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Flammability Methods of Compliance for Boeing Suppliers

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AUTHOR:	Ricardo Andrade Aguilar (Signature on file)	66-ZB-7008 Org. Number	05-05-11 Date
APPROVAL:	Susan Glicksberg, BCA Flammability Compliance Manager (AR) (Signature on file)	66-ZB-7008 Org. Number	5-11-11 Date
APPROVAL:	Kendall Krieg, BCA Flammability Compliance Manager (Signature on file)	66-ZB-7003 Org. Number	06-02-11 Date
CONCURRENCE:	James Kowng for Chirstine Thompson RA Concurrence (Signature on file)	66-ZB-F100 Org. Number	5-17-11 Date
DOCUMENT RELEASE:	Charlene J. Gerken	9M-ST-EUBO Org. Number	6-6-11 Date

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1. Introduction

1.1 Purpose

This document identifies flammability Methods of Compliance (MOC) for Boeing Suppliers. These MOCs have been accepted by the Regulatory Administration and the FAA Organization Management Team (OMT) for use on Boeing certification projects. The use of these MOCs is only allowed for suppliers that use the process specifications identified in the MOCs.

1.2 Scope

The criteria contained in this document are established and maintained by BCA Flammability, the Regulatory Administration, and the FAA. The requirements contained herein pertain to all newly defined and sustaining programs.

1.3 Abbreviations

AC	Advisor Circular
AR	Authorized Representative
BDCO	BCA Delegated Compliance Organization (Now Regulatory Administration
CFR	Code of Federal Regulations
ELT	Emergency Locator Transmitters
FAA	Federal Aviation Administration
MOC	Method of Compliance
OMT	Organization Management Team
PWB	Printed Wiring Boards
RA	Regulatory Administration
STC	Supplemental Type Certificate
SD	Smoke Density
HR	Heat Release

2. References

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2.1 Applicability of Methods of Compliance to FAA Regulations:

Method of Compliance	25.853 (a)	25.853 (c)	25.853 (d)	25.855 (c)	25.855 (d)	SSC
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3.36 Color of Decoratives Laminates	X		X			
3.37 Color of Thermoplastics	X					
3.38 Color Nonmetallic Materials Not Required to Meet Smoke and Heat Release	X				X	
3.40 Hook and Loop Tape on Interior Parts			X			
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Method of Compliance	25.853 (a)	25.853 (c)	25.853 (d)	25.855 (c)	25.855 (d)	25.856 (a)	25.856 (b)
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Method of Compliance	25.853 (a)	25.853 (c)	25.853 (d)	25.855 (c)	25.855 (d)	25.856 (a)	25.856 (b)
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5.4 Tape						X	
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3. Bunsen Burner, Heat Release and Smoke Methods of Compliance

3.1 Small Parts

A part may be classified as a small part, meeting the part 25 requirements if it meets size and spacing criteria defined below:

Size Criteria

- Parts made of materials that are typically used in the construction of airplane parts or are made from materials with known acceptable relative fire properties must not have a single surface greater than 9 square inches and no single dimension greater than 6 inches.
- If the relative fire properties of the part's material are unknown the part must fit into a volume of 2 by 2 by 2 inches or 3 by 3 by 0.5 inches.

Note: The material and/or part may not be wadded up, compressed, or otherwise manipulated to fit within the size criteria.

Spacing Criteria

- Spacing criteria does not apply when the part is made of materials that are typically used in the construction of airplane parts or are made from materials with known acceptable relative fire properties.
- If the relative fire properties of the part's material are unknown they must not be spaced closer than 12 inches to one another.

A Flammability Authorized Representative (AR) may determine that a part which slightly violates the size or spacing criteria defined above does not affect the burning behavior and may be considered a "small part".

There are relatively few of these parts on an airplane.

The part is installed in a location on the airplane where other parts installed nearby are compliant with applicable part 25 requirements for flammability,14 CFR 25.853, 25.855, and 25.869*. Nearby is considered a situation where any part may be negatively affected by the burning behavior of the subject small part.

Due to the geometry of the part, testing the part cannot be accomplished easily. If a specimen of ample size can be cut from the fabricated part, then the part shall be tested in accordance with Appendix F, Part I (b) (2), amendment 25-111.

Taking a part which does not meet the size criteria and dividing it into smaller parts which do meet the size criteria in order to avoid testing does not meet the intent of this MoC.

* This small part criterion does not apply for parts that have to meet 14 CFR 25.869

[Regulation] 14 CFR 25.853 (a) (Appendix F, Part I) and 25.855(d) (Appendix F, Part I (a)(1)(ii)

[FAA Acceptance] This method of compliance was proposed by the Boeing Company to the organization management team (OMT) and approved via reference RA-17-03407.

3.2 Core Thickness Options

Core that is 0.47-inch thick is optional to 0.50-inch thick core in test panels.

For parts with 0.47-inch thick BMS8-124, Type V, Class 4, grade 3.0 honeycomb core, the following options may be used to show compliance:

- Test per 14 CFR 25.853 (a) and (d) (Appendix F, Parts I, IV, and V) .
- Data from samples made with 0.25-inch thick core may be used to show compliance with 14 CFR 25.853 (a) and (d) (Appendix F, Parts I, IV, and V) Conditions through application of thickness ranges, as accepted in FAA letter 150S-06-268.
- Data from samples built with 0.50-inch thick core may be used to show compliance with 14 CFR 25.853 (a) and (d) (Appendix F, Parts I, IV, and V).

[Regulation] 14 CFR 25.853 (a) and (d) (Appendix F, Parts I, IV, and V);

3.3 ABCO 2449 and ABCO 2449HT

Parts made from ABCO 2449 urethane thermoplastic material may be shown to be compliant with 14 CFR 25.853 (a) (Appendix F, Part I) by test, or by similarity to testing of ABCO 2449 HT urethane thermoplastic. Likewise, parts made from ABCO 2449 HT may be shown to be compliant with 14 CFR 25.853 (a) by test, or by similarity to testing of ABCO 2449.

[Regulation] 14 CFR 25.853 (a) (Appendix F, Part I)

3.4 Kick Strips

Thermoplastic kick strips up to 4-inches wide (the dimension perpendicular to the floor) are not required to show compliance with 14 CFR 25.853 (d) but are required

to show compliance with 14 CFR 25.853 (a) (Appendix F, Part I (a) (1) (ii)). This MOC applies only to the thermoplastic kick strips installed at floor level.

[Regulation] 14 CFR 25.853 (a) and (d) (Appendix F, Parts I, IV, and V)

3.5 Parts Installed Below Passenger Floor

Compliance to 14 CFR 25.853 (a), (c), (d), and 14 CFR 25.855 (c) and (d) is not required for parts installed below the main deck floor with exception of the following:

- Thermal/acoustic insulation
- Air ducting and air duct joints
- Cargo liners, cargo flooring
- Cargo tie-down equipment
- Electrical wire insulation
- Insulation blankets and covers used to protect cargo.

These regulations address materials installed within an airplane compartment interior and cargo or baggage compartments. Examples of items not requiring compliance findings include the following:

- Electronic equipment bay components
- Miscellaneous plastic brackets or pulleys
- Rigid or flexible drain lines
- Potable water lines
- Drip shields and drip pans
- Wire trays
- Bilge trays and other insulation blanket supports
- Leveling compound
- Protective shrouds not part of a liner or liner design feature
- Cargo handling system
- Nonmetallic floor beams maintaining the same level of safety as metallic floor beams

[Regulation] 14 CFR 25.853 (a), (c), (d), and 14 CFR 25.855 (c) and (d)

3.6 BMS10-83

Parts finished with BMS10-83, Type II enamel are shown to be compliant with 14 CFR 25.853 (a) and (d) (Appendix F, Parts I, IV, and V) by test, or by similarity to testing of a part finished with BMS10-83, Type III enamel. Likewise, parts finished with BMS10-83, Type III enamel are shown to be compliant by test, or by similarity

to testing with Type II enamel. Parts using BMS10-83, Type IV primer are shown to be compliant by test, or by similarity to testing with Type I primer. Test data for Type IV primer cannot be used to show compliance of parts with Type I primer. Data used for similarity testing are from equivalent configurations; that is, they may have minor differences, but only within the limits set by other methods of compliance.

Table 1. Summary of Compliant Materials.

Material Defined on Type Design:	**Compliant by test or similarity to:**
BMS 10-83 Ty II	BMS 10-83 TyIII
BMS 10-83 Ty III	BMS 10-83 TyII
BMS 10-83 Ty IV	BMS 10-83 Ty I
BMS 10-83 Ty 1	Not Compliant by test or similarity to BMS 10-83 Ty IV

[Regulation] 14 CFR 25.853 (a) and (d) (Appendix F, Parts I, IV, and V)

[FAA Acceptance] This method of compliance was proposed by BDCO in reference 06-01901 and accepted by the OMT in reference 150S-06-434.

3.7 Paint Color

Note: MOC 3.7 is not to be used after November 8, 2013. Use Policy Statement PS-ANM-25.853-01-R2 Reference Number 7, Paint Color, instead.

Painted parts are shown to be compliant with 14 CFR 25.853 (a) and (d), (Appendix F, Parts I, IV, and V) by test, or by similarity to a part with an equivalent configuration but a different color of paint. Equivalent configurations may have minor differences, but only within the limits set by FAA-accepted Methods of Compliance.

