guidance contained in AC 25-17A remains valid. However, that guidance is not sufficiently detailed to address the variations in material and installation common on transport category airplanes today. Therefore, to provide a more standardized approach, the FAA has reviewed a listing of common design details and established acceptable methods of compliance for each. Many of these methods can be broadly grouped. The FAA hopes to further refine these criteria as a result of public comment and additional testing.

**Policy**

The attached table summarizes acceptable methods of compliance for various constructed parts, construction details, and materials, based on the FAA's technical judgment of what is acceptable and within the scope of current regulations. The listing is based on data supplied by industry regarding the actual methods of compliance being used in service. There are two categories to this guidance, grouped in this order:

1) Methods that are acceptable and can be used as shown.
2) Methods that are expected to be acceptable but require test data to support them.

Items in the second category may be moved to the first category as data are gathered. It is also possible that some of the items in the second category will be removed should data not be provided or provided data do not support their continued use as a general practice. Some items may appear in both categories. There are two possible reasons for this. First, the approach may simply be different for different test methods. Second, there may be an existing acceptable method of compliance that does not require any data, but additional data may justify a different method of compliance. Any detail items not listed will not be the subject of general guidance, but could be pursued by individual applicants with appropriate limitations.

Also, the FAA is interested in developing a method so an adhesive used to join two parts can be qualified on its own and used to join any two parts. This would cover many of the items currently in category 2. The FAA is actively examining different adhesives and developing such a method. While the specific method is not yet defined, the FAA solicits comment on the approach, which would be an alternative to the methods shown for items 28-32 and 34-41.

Since the category 2 items depend on substantiating data, this policy can be implemented as proposed, even if test data are not available during the comment period. Each applicant would have to supply its own supporting data.

**Effect of Policy**

The general policy stated in this document does not constitute a new regulation. The FAA individual who implements policy should follow this policy when it is applicable to a specific project. Whenever a proposed method of compliance is outside this established policy, that individual has to coordinate it with the policy issuing office using an issue paper. Similarly, if the implementing office becomes aware of reasons that an applicant's proposal that meets this policy should not be approved, the office must coordinate its response with the policy issuing office. Note that established methods of compliance are supported by test data.

Whenever a proposed method of compliance is outside this established policy, the project aircraft certification office has to coordinate it with the policy issuing office using an issue paper. Similarly, if the project aircraft certification office becomes aware of reasons that an applicant's proposal that meets this policy should not be approved, the office must coordinate its response with the policy issuing office. Applicants should expect that certificating officials would consider this information when making findings of compliance relevant to new certificate actions. In addition, as with all guidance material, this policy statement identifies one means, but not the only means, of compliance.

**Implementation**

This policy discusses compliance methods that should be applied to type certificate, amended type certificate, supplemental type certificate, and amended supplemental type certification programs. The compliance methods apply to those programs with an application date that is on or after the effective date of the final policy. If the date of application precedes the effective date of the final policy, and the methods of compliance have already been coordinated with and approved by the FAA or its designee, the applicant may choose to either follow the previously acceptable methods of compliance or follow the guidance contained in this policy.

This policy is the subject of continuing study by both the FAA and industry, and new test data are continuously being generated. We recognize that time is needed to gather all the substantiating data referenced in part 2 of Attachment 2. Therefore, we intend to allow a reasonable time (which may extend after issuance of the policy) for all data to be submitted to support those items in part 2 of Attachment 2. We consider that this notice of proposed policy serves as the trigger to begin developing the necessary data. We specifically solicit comments on what would be a suitable time for implementation. We intend to have default time for all data, unless an applicant can show that the default time is not reasonable in a particular case. In those instances, a longer time may be acceptable but will be developed in an issue paper that is coordinated with the FAA Transport Standards Staff. Other methods of compliance will need to be coordinated with the FAA.

**Conclusion**

The methods of compliance proposed in this policy supplement existing methods of compliance and expand the policy to cover many more types of material and part variations.

[Signed when final]

Attachment 1: Definition of Key Terms

Attachment 2: Acceptable Methods of Compliance for § 25.853

**Distribution List**:
Manager, Los Angeles Aircraft Certification Office, ANM-100L
Manager, Denver Aircraft Certification Office, ANM-100D
Manager, Seattle Aircraft Certification Office, ANM-100S
Manager, Anchorage Aircraft Certification Office, ACE-115N
Manager, Wichita Aircraft Certification Office, ACE-115W
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Manager, Atlanta Aircraft Certification Office, ACE-115A
Manager, Ft. Worth Airplane Certification Office, ASW-150
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Manager, International Branch, ANM-116
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Manager, Small Airplane Directorate Standards Office, ACE-110
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**Definition of Key Terms**

Table A-1 defines the use of key terms in this policy statement. The table describes the intended functional impact, and the formatting used to highlight these items.

