

Equivalent Safety Finding**Use of Reduced Vertical Bunsen Burner
Flammability Requirements for Interior
Materials**Doc. No.: **ESF-D25.853-01**

Issue : 1

Date : 16 Jan 2020

Proposed ☒ Final ☐

Deadline for comments: 06 Feb 2020

SUBJECT : **Use of Reduced Vertical Bunsen Burner Flammability Requirements for Interior Materials**

REQUIREMENTS incl. Amdt. : **CS.25.853(a) Amdt 14, CS.25.855(d) Amdt 14**

ASSOCIATED IM/AMC¹ : Yes ☐ / No ☒

ADVISORY MATERIAL :

INTRODUCTORY NOTE:

The following Equivalent Safety Finding (ESF) has been classified as important and as such shall be subject to public consultation in accordance with EASA Management Board decision 12/2007 dated 11 September 2007, Article 3 (2.) which states:

"2. Deviations from the applicable airworthiness codes, environmental protection certification specifications and/or acceptable means of compliance with Part 21, as well as important special conditions and equivalent safety findings, shall be submitted to the panel of experts and be subject to a public consultation of at least 3 weeks, except if they have been previously agreed and published in the Official Publication of the Agency. The final decision shall be published in the Official Publication of the Agency."


IDENTIFICATION OF ISSUE:

An applicant cannot literally comply with CS 25.853(a) and proposed the use of reduced vertical Bunsen burner requirements on certain edge-filled aluminium honeycomb sandwich panels used in the interior of an aircraft.

The aircraft subject to this ESF includes some installations which use a specific edge-fill material applied on a specific aluminium honeycomb sandwich panel, and which have been shown not to pass the 12-second vertical Bunsen burner flammability test outlined in CS 25, Appendix F, Part I, paragraph (a)(1)(ii) and paragraph (b)(4). During testing of ten (10) specimens, all passed the burn-length requirement of the edge-fill. [Note: For certification, all large interior panels are tested separately, without edge-fill or other edge protection, as cut-sections to the 60-second vertical test prescribed by Appendix F to CS 25, Part I, paragraph (a)(1)(i) and paragraph (b)(4).].

The proposal reflects a specific recommendation from a Working Group reporting to the Aviation Rulemaking Advisory Committee (ARAC) Transport Airplane and Engine (TAE) Subcommittee. Per the ARAC tasking, a Materials Flammability Working Group has made recommendations to the ARAC through the TAE Subcommittee regarding the FAA's approach to update, reorganise and improve the level of safety requirements for the flammability of materials for transport category airplanes. Among these recommendations was a proposal that "Vertical Bunsen burner tests should only measure burn length (but still require that materials self-extinguish, including drips/puddles)."

¹ In case of SC, the associated Interpretative Material and/or Acceptable Means of Compliance may be published for awareness only and they are not subject to public consultation.

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Considering all the above, the following compensating factors providing an Equivalent level of Safety are proposed:

Equivalent Safety Finding to CS 25.853(a) Amdt 14 and CS 25.855(d) Amdt 14

Use of Reduced Vertical Bunsen Burner Flammability Requirements for Interior Materials

Elimination of the after flame time requirement of the vertical Bunsen burner test, coupled with the testing criteria and design features provided below as compensating factors, will provide an equivalent level of safety compared to full compliance with CS.25.853(a) at Amendment 14 and CS.25.855(d) at Amendment 14:

1. When using the test method provided in Appendix F, Part I, paragraph (a)(1)(ii), the results of the 12-second Vertical Bunsen Burner (VBB) tests of the edge-filled panel shows that the tested specimens are self-extinguishing (not later than 30 seconds after removal of the flame), that there are minimal to no measurable burn length, and that no flaming drips are observed;
2. The result of testing to DOT/FAA TC-12/10, Appendix Z, Item 33, Edge Potting tests [Ref 1], "Foam Block" test, simulating an intermediate scale fire and testing edge-filled panel configurations (edge face-down/horizontally, and edge face-out/vertically, and edge face-out at a 65-degree angle) with the panels edges exposed to the foam block fire threat, shows acceptable pass/fail results for the self-extinguishing time (not to exceed 30 seconds) and the burn length (no propagation beyond 2-inches from the area of direct flame impingement from the fire source);
3. The results of testing of the edge-filled panel edge in the as-installed orientation using a Vertical Bunsen Burner applied for 60 seconds show that the specimens are self-extinguishing (0.0 seconds), that the burn-width is less than 1-inch wide post-ignition (no horizontal propagation), and that there is no flaming drips; and

EASA has accepted the FAA PS-ANM-25.853-01-R02 as method of compliance. Also EASA is participating to the bilateral rulemaking activities regarding an updated Appendix F and consequently CS/FAR 25.853 requirement.

The following FAA report DOT/FAA/TC12/10 Appendices are used as background to this ESF to support using the Foam Block test:


APPENDIX Z—ITEM 33: EDGE POTTING AND/OR EDGE FOAM

APPENDIX AA—ITEM 42: BONDED INSERTS

APPENDIX BB—ITEMS 43a-f: BONDED JOINTS

In PS-ANM-25.853-01-R02, Reference No. 24, Bonded Joints, Option #4, the combination of Foam Block test and the reduced Vertical Bunsen Burner requirement (ie- burn length and drip extinguishing time only) is an acceptable means of compliance for panel adhesive bonded joints.



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Although PS-ANM-25.853-01-R02, Reference No. 23, Edge potting, does not provide this option, the Appendix Z referenced in the policy statement, and above, does contain the same Foam Block test method as part of the overall test program.

EASA considers the Foam Block test is also an acceptable means of compliance for Edge-filled panels is based on comparison of the “outside” bonded panel joint to the subject edge-filled panels. Both of the configurations have bare materials (ie- adhesive, and edge-fill, respectively) directly exposed to the Foam Block fire threat.