For 25.853 (a), (Appendix F, Part I), this MOC is valid only for coatings listed on BMS10-83 as of QPL Revision 12-Jun-2007. Flammability equivalency data on new paints will be submitted to the FAA for approval prior to updating the MOC. Changes to company names and addresses will not affect this MOC. This MOC authorizes the use of similarity data from specimens with a different color of paint, but it does not authorize the use of data from another classification of finish. Any equivalent specification classifications will be proposed in separate MOCs.

This MOC applies only to configuration where the test data has significant margin compared to the regulatory requirement.

Data Margin:

- Heat release data shall have a 15 point margin (average test values not exceeding 50/50).
- Smoke shall have a 15 point margin (average test data not exceeding 185).
- Bunsen burner data shall have a minimum margin of 2 inches burn length and 5 seconds extinguish time compared to the regulatory requirement.

Example:

For a panel required to meet 60-second vertical, the burn length would not exceed 4 inches, and the extinguish time would not exceed 10 seconds. Data for a painted part required to meet 12-second vertical would not exceed 6 inches burn length or 10 seconds extinguish time. This MOC will not be used for configurations which drip.

[Regulation] 14 CFR 25.853 (a) (Appendix F, Part I)

3.8 Equivalent Weaves

Equivalent Weaves, fiberglass and carbon fiber fabrics are made in different weaves. The table below shows weaves that are considered equivalent in fiber reinforced composites for compliance to 14 CFR 25.853 (a) and (d) (Appendix F, Parts I, IV, and V).

Equivalent Material Weaves

Material	**BMS Specification**	***Equivalent Weaves***
Fiberglass	8-222, 8-226	*181, 1581, 7781*
Aramid	8-264	*181, 285*
Carbon	*8-274*	*3K-70-PW, 3K-70-CS*

[Regulation] 14 CFR 25.853 (a) and (d) (Appendix F, Parts I, IV, and V)

3.9 Multiple Thicknesses in a Part Made from a Single Material

Parts made from multiple thicknesses of a single material are shown to be compliant with 14 CFR 25.853 (a) (Appendix F, Part I) by testing of the thinnest cross section. Examples of multiple thicknesses of a single material are a molded thermoplastic part or a composite part having an area with extra plies, such as a co-cured doubler. Testing of only the thinnest cross-section applies to parts tested in accordance with 14 CFR 25.853 (a) (Appendix F, Part I), (a) (1) (i), (ii), (iv), and (v).

Note: Doublers refer to laminates only.

[Regulation] 14 CFR 25.853 (a) (Appendix F, Part I)

3.10 Thickness Ranges (Parts Requiring Heat Release and Smoke)

Sandwich panels, laminates, thermoplastic parts, and parts made from a single material are shown to be compliant with 14 CFR 25.853 (a) and (d) (Appendix F, Parts I, IV, and V) by test, or by similarity to a part with similar thickness (in the same thickness range). Thickness ranges are defined for certification purposes to eliminate the need to test every possible thickness. It is Boeing practice to test the thinnest samples in a tight range and use these data to substantiate all designs in that range. The following table details standard thickness ranges currently used.

Table 2. Thickness Ranges for Sandwich, Laminate, Thermoplastic and Single Unit Material

Type Part	Tested Thickness (in)	Thickness Range (in)
Sandwich Panels-Core Thickness	0.125	0.125-0.187
	0.188	0.188-0.249
	0.25	0.250-0.499
	0.5	0.500-0.749
	0.75	0.75-1.749
	1.75	1.750 and thicker
Laminates and Thermoplastics	0.02	0.020-0.039
	0.04	0.040-0.059
	0.06	0.060-0.079
	0.08	0.080-0.099
	0.1	0.100-0.199
	0.2	0.200-0.299
	0.3	0.300-0.499
	0.5	0.500-0.749
	0.75	0.750-1.749
	1.75	1.750 and thicker
Single Unit Materials	0.08	0.080-0.119
	0.12	0.120-0.249
	0.25	0.250-0.499
	0.5	0.500-1.749
	1.75	1.750 and thicker

This MOC is not applicable to foam core sandwich panels. Each thickness must be tested.

[Regulation] 14 CFR 25.853 (a) and (d) (Appendix F, Parts I, IV, and V)

3.11 Panels over Panels

Panels not exposed to the passenger cabin (because they have large panels covering them or are back to back with other large panels or units such as galleys, modular lavatories and closets) need only to be shown compliant with 14 CFR 25.853 (a) (Appendix F, Part I (a) (1) (i)). This method of compliance (MOC) does not apply to panels bonded together, or décor panels mounted on monuments, as they would be tested together to 14 CFR 25.853 (d) (Appendix F, Parts IV and V).

[Regulation] 14 CFR 25.853 (a) (Appendix F, Part I (a) (1) (i))

3.12 Placards

Placards controlled by the following Boeing Process Specifications:

- BAC5316 Type P
- BAC5316, Type K
- BAC5316, Type F
- BAC5875, Type II

show compliance to 14 CFRs 25.853 (a) (Appendix F, Part I) and 25.855(d) (Appendix F, Part I (a)(1)(ii)) by test of the representative configuration of the part, including the placard material with self-adhesive, or by using data from samples fabricated with the representative placard attached with the placard's self-adhesive to BMS8-2, Type 13 cargo liner.

[Regulation] 14 CFR 25.853 (a) (Appendix F, Part I) and 25.855(d) (Appendix F, Part I (a)(1)(ii))

3.13 [intentionally left blank]

3.14 Safety Equipment in F2 Containers

Aircraft emergency, survival, and safety equipment stowed in a nonmetallic container which meets, at a minimum 12-sec vertical Bunsen burner, does not require testing to show compliance to 14 CFR 25.853 (a) (Appendix F, Part I). Articles stowed in such containers need not meet any particular fire property requirement provided they are intended for use under any or all of the following categories:

- Emergency (for example, first aid kit, fire fighting gloves, etc.)
- Survival (for example, water bags, life raft, life raft oars, life vests, etc.)
- Safety (for example, seat belt extensions, emergency equipment demonstration kit, etc.)

[Regulation] 14 CFR 25.853 (a) (Appendix F, Part I)

3.15 [Intentionally left blank]

3.16 Software Media Holders

Compliance to 14 CFR 25.853 (a) for software media holders is demonstrated by minimizing their contribution to a fire. This is accomplished by establishing adequate storage and processes outlining the use of this material. Boeing Letter B-H340-01-

4488 addresses the processes by which the software media binders are either contained or removed from the aircraft just prior to delivery.

[Regulation] 14 CFR 25.853 (a)

3.17 Sun Visors

Flight deck sun visors shall comply with 14 CFR 25.853 (a) (Appendix F, Part I (a) (1) (iv)). The sun visor is classified as a subparagraph (iv) material when the following conditions are met:

- The sun visor materials are clear or almost clear and are acting as a window.
- The sun visor contains no other materials such as a thermoplastic frame or a bezel.

If the visor contains materials which are not "clear or almost clear" such as a bezel or frame around the periphery of the visor, the parts of the visor which are not clear or almost clear shall be tested separately, and shall comply with 14 CFR 25.853 (a) (Appendix F, Part I (a) (1) (ii))

[Regulation] 14 CFR 25.853 (a) (Appendix F, Part I (a) (1) (iv))

3.18 Fire Extinguishers and ELTs

Fire extinguishers and Emergency Locator Transmitters (ELT) do not require testing to show compliance with 14 CFR 25.853 (a) (Appendix F, Part I). Fire extinguishers and ELTs are mandatory safety equipment deemed to be critical to the safety of the aircraft. Nonmetallic brackets used to support safety equipment are required to show compliance with 14 CFR 25.853 (a).

[Regulation] 14 CFR 25.853 (a) (Appendix F, Part I)

3.19 Fully Enclosed Metal Boxes

Items inside a fully enclosed box do not require testing to show compliance with 14 CFR 25.853 (a) and 14 CFR 25.856 (a) (Appendix F, Parts I and VI). **A fully enclosed box is defined as an enclosure made of metal or glass without ventilation (other materials are acceptable with AR approval). Openings in the box required for functionality of the internal components, such as an opening for wiring, must be sized appropriately. Drain holes and other small gaps are acceptable with AR approval.*** MOC justification is based on FAA letter 120S-00-509, SACO concurrence with B-H360-05-0897, Advisory Circular 25-17a, paragraph 632b (1) and Advisory Circular 25.856-1. Liquid crystal display monitors are not included in this determination. See section 3.21 for guidance on LCD monitors.

***Fully enclosed metal box clarification.**

[Regulation] 14 CFR 25.853 (a) (Appendix F, Part I) and 14 CFR 25.856 (a) (Appendix F, Part VI)

3.20 Thread

Parts made from fabric (such as cloth, leather, and Naugahyde) or webbing are shown to be compliant to 14 CFR 25.853 (a) (Appendix F, Part I) by test. Stitched areas (including serging, seams, and stitched hems, **and non-decorative embroidery*** but not decorative embroidery) on such parts can be shown to be compliant by similarity to tests of fabric or webbing without stitching. This method of compliance only applies to certification to 14 CFR 25.853 (a).

***Added clarification**

[Regulation] 14 CFR 25.853 (a) (Appendix F, Part I)

3.21 Unvented LCD Monitors

LCD monitors with a glass face and an unvented metal shroud do not require testing to show compliance with 14 CFR 25.853 (a) and (d) (Appendix F, Parts I, IV, and V) in accordance with guidance provided in Advisory Circular 25-17, paragraph 623b (1). A monitor with a glass face and metal shroud can be considered a five-sided metal box with glass face and does not require fire properties test data for internal components.

For monitors greater than 1 square foot, the glass face must meet heat release and smoke requirements. Additionally, the glass face must remain intact, except for minor cracking, during heat release testing.