- The term "must" refers to a regulatory requirement that is mandatory for design approval. Text communicating a requirement is in *italics*.
- The term "should" refers to instructions for a particular method of compliance. If an applicant wants to deviate from these instructions, he has to coordinate the alternate method of compliance with the Transport Standards Staff using an issue paper. There is no special text formatting used for methods of compliance.
- The term "recommend" refers to a recommended practice that is optional. Enclose recommendations in [ ] brackets.

Table A-1 Definition of Key Terms

| | **Regulatory Requirements** | **Acceptable Methods of Compliance** | **Recommendations** |
|---|---|---|---|
| **Language** | Must | Should | Recommend |
| **Format** | *Italics* | Regular text (No special formatting) | [Square brackets] |
| **Functional Impact** | No Design Approval if not met | Alternative has to be approved by issue paper. | None, because it is optional |

Examples from policy on Power Supply Systems for Portable Electronic Devices (PSS for PED):

- *Even though PSS for PED systems may use wiring that is produced for the consumer market, the wiring must meet the flammability requirements of § 25.869.*
- Although multiple power control switches may be used (e.g., zonal control of system power), there should be a single master switch that allows for the immediate removal of power to the entire PSS for PED
- [We recommend that you provide a means of indication to enable the cabin crew to determine which outlets are in use or which outlets are available for use.]

**Attachment 2 to Policy Memorandum ANM-115-09-XXX**
**Acceptable Methods of Compliance for § 25.853**

## Part 1, acceptable methods without additional data

| 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 test data will substantiate configurations that only require 12-second vertical data. Vertical Bunsen burner data will substantiate configurations that only require horizontal Bunsen burner testing. | Test requirement is decided based on size criteria.<br>1) Test required if greater than 2 sq ft;<br>2) No test if less than 1 sq ft; and<br>3) Specific determination required between 1 and 2 sq ft. |
| 27 | Material versus installation | The part 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. | Not applicable. |
| 2 | Thickness ranges (panels, thermoplastics, foams) | Data from testing a thinner construction substantiates a thicker construction made of the same materials. | See part 2 of this attachment. |
| 8 | 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 a skin buildup is valid for use in any orientation of the same skin ply materials. |

## Part 1, acceptable methods without additional data

| Reference Number | Feature / Construction | 25.853(a) Bunsen Burner Test Requirement/Similarity | 25.853(d) Heat Release and Smoke Test Requirement/Similarity |
|---|---|---|---|
| 9 | Skin testing (FASE - Face As Separate Entity) | Data may be collected from each face of a sandwich panel independently.<br><br>**Note:** The test coupon is a completed sandwich panel. The data from each face may be used to substantiate a panel construction when the panel thickness is greater than 0.25" and the thickness is the only difference between the core materials. | Not applicable. |
| 13 | 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. |
| 14 | Decorative laminate orientation | Data from testing one decorative laminate orientation substantiates a panel with the same decorative laminate That has a different orientation. | See part 2 of this attachment. |
| 15 | Synthetic leather/suede | See part 2 of this attachment. | Testing of each color synthetic leather/suede material is required. |

## Part 1, acceptable methods without additional data

| Reference Number | Feature / Construction | 25.853(a) Bunsen Burner Test Requirement/Similarity | 25.853(d) Heat Release and Smoke Test Requirement/Similarity |
|---|---|---|---|
| 16 | Aluminum/steel/titanium parts (excluding powder coating) | Unless they contain magnesium or magnesium alloys, unfinished metal parts do not require testing.<br><br>Finished metal parts do not require testing provided:<br><br>1) standard paint/finishes are used and<br><br>2) the parts do not contain magnesium or magnesium alloys.<br><br>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. | The test requirement is decided based on size criteria.<br><br>1) Test required if greater than 2 sq ft;<br>2) No test if less than 1 sq ft; and<br>3) Specific determination required between 1 and 2 sq ft. |
| 17 | Powder coated metal | Unless they contain magnesium or magnesium alloys, powder coated metal parts do not require testing. | Testing each color of powder coating material is required. |
| 18 | Decorative laminate on metal skin of sandwich panel | Test the panel with decorative laminate using the appropriate requirement in appendix F, part I. | See part 2 of this attachment. |
| 19 | Metal skinned foam/honeycomb panels | Test the metal skinned foam/honeycomb panel to the appropriate requirement in appendix F, part I. | See part 2 of this attachment. |