[Regulation] 14 CFR 25.853 (a) and (d) (Appendix F, Parts I, IV, and V)

3.22 [Intentionally left blank]

3.23 Vertical Data for Horizontal Data and F1 Data for F2 Data

Configurations which have been tested for 60-second vertical and have passed need not be retested to the less-stringent requirements of 12-second vertical. Likewise, configurations which have been tested for the more stringent vertical Bunsen burner test requirements and passed need not be retested to the less stringent horizontal Bunsen burner test.

[Regulation] 14 CFR Part 25.853 (a) and 25.855(d) (Appendix F, Part I (a) (1) (i), (ii), (iv), and (v))

3.24 [Intentionally left blank]

3.25 [Intentionally left blank]

3.26 [Intentionally left blank]

3.27 [Intentionally left blank]

3.28 [Intentionally left blank]

3.29 [Intentionally left blank]

3.30 Printed Wiring Boards

Printed wiring boards (PWB) are shown to be compliant with 14 CFR 25.853 (a) by test or by similarity to tests performed in accordance with D6-83083, Revision E.

[Regulation] 14 CFR 25.853 (a) (Appendix F, Part I (a) (1) (ii))

3.31 Backside Decorated to Substantiate Backside Undecorated

A construction with an undecorated backside is shown to be compliant with 14 CFR 25.853 (a) and (d) (Appendix F, Parts I, IV, and V by test or by similarity to a construction with a decorated backside. The backside is the non-test face of a construction required to meet 14 CFR 25.853 (a) and (d). Data used for similarity testing is from equivalent configurations; that is, they may have minor differences, but only within the limits set by other Methods of Compliance. This proposal is limited to panels covered with the following test side and back side decorative materials:

1. BAC5596 Type II Hard (Rigid) Decorative Laminate
2. BAC5596 Type IVa Single Flexible Decorative Laminate
3. BAC5596 Type IVb Single Flexible SP Decorative Laminate
4. BAC5596 Type VIa Double Flexible Decorative Laminate
5. BAC5596 Type VIb Double Flexible SP Decorative Laminate
6. BAC5596 Type VIII Compound Contour Laminate
7. BAC5596 Type XXa Reinforced Decorative Laminate

8. BAC5596 Type XXb Reinforced Decorative Laminate
9. BAC5596 Type XXI Duradec Laminate
10. BAC5596 Type XXII Duradec with Pressure Sensitive Adhesive
11. BAC5596 Type XXIII Ink Jet Single Flexible Decorative Laminate
12. BAC5596 Type XXIV Ink Jet Double Flexible Decorative Laminate
13. BAC5596 Type XXVII Heat Activated Single Flexible Decorative Laminate
14. BAC5596 Type XXVIII Heat Activated Double Flexible Decorative Laminate
15. BAC5596 Type XXIX Next Generation Flexible Decorative Laminate
16. BAC5596 Type XXX Heat Activated Next Generation Flexible Decorative Laminate
17. BMS8-98 Polyvinyl Fluoride Film (Types III, IVA, IVB, IXA, IXB)
18. DMS2290 Type I, Class 1 and 3, Abrasion Resistant Decorative Laminates
19. DMS2291 Type I and II, Class 1 and 2, Grade A, Decorative Laminate, Low Smoke and Heat Release
20. DMS2415 Class 1 and 3 Decorative Laminates, High Formability, Low Heat & Low Smoke Release
21. BMS10-83 Interior Decorative Urethane Paint System
22. DPM5391 and 5391-1 series Interior Polyurethane Coating
23. DPM5948 and 5948-1 series Interior Water Base Coatings
24. DPM5949 series Lusterless Water Base Finish

[Regulation] 14 CFR 25.853 (a) and (d) (Appendix F, Parts I, IV, and V)

3.32 Rub Strips/Chafing Strips

Thermoplastic rub strips are shown to meet the requirements of 14 CFR 25.853 (a) (Appendix F, Part I (a) (1) (ii)). When the rub strip area on a single monument surface[1] is less than 2 square feet, the rub strip need not be included in the test article used to demonstrate compliance with 25.853 (d). Each surface shall be considered separately and each side of the panel shall be considered a separate surface. The rub strip area shall be calculated by adding the area of all rub strips on a single surface. The rub strip area shall be calculated by adding the area of all rub strips on a single surface. Corner rub strips located on the vertical edges of monument panels that extend less than 2 inches from the panel edge are not included in the rub strip surface area in consideration of compliance with paragraph 25.853 (d). Corner rub strips are considered individually for compliance with paragraph 25.853 (d). If the individual vertical corner rub strip exceeds 288 square inches in surface area, it shall comply with FAR 25.853 (d).

Note:[1] A surface is a single panel or multiple individual panels that butt together with minimal or no gap to provide a continuous surface in one plane. Panels that join together in different planes are considered to be separate surfaces. For example, 2 panels forming a 90 degree joint are different surfaces.

Rub strips are typically long, narrow parts, with one or more parts installed on a panel. Where more than one rub strip is installed on a panel, there is typically significant space between the rub strips. If an unusual installation were designed where the rub strips were concentrated in a local area of the panel, this MOC would not be applied without additional coordination with the FAA.

[Regulation] 14 CFR 25.853 (a) and (d) (Appendix F, Parts I, IV, and V)

3.33 Interior Panels

For compliance to 25.853(d)

Interior panels that are required to meet 14 CFR 25.853 (d) (Appendix F, Parts IV and V) are shown to be compliant by testing the basic panel configuration (thermoplastic or thermoset laminate or sandwich) together with any decorative laminates used in the design.

Testing shall not include:

- Panel edges (2 inches from the panel edge) which contain foam core, potting compound and/or doublers.*
- Field reinforcement (doublers* not within 2 inches of the panel edge) totaling no more than 144 square inches per panel.
- Potted inserts.

*Doublers refers to co-cured reinforcement plies

For compliance to 25.853(a)

Interior panels that are required to meet 14 CFR 25.853 (a) (Appendix F, Part I) are shown to be compliant by testing the basic panel configuration (thermoplastic or thermoset laminate or sandwich) together with any decorative laminates used in the design.

Testing shall not include:

- Panel edges (2 inches from the panel edge) which contain foam core or potting compound
- Potted inserts.

Compliance of the edge configuration and insert potting with 14 CFR 25.853 (a) is shown by similarity to the basic panel configuration and to data representative of potted configurations and foam edge configurations, provided to the FAA with the letters proposing the MOC. Edges and corners formed by foaming in place or by routing and then potting (called ditch and pot) are included as edges.

For 25.853 (a), this MOC applies only epoxy-resin and phenolic-resin panels that use BMS8-133 edge-foam materials and/or the following potting compounds and adhesives which meet 12-second or 60-second vertical when tested alone at 0.125-inch thick:

- Epoxy-based BMS5-28 (Types 6, 9, 10, 13, 15, 17, 18, 19, 24, 25, 28, and 29)
- Huntsman XNR6101/XNH6101
- Heath Tecna HMS C2-001-1-2-A
- Heath Tecna HMS C2-001-1-2-D
- AAR Composites ATR-1000
- Huntsman Epocast 1610
- 3M DP100
- H.B. Fuller EY-2536 A/B
- Euro-Composites Epoxy Paste Adhesive EC662 B/A FST
- Euro-Composites Epoxy Void Filler EC 631FST
- Axson Epoxy Structural Adhesive XE 2313/2
- Scotch-Weld 9300 B/A FST
- Magnabond 128-125A/B
- JD Lincoln L-318FR/EC
- Aerobond 1508 A/B (as insert potting only)
- Epocast 1618-D/B
- Magnolia 127-033 A/B
- Magnolia 5925 A/B

BMS8-133 materials meet 60-second vertical when tested at 0.5-inch thick. This MOC also applies to the same potting and foam materials if specified by vendor designation rather than by the BMS specification. In the case of potting compounds, addition of milled glass fibers, CAB-O-SIL, or other inert materials as thickeners is acceptable without providing additional data.

This method of compliance would be used for panels where the basic configuration has a 2-inch margin in burn length and a 5-second margin in extinguish time. This MOC would not be used for configurations which drip. Additionally, this MOC does not apply to insert potting which exceeds 3 inches in diameter.

[Regulation] 14 CFR 25.853 (a) and (d) (Appendix F, Parts I, IV, and V)

3.34 Metallic Parts with Standard Finishes and Powder Coating

Note: MOC 3.34 is not to be used. Use Policy Statement PS-ANM-25.853-01-R2 Reference Number 14 or 15, instead.

Compliance to 14 CFR 25.853 (a)(Appendix F, Part I) and 25.855(d) (Appendix F, Part I (a)(1)(ii)) for metallic parts with inorganic coatings has been demonstrated. Compliance to 14 CFR 25.853 (a) (Appendix F, Part I) and 25.855(d) (Appendix F, Part I (a)(1)(ii)) for metallic parts with organic finishes has been demonstrated. Standard finishes are defined as epoxy primers and topcoats, urethane topcoats, corrosion inhibiting dry films, and powder coatings. Standard finishes which are part of the type design on August 10, 2006 have been demonstrated to have typical burn characteristics and therefore require no further testing to show compliance with 14 CFR 25.853 (a).

Note:

- An organic coating is a material made from an organic chemical compound that is applied to a surface (such as primer, paint or powder coat).
- An inorganic coating is a surface treatment that changes the immediate surface layer of a metal into a film of metallic oxide (such as anodize or chromate conversion coatings).

[Regulation] 14 CFR 25.853 (a) (Appendix F, Part I) and 25.855(d) (Appendix F, Part I(a)(1)(ii))

3.35 Adhesives – Small Area Bonding

Parts with a bonded area of 144 square inches or less, or having an adhesive bondline width of 1 inch or less with a total bonded area less than 288 square inches, are shown to be compliant with 25.853 (d) (Appendix F, Parts IV and V) by test of the part configuration but omitting the bonded components. This MOC applies when one or smaller components such as brackets or placards are bonded to a large panel. Any tiling of panels would be substantiated as though they were one panel; in other words, a collection of small panels would be evaluated as though they were one large panel.

Parts incorporating a single bond area less than 9 square inches and parts with multiple bond areas totaling 9 square inches or less are shown to be compliant with 25.853 (a), (Appendix F, Part I) by test or by similarity to data for unbonded substrates having similar constructions. Parts with narrow bond lines (1 inch or less in width) within 2 inches of the edge of the part are likewise shown to be compliant by test or by similarity to data for unbonded substrates with similar constructions, provided the total bond area is less than 288 square inches. For Bunsen burner, this MOC is limited to bonded constructions where results of Bunsen burner tests for both the panel and the unbonded substrate material are 50 percent or less of the regulatory requirement.

Table 3 Compliance to 25.853 (a) and 25.853 (d) Requirements.

Compliance to 25.853(a) by test of the panel without the bonded parts.	Compliance to 25.853 (d) by test of the part configuration without the bonded components.
Bondlines: **≤ 1in narrow and within 2 in of the panel edge** **Bonded Areas:** **≤ 9 sq in**	**Bonded Areas:** **(1) ≤144 sq in or,** **(2) 1 in wide and ≤ 288 sq in**

Interior panels that are required to meet §25.853 (a) and (d) are shown to be compliant by testing the basic panel configuration, which includes the interior facing decorative, the underlying thermoplastic or composite laminate or sandwich panel, and backside decorative (if any). Testing shall not include metallic trim materials bonded to the panel edge. Compliance to § 25.853(a) for metallic trim strips has been demonstrated in accordance with reference (b), MOC 3.34 "Metallic Parts with Standard Finishes and Powder Coating." Compliance to §25.853(d) has been demonstrated using previously generated test data for metallic sheet bonded to a composite sandwich panel.

Limitations:

- The limitation that narrow bond lines are within 2 inches of the part edge applies to Bunsen burner testing, but not to heat release or smoke testing.
- This MOC is limited to bonded constructions where the adhesives used are epoxies, acrylics, urethanes, polyesters, or silicone, nitrile, or chloroprene synthetic rubber.
- Metal edge trim bonded to interior panels is limited to adhesives defined within this MOC. For compliance to 14 CFR 25.853 (a), metal edge trim must be greater than or equal to 0.02 inch thick. For compliance to 14 CFR 25.853 (d), metal edge trim must be greater than or equal to 0.03 inch thick.

[Regulation] 14 CFR 25.853 (a) and (d) (Appendix F, Parts I, IV, and V)

3.36 Color of Decorative Laminates

Parts with decorative laminates are shown to be compliant with 14 CFR 25.853 (a) and (d), (Appendix F, Parts I, IV, and V) by test or by similarity to a panel with equivalent configuration but a different color or pattern of decorative laminate. Parts with an integrally pigmented decorative laminate are shown to be compliant by test or by similarity to testing of an equivalent part with a screen-printed or ink-jet printed decorative laminate. Parts with an ink-jet printed decorative laminate are shown to be compliant by test or by similarity to testing of an equivalent part with a screen-printed decorative laminate. Data used for similarity is from equivalent configurations; that

is, they may have minor differences, but only within the limits set by other means of compliance.

This method of compliance is used for the following decorative laminate types:

1. BAC5596 Type II Hard (Rigid) Decorative Laminate
2. BAC5596 Type IVa Single Flexible Decorative Laminate
3. BAC5596 Type IVb Single Flexible SP Decorative Laminate
4. BAC5596 Type VIa Double Flexible Decorative Laminate
5. BAC5596 Type VIb Double Flexible SP Decorative Laminate
6. BAC5596 Type VII Printed/Opaque Tedlar Aluminum Laminate
7. BAC5596 Type VIII Compound Contour Laminate
8. BAC5596 Type XIII 3.1-Mil Foil Decorative Tedlar Laminate
9. BAC5596 Type XIV 3.1-Mil Foil Wallpaper Decorative Laminate
10. BAC5596 Type XVIa Tedlar Aluminum Laminate
11. BAC5596 Type XVIb Tedlar Aluminum Laminate
12. BAC5596 Type XXa Reinforced Decorative Laminate
13. BAC5596 Type XXb Reinforced Decorative Laminate
14. BAC5596 Type XXI Duradec
15. BAC5596 Type XXII Duradec with Pressure Sensitive Adhesive
16. BAC5596 Type XXIII Ink Jet Single Flexible Decorative Laminate
17. BAC5596 Type XXIV Ink Jet Double Flexible Decorative Laminate
18. BAC5596 Type XXV Ink Jet Foil Decorative Laminate
19. BAC5596 Type XXVI Ink Jet Foil Wallpaper Decorative Laminate
20. BAC5596 Type XXVII Heat Activated Single Flexible Decorative Laminate
21. BAC5596 Type XXVIII Heat Activated Double Flexible Decorative Laminate
22. BAC5596 Type XXIX Next Generation Flexible Decorative Laminate
23. BAC5596 Type XXX Heat Activated Next Generation Flexible Decorative Laminate

This MOC shall be used only for configurations where the test data has significant margin compared to the regulatory requirement as shown below.

Bunsen burner testing:

- 2-inch margin in burn length
- 5 Second margin in extinguish time
- This MOC would not be used for configurations which drip.

Heat release and Smoke:

- 10-point margin for 2-minute total heat release and for peak heat release rate
- 50-point margin for smoke

This MOC applies to color changes (the color and pattern of ink applied or the color of film used to make the decorative laminate) for the same configuration of decorative laminate. It does not apply to changes to the configuration of the decorative laminate other than inherent differences between printed and integrally-colored decorative laminates. The inherent differences between printed and integrally-colored decorative laminates are: A printed decorative laminate typically uses a layer of 1-mil clear polyvinyl fluoride film over the ink for improved durability, but an integrally-colored decorative laminate does not have ink and does not typically use the 1-mil polyvinyl fluoride film "clear cap."

[Regulation] 14 CFR 25.853 (a) and (d) (Appendix F, Parts I, IV, and V)

3.37 Color of Thermoplastics

Thermoplastic materials BMS 8-321 and BMS 8-328 may be shown compliant to 14 CFR 25.853 (a) and (d), (Appendix F, Parts I, IV, and V) by test or by similarity to a part made of a different color.

The FAA concurred with this MOC provided all of the following conditions are met.

1. When substantiating by test, the constructed sample is of a color that will produce the most critical values for the test being performed or is of the color defined on the type design. For example, based on the data provided, BMS8-321 beige-870 exhibits the most critical values in each of the flammability tests when compared to BMS8-321 natural or blue/black-7923 colored samples. Therefore it is acceptable to perform certification tests using BMS8-321 beige-870 samples to substantiate designs specifying BMS8-321 natural, blue/black, or beige. If new colors are qualified to either of these specifications which yield more critical values, this new color must be used when performing certification tests.

2. As defined by 14 CFR Part 21.31, sufficient type design exists to control the flammability properties of the design, to include the color, necessary to demonstrate compliance with the applicable 14 CFR Part 25 airworthiness requirements.

3. For BMS8-321 and BMS8-328 materials, compliance is limited to 14 CFR 25.853 (a) and (d) and 14 CFR Part 25, (Appendix F, Parts I, IV, and V). For all other thermoplastic materials, as limited by item b above, compliance is limited to 14 CFR Part 25.853 (a) and 14 CFR Part 25, (Appendix F, Part I).

4. No material substitutions are acceptable for this method of compliance without further justification and FAA acceptance.

This MOC is expected to be used primarily for BMS8-321 polyetherimide and BMS8-328 polyphenylsulfone. Most other Boeing thermoplastics are covered by the following MOC, Color of Nonmetallic Materials Not Required to Meet Smoke and Heat Release. (See Section 3.38.)

[Regulation] 14 CFR 25.853 (a) and (d) (Appendix F, Parts I, IV and V)

3.38 Color of Nonmetallic Materials Not Required to Meet Smoke and Heat Release

Nonmetallic materials are shown to be compliant with 14 CFRs 25.853 (a) (Appendix F, Part I) by test, or by similarity to a part made from a different color of the same nonmetallic material. This MOC is limited to the following materials which have a material specification or standard drawing that controls the flammability characteristics.

- BMS1-72 Silicone Rubber (BMS1-72 has superseded BMS1-63; the same materials were qualified to both specifications.)
- BMS8-246 Coated Transparent Polycarbonate Sheet
- BMS8-251 Polycarbonate Sheet, Injection Molding, Extrusion, and Rotomolding Resin
- BMS8-270 Polyamide (Nylon) Injection Molding, Rotomolding, and Extrusion Resins
- BMS8-293 Polyetherimide-based Sheet, Injection, Extrusion, and Rotomolding Resins
- BMS8-321 Polyetherimide-based Resin for Injection Molding and Profile Extrusion
- BMS8-328 Polysulfone-based Thermoplastic
- BMS8-400 Polycarbonate-based Resin for Injection Molding and Profile Extrusion

Also, ABCO 2449 and ABCO 2449HT, when controlled by a profile extrusion drawing with 12-second vertical burn requirements.

This MOC is used only for configurations where the test data and specification control requirements have margin compared to the regulatory requirement as shown below.