## Part 1, acceptable methods without additional data

| Reference Number | Feature / Construction | 25.853(a) Bunsen Burner Test Requirement/Similarity | 25.853(d) Heat Release and Smoke Test Requirement/Similarity |
|---|---|---|---|
| 20 | Embedded metal detail | Test the adhesive by itself or the detail and adhesive together per 12-second vertical.<br><br>Limitation - detail may not be constructed of magnesium or magnesium alloys. | No test requirement. |
| 21 | Edge trim, metal | No test required provided edge trim is at least 0.02" thick. | No test requirement. |
| 22 | Doubler, metal, co-cured | No test requirement. Data from base panel substantiates. | No test requirement.<br>Data from base panel substantiates. |
| 24 | Thermoplastic, thickness ranges | Data from testing a thinner construction substantiates a thicker construction made from the same materials. | It is an acceptable practice to test a given thickness within a tight range and use these data to substantiate all thicker items within that range. See item 2 in this attachment for acceptable thickness ranges. |
| 25 | Clear plastic windows and signs | Test per appendix F, part I, (a)(1)(iv). | No test requirement. |
| 26 | 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 made of the same laminate with thicker constructions. | No test requirement. |

## Part 1, acceptable methods without additional data

| Reference Number | Feature / Construction | 25.853(a) Bunsen Burner Test Requirement/Similarity | 25.853(d) Heat Release and Smoke Test Requirement/Similarity |
|---|---|---|---|
| 28 | Bonded details | See part 2 of this attachment. | The test requirement is decided based on size criteria.<br>1) Test required if greater than 2 sq ft;<br>2) No test if less than 1 sq ft; and<br>3) Further considerations required between 1 and 2 sq ft. |
| 33 | Edge potting and/or edge foam | Test a fabricated section of the panel containing the edge potting compound or foam to 60-second vertical. | See item 28 of this attachment. |
| 43a | Ditch and pot | Test panel and adhesive together (60-second vertical). | See item 28 of this attachment. |
| 43d | Cut and fold | Test panel and adhesive together (60-second vertical). | See item 28 of this attachment. |
| 43b | Tab and slot | See part 2 of this attachment. | No test requirement. |
| 43c | Mortise and tenon | See part 2 of this attachment. | No test requirement. |
| 43e | T-joints | See part 2 of this attachment. | No test requirement. |
| 43f | Bonded pins | See part 2 of this attachment. | No test requirement. |
| 42 | Bonded inserts | Test adhesive to 12-second vertical. | See part 2 of this attachment. |
| 44 | Sealant, fillet seals | See part 2 of this attachment. | No test requirement.<br>Industry has not traditionally tested fillet seals. |

## Part 2, methods of compliance that require supporting data

<table>
<tr><th>Reference Number</th><th>Feature / Construction</th><th>25.853(a) Bunsen Burner Test Requirement/Similarity</th><th>25.853(d) Heat Release and Smoke Test Requirement/Similarity</th></tr>
<tr><td>2</td><td>Thickness ranges (panels, thermoplastics, foams)</td><td>See part 1 of this attachment.</td><td>Except for foam core panels with prepreg skins where each thickness will be tested, use the following approach:<br><br>Sandwich panels, laminates, thermoplastic parts, and parts made from a single material are shown to be compliant with § 25.853(d) (appendix F, parts IV and V) by test, or by similarity to a part with similar thickness (in the same thickness range). For certification purposes, thickness ranges are defined to eliminate the need to test every possible thickness. It is an acceptable practice to test a given thickness within a tight range and use these data to substantiate all thicker items within that range. The following table details standard thickness ranges currently used.
<table>
<tr><th>Type Part</th><th>Thickness Range (inch)</th></tr>
<tr><td rowspan="6">Sandwich Panels - Core Thickness</td><td>0.125 - 0.187</td></tr>
<tr><td>0.188 - 0.249</td></tr>
<tr><td>0.250 - 0.499</td></tr>
<tr><td>0.500 - 0.749</td></tr>
<tr><td>0.750 - 1.749</td></tr>
<tr><td>1.750 and thicker</td></tr>
<tr><td rowspan="10">Laminates and Thermoplastics</td><td>0.020 - 0.039</td></tr>
<tr><td>0.040 - 0.059</td></tr>
<tr><td>0.060 - 0.079</td></tr>
<tr><td>0.080 - 0.099</td></tr>
<tr><td>0.100 - 0.199</td></tr>
<tr><td>0.200 - 0.299</td></tr>
<tr><td>0.300 - 0.499</td></tr>
<tr><td>0.500 - 0.749</td></tr>
<tr><td>0.750 - 1.749</td></tr>
<tr><td>1.750 and thicker</td></tr>
<tr><td rowspan="5">Single Unit Materials</td><td>0.080 - 0.119</td></tr>
<tr><td>0.120 - 0.249</td></tr>
<tr><td>0.250 - 0.499</td></tr>
<tr><td>0.50 - 1.749</td></tr>
<tr><td>1.75 and thicker</td></tr>
</table></td></tr>
</table>