Vertical burn testing:

- 1-inch margin in burn length
- 5-second margin in extinguish time

This MOC would not be used for configurations which drip.

Note: For BMS 8-321 and BMS 8-328 you may use MOC 3.37 to show compliance to 14CFR 25.853 (a) (Appendix F, Parts I) if all conditions in MOC 3.37 are met.

[Regulation] 14 CFR 25.853 (a) (Appendix F, Parts I)

3.39 [Intentionally Left Blank]

3.40 Hook and Loop Tape on Interior Parts

Interior panels which have hook and/or loop tape applied to the **backside** of the panel are show to be compliant with 14 CFR 25.853 (d), (Appendix F, Parts IV, and V) by:

1) Test of the panel configuration without the hook and/or loop, or

2) The parts attached by the hook and loop tape.

This MOC applies to interior panels where:

1.) Hook and/or loop tape is either less than 9 square inches in area, or

2.) Within 2 inches of the part edge, and the total area of the hook and loop material on a panel does not exceed 1.5 square feet (216 square inches).

The MOC would apply to a panel with hook and/or loop tape at the panel edge and in one or more small (less than 9 square inch) areas away from the part edge, provided the total area does not exceed the stated limit and the small areas are separated by a minimum distance of 6 inches edge to edge.

[Regulation] 14 CFR 25.853 (d) (Appendix F, Parts IV and V)

3.41 [Intentionally Left Blank]

3.42 [Intentionally Left Blank]

3.43 Honeycomb Core Grades (Density)

Panel constructions with BMS8-124 Types I through VI, Class 4 honeycomb core are shown to be compliant with 14 CFR 25.853 (a) (Appendix F, Part I) and 25.855(d) (Appendix F, Part I (a)(1)(ii)) by either test or similarity to panel constructions having the same core Type and Class designation but with a different Grade designation. The table below identifies which core Grades may be used for similarity for flammability data.

Table 4. Data Reuse for Panels with BMS8-124, Types I through VI, Class 4 Core

<table>
<tr>
<td>Data reuse for panels with BMS8-124, Types I though VI, Class 4 core</td>
<td>For flammability testing, the data generated for specific core grades of the same Type and Class can be used for parts fabricated with different grades per the table below.
<table>
<tr><th>BMS8-124 Core Grade</th><th>F1</th></tr>
<tr><td>1.5 data for 3.0 part design</td><td>yes</td></tr>
<tr><td>1.8 data for 3.0 part design</td><td>yes</td></tr>
<tr><td>3.0 data for 1.5 part design</td><td>yes</td></tr>
<tr><td>3.0 data for 1.8 part design</td><td>yes</td></tr>
<tr><td>3.0 data for 8.0 part design</td><td>yes</td></tr>
<tr><td>8.0 data for 3.0 part design</td><td>yes</td></tr>
</table>
</td>
</tr>
</table>

[Regulation] 14 CFR 25.853 (a) (Appendix F, Part I) and 25.855(d) (Appendix F, Part I (a) (1) (ii))

3.44 Surfacing Materials

Surfacing materials are used to fill pinholes, porosity, and minor defects on nonmetallic laminates and sandwich panel constructions. Surface preparation materials and procedures for application to composite parts used inside the pressure vessel are controlled in accordance with process specification BAC5322. Each surfacing material is controlled within the process specification to assure conformance to flammability requirements.

Surfacers, pinhole fillers, and putty materials applied to panels in accordance with BAC5322 do not significantly contribute to the flammability, heat release and smoke emission; therefore, configurations installed within the pressure vessel are shown to be compliant to 14CFR 25.853 (a) and (d) (Appendix F, Part I, IV, and V) by test or by similarity to a panel without the surfacing material applied.

This method of compliance is used for interior components requiring surface preparation prior to additional decorative coatings such as paint or decorative coverings.

[Regulation] 14 CFR 25.853 (a) and (d) (Appendix F, Part I, IV, and V)

[FAA Acceptance] This method of compliance was proposed by BDCO in reference 08-00420 and stamped approved by the OMT.

3.45 Seat Coverings

For Title 14 CFR Part 25, Appendix F parts IV and V applicable to seat special conditions, one major difference distinguishes the rules between FAA and EASA with respect to testing non-traditional, large, non-metallic panels covered with fabrics. FAA Seat Special Conditions (25-358-SC (737), 25-368-SC (747), 25-364-SC (757), 25-369-SC (767), 25-367-SC (777), 25-370-SC (787)) states that non-traditional, large, nonmetallic panels covered with traditional fabrics or leathers will be tested without their coverings or covering attachments. In contrast, EASA (CRI D-GEN02 PTC, CRI D-3, and CRI D-16) states that non-traditional, large, non-metallic panels covered with fabrics which are affixed all over (e.g. glued) will be tested with their covering.

In order to standardize on a test method on programs with joint FAA and EASA oversight, testing of non-traditional, large, non-metallic panels covered with fabrics shall be performed in the following manner: if testing is being performed with "fabrics which are affixed all over (e.g. glued)", then no additional tests will be required to satisfy the FAA special conditions. However, when traditional fabrics and leathers are not affixed all over they will be tested as noted in FAA Special Conditions: 25-358-SC (737), 25-368-SC (747), 25-364-SC (757), 25-369-SC (767), 25-367-SC (777), 25-370-SC (787) and EASA (CRI D-GEN02 PTC, CRI D-3, and CRI D-16).

[Regulation] Seat Special Conditions 25-358-SC (737), 25-368-SC (747), 25-364-SC (757), 25-369-SC (767), 25-367-SC (777), 25-370-SC (787)

4.0 Cargo Liner Oil Burner Methods of Compliance

The Following MoCs are applicable to 14 CFR 25.855 (c), Appendix F Part III:

4.1 Aluminum Temper

Within a given alloy (i.e. 6061, 2024, 7075 etc.), data from any Temper (i.e. T4, T6511, etc.) may be used to satisfy requirements of any other Temper.

[Regulation] 14 CFR 25.855(c), Appendix F Part III

4.2 Aluminum Alloy Substitution

2024, 7050, 7075 alloys are interchangeable for test purposes. Additionally, 6013 and 6061 alloys are interchangeable as well.

[Regulation] 14 CFR 25.855(c), Appendix F Part III

4.3 Aluminum Alloy- Clad vs. No Clad

Bare aluminum alloy may be tested to substantiate the same alloy in clad form.

[Regulation] 14 CFR 25.855(c), Appendix F Part III

4.4 BAC 5564- MOP or Press Cure vs. Vacuum Bag Cure.

This method of compliance is applicable to 25.855 (c) Appendix F Part III:

Press cure and vacuum bag oven cure are equivalent substitutions for substantiating designs incorporating parts fabricated in accordance with BAC 5565 (Process Specification for fabricating parts from BMS 8-226 fiberglass reinforced phenolic resin prepregs.)

[Regulation] 14 CFR 25.855 (c), Appendix F Part III

4.5 Metallic Fasteners Iron Alloys vs. Titanium Alloys

Steel, Stainless Steel, and Titanium fasteners are interchangeable for test and compliance purposes.

[Regulation] 14 CFR 25.855 (c), Appendix F Part III

4.6 Metallic Fasteners -Finish

Cadmium plating with no post treatment vs. cadmium plating with chromate post treatment vs. cadmium plating with chromate post treatment vs. cadmium plating with phosphate post treatment.

Finishes on fasteners made of steel, stainless steel, or titanium are interchangeable with respect to testing and compliance.

[Regulation] 14 CFR 25.855 (c), Appendix F Part III

4.7 Metallic Fasteners Hand Tightening vs. Torquing per Design Requirement

Fasteners may be hand tightened for the test construction instead of torquing per design requirements.

[Regulation] 14 CFR 25.855 (c), Appendix F Part III

4.8 Metallic Fasteners Different Types of Thread Locking

Different types of thread locking, including no thread locking are representative of the design, and are equivalent for any test configuration.

[Regulation] 14 CFR 25.855 (c), Appendix F Part III

4.9 Metallic Fasteners, Screws, Nuts and Washers

Screws and nuts may be used with or without washers interchangeably for steel alloy and titanium alloy fastener systems, provided the washer is part of the engineering design and is a steel or titanium alloy.

[Regulation] 14 CFR 25.855 (c), Appendix F Part III

4.10 Metallic Fasteners Alodine vs. Anodize

For aluminum fasteners, alodine, anodize and bare are equivalent and may be used interchangeably.

[Regulation] 14 CFR 25.855 (c), Appendix F Part III

4.11 Metallic Fasteners Screw Length

Various screw lengths are interchangeable as long as they are long enough and there are no interference issues.

[Regulation] 14 CFR 25.855 (c), Appendix F Part III

4.12 BMS 8-226 Class 3A vs. Class 3B

BMS 8-226 Class 3A and 3B are interchangeable, from a compliance standpoint, in the oil burner test.

[Regulation] 14 CFR 25.855 (c), Appendix F Part III

4.13 Aluminum Vs Nickel Plated Aluminum

Test Parts made of Aluminum may be used to substantiate design made of Nickel plated Aluminum Parts

[Regulation] 14 CFR 25.855(c), Appendix F Part III

4.14 Non-Metallic Placards on Cargo liner

Testing liner panels without placards may be used to satisfy placards adhered to the liner panels by design.

[Regulation] 14 CFR 25.855 (c), Appendix F Part III

4.15 BMS 1-68 Foam Color

Test configurations with any color BMS 1-68 silicone foam may be used to satisfy the requirements of the same design configuration with any other color BMS 1-168 foam.

[Regulation] 14 CFR 25.855 (c), Appendix F Part III

4.16 Integrally Colored BMS 8-98 Tedlar

Test configurations with any color BMS 8-98 tedlar may be used to satisfy the requirements of the same design configuration with any other color BMS 8-98 tedlar. Additionally, any BMS 8-98 tedlar gloss may be tested to substantiate any other BMS 8-98 tedlar gloss.

[Regulation] 14 CFR 25.855 (c), Appendix F Part III

4.17 Paint Color

Test configurations with any color paint (BMS 10-11, BMS 10-83, or BMS 10-60, Type I) may be used to satisfy the requirements of the same design configuration with any other color of the same paint (BMS 10-11, BMS 10-83, or BMS 10-60 Type I).

[Regulation] 14 CFR 25.855 (c), Appendix F Part III

4.18 Intersection of Joints

All joint intersections ("t" and "+" types) will be evaluated for fasteners spacing and edge margins. The fastener spacing will be determined as the peripheral distance between fasteners and not the straight line distance. Data to show compliance will be from test panel configurations replicating the designs along each edge of the panel(s)

[Regulation] 14 CFR 25.855 (c), Appendix F Part III

4.19 Tedlar Gloss

Any BMS 8-98 tedlar gloss may be tested to substantiate any other BMS 8-98 tedlar gloss.

[Regulation] 14 CFR 25.855 (c), Appendix F Part III

4.20 BMS 8-80 Type V Class 1 Grade A vs Type VI Class 1 Grade A

BMS 8-80 Type V Class 1 Grade A and BMS 8-80 type VI class 1 grade A materials may be used interchangeably to satisfy the requirements of the oil burner test.

[Regulation] 14CFR 25.855(c), Appendix F Part III

4.21 BMS 8-80 Class 2 Color

Any color BMS 8-80 Class 2 material is interchangeable for test with any other color BMS 8-80 Class 2 material, provided type and grade are the same.

[Regulation] 14CFR 25.855(c), Appendix F Part III

4.22 No Paint vs Paint

Test results from unpainted configurations may be used to substantiate painted configurations, provided all other aspects of the configurations are the same. This applies only to BMS 10-11, BMS 10-83 and BMS 10-60 paint systems on vertical and corner test configurations and does not apply to horizontal test configurations.

[Regulation] 14 CFR 25.855 (c), Appendix F Part III

4.23 Cargo Liner Overlap Joints

A liner overlap joint test configuration may be used to substantiate a liner overlap joint design configuration when it is the same from a materials standpoint and possesses:

a. Fastener Spacing equal to or greater than the design configuration.

b. Fastener edge margin equal to or less than the design configuration.

c. Panel overlap equal or less than the design configuration.

[Regulation] 14CFR 25.855(c), Appendix F Part III

4.24 Cargo Liner Butt Joints- With Cap Strip

A liner butt joint test configuration may be used to substantiate a liner butt joint design configuration when it is the same from a materials standpoint(including the Cap Strip) and possesses:

a. Fastener Spacing equal to or greater than the design configuration.

b. Fastener edge margin equal to or less than the design configuration.

c. Cap Strip overlap equal or less than the design configuration.

d. Butt Joint gap equal or greater than the design configuration.

[Regulation] 14CFR 25.855(c), Appendix F Part III

4.25 BMS 5-146 Cargo Liner Tape (Adhesively Bonded)

Test configurations with no BMS 5-146 Cargo Liner Tape may be used to substantiate joint designs which include BMS 5-146 Cargo Liner tape as a covering when held in place only by the BMS 5-146 adhesive, provided all other aspects of the configuration are the same.

[Regulation] 14CFR 25.855(c), Appendix F Part III

4.26 BMS 5-146 Cargo Liner Tape (Adhesively Bonded and Mechanically Attached)

Test configurations without adhesive bonded/mechanically attached BMS 5-146 Cargo Liner Tape may be used to substantiate configurations with adhesive bonded/mechanically attached BMS 5-146 Cargo Liner Tape, provided all other aspects of the test configurations are the same. This MOC applies only to vertical and corner test configurations and does not apply to horizontal test configurations.

[Regulation] 14CFR 25.855(c), Appendix F Part III

4.27 BMS 8-80, Type IV vs. BMS 8-80, Types V and VI

Test configurations containing BMS 8-80, Type V or Type VI, may be used to substantiate panel, joint, and/or feature designs which may contain BMS 8-80, Type IV, provided all other aspects of the configurations are the same.

[Regulation] 14CFR 25.855(c), Appendix F Part III

4.28 BMS 1-68, Form II vs. BMS 1-68, Form III

Test configurations containing BMS 1-68, Form III (silicone foam with pressure sensitive acrylic adhesive on one side) may be used to substantiate Cargo Liner designs which include BMS 1-68, Form II (silicone foam without pressure sensitive acrylic adhesive), provided all other aspects of the configurations are the same.

[Regulation] 14CFR 25.855(c), Appendix F Part III

4.29 Alodine vs. Anodize vs. Bare Surface Treatments on Aluminum

For all Aluminum alloys and tempers, Alodine, Anodize, and bare are equivalent and may be used interchangeably, provided all other aspects of the configuration are the same.

[Regulation] 14CFR 25.855(c), Appendix F Part III

4.31 Paint Gloss Level

Test results from configurations with any Paint Gloss Level covered by BMS 10-

11, Type II, BMS 10-60, Type I, and BMS 10-83, Types II, III, or V may be used to substantiate any other gloss level of the same specification, provided that all other aspects of the configurations are the same.

[Regulation] 14CFR 25.855(c), Appendix F Part III

4.32 Paint vs. No Paint

Test results from configurations with BMS 10-11, BMS 10-60, or BMS 10-83 Paint present may be used to substantiate configurations without paint present.

[Regulation] 14CFR 25.855(c), Appendix F Part III

5.0 Insulation/ Radiant Panel Methods of Compliance

Thermal/acoustic insulation that meets the requirements of 14 CFR 25.856 (a) is considered to satisfy the requirements of 25.853 (a) on those airplanes for which the certification basis would otherwise require testing in accordance with 25.853. This determination can be made using the criteria of 25.853, which permits "other approved equivalent methods."

The following methods of compliance are applicable to Title 14 CFR 25.856 (a), Appendix F Part VI.

5.1 Multiple Layers of Batting and Other Encapsulated Materials

Testing one layer of insulation batting is sufficient to certify one or more layers of the same density (grade) and the same or greater thickness (class).

Separate testing of various batting materials with the same cover material is sufficient to certify configurations using combinations of the batting materials with that cover material.

For Example:

Testing one layer of BMS8-48 Type III, Class 1, Grade A batting with BMS8-380 Type III, Class 2 covers

and also testing:

One layer of BMS8-48 Type III, Class 3, Grade L batting with BMS8-380 Type III, Class 2 covers

Can be used to certify a construction consisting of:

One or more layers of BMS8-48 Type III, Class 1, Grade A batting, and

One or more layers of BMS8-48 Type III, Class 3, Grade L batting with BMS8-380 Type III, Class 2 covers.

When a layer of batting of one density is sandwiched between layers of another density, the center layer does not have to be part of the test configuration.

Based on discussion with the FAA on the relatively insignificant effects of density and thickness of batting, blanket configurations with additional layers of batting (including different densities) may be considered similar to a blanket with fewer layers of batting, or with lighter-weight batting which has been tested. If a material (other than fiberglass batting) that has passed radiant panel testing on an exposed surface is sandwiched between layers of batting, the center layer does not have to be part of the test configuration.

[FAA Regulation] 14 CFR 25.856 (a) (Appendix F Part VI)

5.2 Felt on the Surface of a Blanket

Any felt type tested on the surface of a standard blanket (1 layer of insulation) can be used to show compliance of the same felt type on a nonstandard blanket that is compliant when certified without the felt.

Felt only needs to be tested with whatever material is directly adjacent to it in the applicable raw material build-up. The internal core material layers below the immediate outside material adjacent to the felt can be a standard build-up. This is because the internal core material layers must be tested in the basic sample test, so repeating it for felt is not necessary. There is no appreciable difference between testing with a single-batting configuration and a multiple-batting construction, as well as one batting density vs. another.

[FAA Regulation] 14 CFR 25.856 (a) (Appendix F Part VI)

5.3 Insulation Blanket Covering Material

Covering film used by itself. Applications such as this do not require separate radiant panel testing of the film materials.

Insulation covering is sometimes used without the batting or other insulating materials. An example is the tabs which extend beyond an insulation blanket for use in attaching blankets to structure or to other blankets. The materials are tested in blanket configurations and with a variety of auxiliary materials (tape, hook and loop, etc.). This testing is sufficient to certify the uses of covering material by itself.

[FAA Regulation] 25.856 (a) (Appendix F Part VI)

5.4 Tape

Pressure sensitive adhesive tapes will be tested as suggested in AC 25.856-1.

This testing permits arbitrary use of tape in a variety of configurations. Once qualified individually, tapes may be used in combination without further testing, but only on the substrates on which they have been tested.

Since the different types of BMS5-157 Composition MPEEK tape are made from the same materials, testing of the BMS5-157 Type I tape (single backed material with adhesive across the full width) is sufficient to also certify BMS5-157 Types III, and IV. Type III and IV materials are single-backed tapes with adhesive across a portion of the material width.

BMS5-157 Type II Composition MPEEK double-backed tape with adhesive across the full width of both surfaces will be tested in the “as-installed” configuration per type design (between a film blanket cover and an additional layer of the film cover, in conjunction with insulation batting as described in Table 7).