## Part 2, methods of compliance that require supporting data

| Reference Number | Feature / Construction | 25.853(a) Bunsen Burner Test Requirement/Similarity | 25.853(d) Heat Release and Smoke Test Requirement/Similarity |
|---|---|---|---|
| 3 | Core, density | Data from testing a lower density honeycomb core substantiates a higher density honeycomb core, 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. |
| 4 | Core, cell size | Data from testing **ANY** core cell size/shape substantiates other core sell 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 substantiates all cell sizes in between. |
| 5 | Paint/Ink systems | Test the part with same chemistry paint/ink system. Test of one color substantiates other colors of the same paint/ink system. Substantiate unpainted with painted panel. | Test of a part with one color substantiates any other color with the same paint/ink chemistry. Additionally, testing of a painted part substantiates an unpainted part with the same construction. |
| 6 | Doublers, non-metallic, co-cured | No test required for same co-cured material as the skin. | Data from testing the thinnest and thickest doublers substantiates the thickness for all doublers in between. |
| 7 | Fiber reinforcement cloth | Test of one fiber reinforcement cloth of a given weight class in a given resin type (e.g., phenolic, epoxy, etc.) substantiates other fiber reinforcement cloth of the same weight class and fiber type provided the weave is the only change. This applies to cloth made from fiberglass, aramid, or carbon. For example, fiberglass weaves 1581, 7781, and 181 are all equivalent within a given weight class. | Weaves within same weight class are equivalent. |

## Part 2, methods of compliance that require supporting data

| Reference Number | Feature / Construction | 25.853(a) Bunsen Burner Test Requirement/Similarity | 25.853(d) Heat Release and Smoke Test Requirement/Similarity |
|---|---|---|---|
| 10 | Surfacing materials (pin-hole filler, sweep and sand, Bondo) | No test requirement when surfacing material is controlled within an approved process specification to assure conformance to flammability requirements, or that these materials do not contribute to the propagation of a fire. | No test requirement when surfacing material is controlled within an approved process specification to assure conformance to flammability requirements, or that these materials do not contribute to the propagation of a fire. |
| 11 | Backside decorative | Test of a panel with a backside decorative substantiates a panel with a backside that has no decorative. | Test of a panel with a backside decorative substantiates a panel with a backside that has no decorative. |
| 12 | Tedlar | Testing of Tedlar® material on a decorative panel substantiates the same panel construction with the same type and thickness of Tedlar® with a different color. | Testing of Tedlar® material on a decorative panel substantiates the same panel construction with the same type and thickness of Tedlar® with a different color. |
| 14 | Decorative laminate orientation | See part 1 of this attachment. | Data from testing one decorative laminate orientation substantiates a panel with the same decorative laminate with a different orientation. |
| 15 | Synthetic leather/suede | Data from testing one synthetic leather/suede material sample will substantiate other colors of the same material. | See part 1 of this attachment. |
| 18 | Decorative laminate on metal skin of sandwich panel | See part 1 of this attachment. | Data from testing a decorative laminate and an adhesive on a nonmetallic panel substantiates a metal skinned panel with the same decorative laminate and adhesive. |
| 19 | Metal skinned foam/honeycomb panels | See part 1 of this attachment. | Data from testing the thinnest and thickest metal skinned panels substantiates the thickness for all panels in between. |