Materials such as cover film or tape which have been shown to meet radiant panel when tested as the test face do not require additional testing when used as edge binding.

[FAA Regulation] 25.856 (a) (Appendix F Part VI)

5.5 Directional Burn Properties (oriented films/warp and fill)

Cover films and coated/uncoated fabrics used as covers will be tested in two directions, labeled warp and fill, in a typical insulation blanket buildup. If the test results do not show an appreciable difference, other buildups using the same cover material will be tested in only one direction.

[FAA Regulation] 25.856 (a) (Appendix F Part VI)

5.6 Quilting Hatch Size

One-inch quilting patterns will be tested to certify more coarse quilting patterns above 1 inch (1.5, 2, 3 inches, etc., and greater).

[FAA Regulation] 14 CFR 25.856 (a) (Appendix F Part VI)

5.7 Tests of Insulation Bonded to Substrates

When insulation is bonded to a substrate that, by itself, would not have to comply with §25.856 (a), such as backs of interior panels, ducts, or skin, it is acceptable to test the insulation bonded to a thin sheet of aluminum (~0.060 inch). It is then acceptable to bond the insulation to a panel or substrate without further certification testing, provided that the substrate by itself doesn't have to meet §25.856.

Source: AC 25.856-1

[Regulation] 25.856 (a) (Appendix F, Parts I and VI)

5.8 Hook and Loop on Insulation

Hook and loop only needs to be tested with specific films, or to whatever it's directly bonded. The core or any substrate below the immediate outside material can be a standard material. This is because the core materials must be tested in the basic sample test, so repeating it for hook and loop is not necessary.

This test of hook and loop may also result in a test of the edge closure of the blanket itself. This is not the intent, but how the edge is closed for the test could have an impact. It should be possible to simply fold the film material over, and staple the remaining three sides to form the sample. This would eliminate the "edge." Hook and loop material which has been tested mated between blankets can then be used to attach to any other substrate which is similar to the tested materials.

Source: AC 25.856-1

[Regulation] 25.856 (a) (Appendix F, Parts I and VI)

5.9 Pressure Sensitive Adhesive Tape on Insulation

Pressure sensitive adhesive tapes will be tested as described in AC 25.856-1. The configuration is shown in Figure 1. This testing permits arbitrary use of tape in a variety of configurations. If the actual tape is wider than 2 inches, it shall be cut down to approximately a 2-inch width. If it is narrower, then the actual width will be tested. Once qualified individually, tapes may be used in combination without further testing, but only with the substrates they have been tested on.

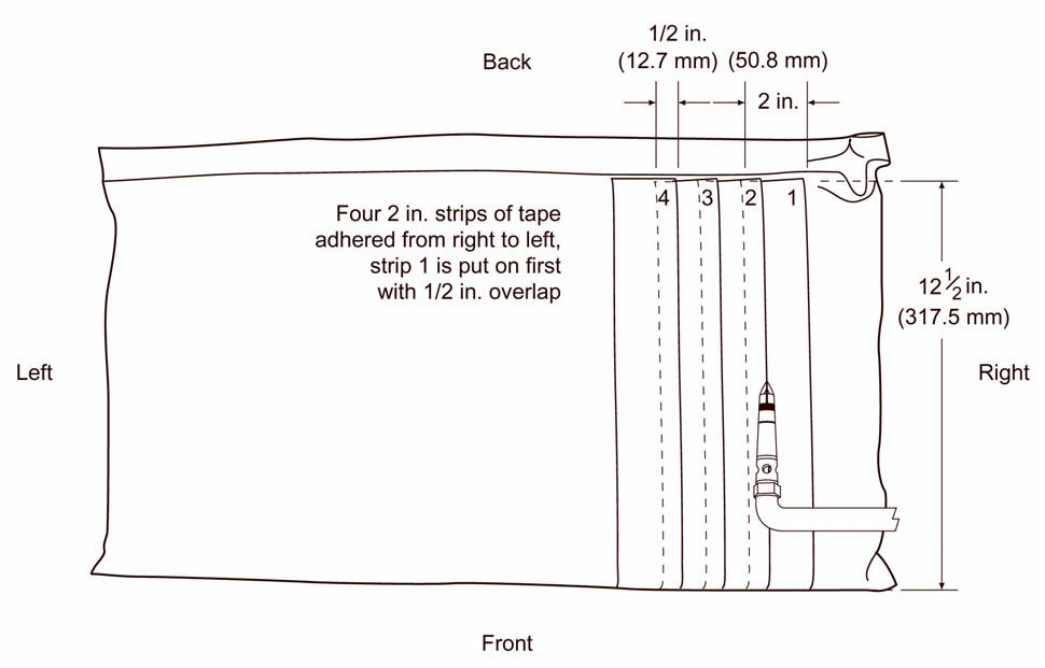

Figure 1. Pressure Sensitive Adhesive Test Sample Construction

[Regulation] 25.856 (a) (Appendix F, Parts I and VI)

5.10 Small Parts on Insulation

Certain items are installed in conjunction with thermal/acoustic insulation, but are not themselves part of the thermal/acoustic insulation. These include:

- Small grommets to permit fastening of wire bundles or other systems
- Clamps
- Small moisture diverters, and
- Small moisture traps on structural components.

Other materials may be bonded to the insulation but, unlike hook and loop and tapes, are not so extensive that they could affect the flame propagation properties of the insulation system. These are materials that are installed at limited locations in the airplane are not contiguous with respect to each other, and are generally only a few square inches in area. Examples of this are:

- Moisture seals on structural penetrations
- Small foam standoffs, and
- Ventilation hole reinforcement grommets.

Additional testing under Part VI of Appendix F using those materials is not needed to demonstrate acceptable flame propagation characteristics.

Source: AC 25.856-1

[Regulation] 25.856 (a) (Appendix F, Parts I and VI)

5.11 Flame Propagation Pass/Fail Criteria

There are three potential ways (one for flame propagation length and two for after flame time) to address sample failures, and establish that the material combination does, in fact, meet the intent of the rule.

If there is a failure of one sample for flame propagation length, additional samples may be tested to substantiate that the failed sample was not representative. Test a minimum of 7 additional samples, none of which can fail. In addition, the average of all the samples, including the failed sample, must be below the pass/fail limits. Depending on the initial test results, it may require more than 10 total samples to bring the average down.

If the material combination fails the after-flame time, it may be due to a random sample construction or test conduct issue, or it may be an artifact of the specific

burner exposure time. This situation can be addressed in one of two ways, depending on the reason for the failure.

1. Test a minimum of 7 additional samples, all of which much satisfy the flame propagation requirements. If the average of all the sample after-flame times is 3 seconds or less, the material combination can be used.

2. Expose the pilot burner for 30 seconds during the test (rather than 15 as prescribed). If the material combination then satisfies both pass/fail criteria, the material combination can be used.

Source: AC 25.856-1

[Regulation] 25.856 (a) (Appendix F, Parts I and VI)

5.12 Insulation with Multiple Cover Materials

When the two sides of the insulation blanket are different from each other, the configuration may be tested from both sides, or configurations similar to each side may be tested. (Material beyond the BMS8-48 batting may differ from the part configuration, by using a different grade of cover material or omitting “extra” materials such as felt, or woven fiberglass).

If BMS8-48 insulation batting materials have been tested in two separate configurations, one with one cover on both sides, and the other with a different cover on both sides, then data from two such tests is sufficient to certify a construction consisting of the batting with dissimilar covers that had been tested in individual configurations. With insulation cover films that encapsulate the BMS8-48 batting, each side of the test sample is tested, and in each case the backside in a given test condition does not have an appreciable effect on the test face interactions of the test sample.

For example, testing one layer of BMS 8-48 Type III, Class 1, Grade A batting with Material A covers and also testing one layer of BMS 8-48 Type III, Class 1, Grade A batting with Material B covers, can be used to certify one layer of BMS 8-48 Type III, Class 1, Grade A batting with a cover of Material A on one side, and a cover of Material B on the other side.

Regulation] 25.856 (a) (Appendix F, Parts I and VI)

Appendix A
Summary of Test Margins

1. Heat Release and Smoke Density Testing

MOC	Title	HR		SD
		2 min total	Peak	
-	FAA requirement per Appendix F	65	65	200
MOC 3.36	Color of Decorative Laminates	55	55	150

2. Bunsen Burner Testing

a. FAA Requirement per Appendix F

	Ignition Time [sec]	Material Position	Extinguish Time	Burn Length	Drip Exting	Burn Rate
F1	60	Vertical	15 sec	6 in.	3 sec	
F2	12	Vertical	15 sec	8 in.	5 sec	
F3	15	Horizontal				2.5 in/min
F4	15	Horizontal				4 in/min

b. MOC 3.33 Interior Panels and 3.36 Color of Decorative Laminates

- 2-inch margin in burn length
- 5 second margin in extinguishing time
- This MOC would not be used for configurations which drip

	Ignition Time [sec]	Material Position	Extinguish Time	Burn Length	Drip Exting	Burn Rate
F1	60	Vertical	10 sec	4 in.	No drip	
F2	12	Vertical	10 sec	6 in.	No drip	
F3	15	Horizontal				2.5 in/min
F4	15	Horizontal				4 in/min

c. MOC 3.35 Adhesives

- This MOC is limited to bonded constructions where results of Bunsen burner tests for both the panel and the unbonded substrate material are 50 percent or less of the regulatory requirement

	Ignition Time [sec]	Material Position	Extinguish Time	Burn Length	Drip Exting	Burn Rate
F1	60	Vertical	7.5 sec	3 in.	1.5 sec	
F2	12	Vertical	7.5 sec	4 in.	2.5 sec	
F3	15	Horizontal				1.25 in/min
F4	15	Horizontal				2 in/min

d. MOC 3.38 Color Nonmetallic Materials Not Required to Meet Smoke & HR

- 1-inch margin in burn length
- 5 second margin in extinguishing time
- This MOC would not be used for configurations which drip

	Ignition Time [sec]	Material Position	Extinguish Time	Burn Length	Drip Exting	Burn Rate
F1	60	Vertical	10 sec	5 in.	No drip	
F2	12	Vertical	10 sec	7 in.	No drip	
F3	15	Horizontal				2.5 in/min
F4	15	Horizontal				4 in/min

Active Page Record

Page Numbers	Revision Level	Revision Type (Added, Deleted)	Page Numbers	Revision Level	Revision Type (Added, Deleted)
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1 to 39	Rev D				
A1 to A3	Rev D				
APR-1	Rev D				
Rev Record 1 to Rev Record 5	Rev D				

Revision Record

Revision Letter **A**

Changes in This Revision

The following changes were made to Rev A:

3.10 Thickness Ranges
- Fixed chart to incorporate missing thickness ranges

3.32 Rubstrips/Chafing Strips
- Fixed typo on applicable regulation.

3.35- Adhesive- Small Area Bonding-
- Updated Table 3

3.37 Color of Thermoplastics
- Added note regarding applicable materials

3.40 Hook and Loop Tape on Interior Parts
- Formatted MOC

3.41 Flame Propagation to Show Compliance with 25.853 (a)
- Removed MOC

3.45 Seat Coverings
- Fixed format of applicable regulations

-All references to FAA letters were deleted from the document.

-The following Methods of compliance were added:

3.43 Honeycomb Core Grades (Density)
- Cargo Liner Oil Burner Methods of Compliance:

4.1 Aluminum Temper
4.2 Aluminum Alloy Substitution
4.3 Aluminum Alloy- Clad vs. No Clad
4.4 BAC 5564- MOP or Press Cure vs. Vacuum Bag Cure
4.5 Metallic Fasteners Iron Alloys vs. Titanium Alloys
4.6 Metallic Fasteners -Finish
4.7 Metallic Fasteners Hand Tightening vs. Torquing per design requirement
4.8 Metallic Fasteners Different types of thread locking
4.9 Metallic Fasteners Screws, nuts and washers
4.10 Metallic Fasteners Alodine vs. Anodize
4.11 Metallic Fasteners Screw Length
4.12 BMS 8-226 Class 3A vs. Class 3B
4.13 Aluminum Vs Nickel Plated Aluminum
4.14 Non-Metallic Placards on Cargo liner
4.15 BMS 1-68 Foam Color
4.16 Integrally Colored BMS 8-98 Tedlar
4.17 Paint Color
4.18 Intersection of Joints
4.19 Tedlar Gloss
4.20 BMS 8-80 Type V Class 1 Grade A vs Type VI Class 1 Grade A
4.21 BMS 8-80 Class 2 Color
4.22 Paint vs No Paint-
4.23 Cargo Liner Overlap Joints

4.24 Cargo Liner Butt Joints- With Cap Strip
4.25 BMS 5-146 Cargo Liner Tape (Adhesively Bonded)
4.26 BMS 5-146 Cargo Liner Tape (Adhesively Bonded and Mechanically Attached)
4.27 BMS 8-80, Type IV vs. BMS 8-80, Types V and VI
4.28 BMS 1-68, Form II vs. BMS 1-68, Form III
4.29 Alodine vs. Anodize vs. Bare Surface Treatments on Aluminum
4.31 Paint Gloss Level
4.32 Paint vs. No Paint

Insulation-Radiant Panel Methods of Compliance:

5.1 Multiple Layers of Batting and Other Encapsulated Materials
5.2 Felt on the Surface of a Blanket
5.3 Insulation Blanket Covering Material
5.4 Tape
5.5 Directional Burn Properties (oriented films/warp and fill)
5.6 Quilting Hatch Size
5.7 Tests of Insulation Bonded to Substrates
5.8 Hook and Loop On Insulation
5.9 Pressure Sensitive Adhesive Tape on Insulation
5.10 Small Parts on Insulation
5.11 Flame Propagation Pass/Fail Criteria

Signatures

AUTHOR:	Ricardo Andrade Aguilar, BCA Flammability SAW	66-CB-7008	04-12-2012
	(signature on file)	Org. Number	Date
APPROVAL:	Susan Glicksberg, BCA Flammability SAW Manager	66-CB-7008	04-12-2012
	(signature on file)	Org. Number	Date
APPROVAL:	Kendall Krieg, BCA Flammability Manager	66-CB-7003	03-30-2012
	(signature on file)	Org. Number	Date
CONCURRENCE:	James Kwong for Christine Thompson, RA Concurrence	66-CB-T320	4-12-2012
	(signature on file)	Org. Number	Date
DOCUMENT RELEASE:	Charlene J. Gerken	9M-ST-EUB0	4-15-2012
		Org. Number	Date

Revision Letter **B**

Changes in This Revision

The following changes were made to Rev B:

Incorporated ADRN 1A

- Added BMS 8-321 and BMS 8-328 to the materials list in MOC 3.38 and clarify note at the end of the MOC.

Section 3.0

- Updated Section title: “Bunsen Burner, Heat Release and Smoke Methods of Compliance:

MOC 3.1 Small Parts

- Remove applicability of Seat Special Conditions from the first paragraph (error from rev D D6-83466)

MOC 3.19 Fully Enclosed Box

- Added definition of a fully enclosed box

MOC 3.44 Surfacing Materials

- Added applicability to 25.853 (d) in the “FAA Regulation” section (was missed in rev A)

Signatures

AUTHOR:	Ricardo Andrade Aguilar, BCA Flammability SAW	66-CB-7008	02-7-2013
	(signature on file)	Org. Number	Date
APPROVAL:	Susan Glicksberg, BCA Flammability SAW Manager	66-CB-7008	02-04-2013
	(signature on file)	Org. Number	Date
APPROVAL:	Kendall Krieg, BCA Flammability Manager	66-CB-7003	02-01-2013
	(signature on file)	Org. Number	Date
CONCURRENCE:	Ken Young, AR Advisor	66-CB-7008	02-04-2013
	(signature on file)	Org. Number	Date
DOCUMENT RELEASE:	Charlene J. Gerken	9M-ST-EUB0	2-14-2013
		Org. Number	Date

Revision Letter **C**

Changes in This Revision

1. Section 1.3 added definition for abbreviations “HR” and “SD.”
2. Incorporation of ADRN No. 2B: section 2.1 Applicability of Methods of Compliance to FAA Regulations, page 6. MOC 3.36 is applicable to 25.853 (a). An “X” has been added to the appropriate cell.
3. Corrected typographical error in MOC 3.4. Changed “12 CFR 25.853 (a)” to “14 CFR 25.853 (a).”
4. Incorporation of ADRN No. 2B: wording was added to MOC 3.7 on page 12 to document that this MOC is not to be used after November 8, 2013.
5. Incorporation of ADRN No. 1B: added content to MOC 3.8 “Equivalent Weaves.”
6. Added applicability note below the table in MOC 3.10.
7. Corrected a typographical error in the last paragraph of MOC 3.32. Was “with.” Is “without”
8. Added note to MOC 3.34 to document that this MOC is not to be used going forward.
9. Incorporation of ADRN No. 2B: a typo was corrected on page 27 by adding 14 CFR 25.853 (a) and Appendix F, Part I to the regulations listed for MOC 3.36 Color of Decorative Laminates. 14 CFR 25.853 (a) is included in the MOC description but was mistakenly left out in the list of regulations affected.
10. Corrected typo on the regulation line for MOC 3.37. Added 25.853(d) and Parts IV and V of appendix F.
11. Incorporation of ADRN No. 3B and 4B: added Appendix A which provides a summary section of all the test margins.

Signatures

AUTHOR:	Yusuf Mansour, BCA Flammability	66-CB-7008	3/16/2015
	(signature on file)	Org. Number	Date
APPROVAL:	Patricia K Holt, BCA Flammability SAW Manager	66-CB-7008	1/27/2015
	(signature on file)	Org. Number	Date

APPROVAL:	Wayne Mortensen, BCA Flammability Senior Manager	66-CB-7005	2/6/2015
	(signature on file)	Org. Number	Date
CONCURRENCE:	Ken Young, AR Advisor	66-CB-7008	10/14/2014
	(signature on file)	Org. Number	Date
DOCUMENT RELEASE:	Charlene J. Gerken	9M-ST-EUB0	March 18, 2015
		Org. Number	Date

Revision Letter **D**

Changes in This Revision

1. Added ECCN number to all pages.
2. Revised section 3.1 Small Parts per FAA letter.

Signatures

AUTHOR:	Monal Shah, BCA Flammability SAW Manager	66-CB-7008	11/30/2017
	(signature on file) BEMSID 1883200	Org. Number	Date
APPROVAL:	Monal Shah, BCA Flammability SAW Manager	66-CB-7008	11/30/2017
	(signature on file) BEMSID 1883200	Org. Number	Date
APPROVAL:	Barry Colwell, BCA Flammability Senior Manager	66-CB-7005	12/1/2017
	(signature on file) BEMSID 28281	Org. Number	Date
CONCURRENCE:	Ken Young, AR Advisor	66-CB-7008	12/1/2017
	(signature on file) BEMSID 260953	Org. Number	Date
DOCUMENT RELEASE:	John K. Wittemann 299975	9M-ST-EUA0	December 6, 2017
		Org. Number	Date