## Part 2, methods of compliance that require supporting data

| Reference Number | Feature / Construction | 25.853(a) Bunsen Burner Test Requirement/Similarity | 25.853(d) Heat Release and Smoke Test Requirement/Similarity |
|---|---|---|---|
| 23 | Color of thermoplastics, elastomers and floor panels | Data from testing an integrally colored material substantiates the same material type and thickness for a different color. | For integrally colored thermoplastics, conduct engineering tests on a variety of colors to determine the most critical color. Conduct a certification test on the color that produces the most critical values. The resulting data can be used to substantiate other colors of the same materials by similarity/critical case analysis. |
| 28 | **BONDED DETAILS** | Unless it can be concluded that the part is small and does not contribute to the propagation of a fire in accordance with Appendix F, Part I (a)(1)(v), testing of the detail, without adhesive, to the appropriate requirement in Appendix F, Part I (a)(1)(ii) or (a)(1)(iv) substantiates the bonded configuration. | See part 1, item 28, of this attachment. |
| 29 | Rub strips/trim (chafing and decorative, includes bullnose trim) | See part 2, item 28, of this attachment. | See part 1, item 28, of this attachment. |
| 30 | Edge trim, nonmetallic (includes bullnose edge trim) | See part 2, item 28, of this attachment. | See part 1, item 28, of this attachment. |
| 31 | Hook and Loop | See part 2, item 28, of this attachment. | See part 1, item 28, of this attachment. |
| 32 | Placards | See part 2, item 28, of this attachment. | See part 1, item 28, of this attachment. |
| 33 | Edge potting and/or edge foam | Test a block of foam or potting compound by itself per appendix F - part I, (a)(1)(ii). | See part 1, item 28, of this attachment. |

## Part 2, methods of compliance that require supporting data

| Reference Number | Feature / Construction | 25.853(a) Bunsen Burner Test Requirement/Similarity | 25.853(d) Heat Release and Smoke Test Requirement/Similarity |
|---|---|---|---|
| 34 | Brackets and Clips, metallic or non-metallic | See part 2, item 28, of this attachment. | See part 1, item 28, of this attachment. |
| 35 | Wire raceways (bonded to panel vs. conduit bonded within panel) | See part 2, item 28, of this attachment. | See part 1, item 28, of this attachment. |
| 36 | Kickstrips | See part 2, item 28, of this attachment. | See part 1, item 28, of this attachment. |
| 37 | Felt | See part 2, item 28, of this attachment. | See part 1, item 28, of this attachment. |
| 38 | Grommets | No test requirement per appendix F, part I, (a)(1)(v) (Small Part). | See part 1, item 28, of this attachment. |
| 39 | Doublers, pre-cured | See part 2, item 28, of this attachment. | See part 1, item 28, of this attachment. |
| 40 | Doublers, metal (bonded) | See part 2, item 28, of this attachment. | See part 1, item 28, of this attachment. |
| 41 | Mirrors, plastic | See part 2, item 28, of this attachment.<br><br>**Note:** If the mirror is large enough to be considered part of the wall construction, then the mirror should be tested to appendix F, part I, (a)(1)(i). | See part 1, item 28, of this attachment. |
| 42 | Bonded Inserts | No test required. | No test required. |
| 43 | **Bonded Joint Constructions (tab and slot, mortise and tenon, ditch-n-pot, cut and fold, T-joints, pins, etc.)** | See below. | See below. |
| 43a | Ditch and pot | See part 1 of this attachment. | No test requirement. |

## Part 2, methods of compliance that require supporting data

| Reference Number | Feature / Construction | 25.853(a) Bunsen Burner Test Requirement/Similarity | 25.853(d) Heat Release and Smoke Test Requirement/Similarity |
|---|---|---|---|
| 43b | Tab and slot | No test requirement. Traditionally industry has not tested these features. | See part 1 of this attachment. |
| 43c | Mortise and tenon | No test requirement. Traditionally industry has not tested these features. | See part 1 of this attachment. |
| 43d | Cut and fold | See part 1 of this attachment. | No test requirement. |
| 43e | T-joints | No test requirement. Traditionally industry has not tested these features. | See part 1 of this attachment. |
| 43f | Pins | No test requirement. | See part 1 of this attachment. |
| 44 | Sealant, fillet seals | No test requirement. | See part 1 of this attachment. |