COMMENT RESPONSE DOCUMENT (CRD) TO NOTICE OF PROPOSED AMENDMENT (NPA) 2008-13

for amending the Executive Director Decision No. 2003/02/RM of 17 October 2003 on certification specifications, including airworthiness codes and acceptable means of compliance, for large aeroplanes (« CS-25 »)

"Thermal/Acoustic Insulation Material"

Explanatory Note

I. General

1. The purpose of the Notice of Proposed Amendment (NPA) 2008-13, dated 20 May 2008 was to propose an amendment to Decision N° 2003/02/RM of the Executive Director of the European Aviation Safety Agency of 17 October 2003 on certification specifications, including airworthiness codes and acceptable means of compliance, for large aeroplanes (CS-25) as amended by Executive Director's Decision N° 2007/020/R of 20 December 2007 (CS 25 Amendment 4)[1].

II. Consultation

2. The draft Executive Director's Decision amending Decision N° 2003/02/RM was published on the web site (http://www.easa.europa.eu) on 21 May 2008.

   By the closing date of 21 August 2008, the European Aviation Safety Agency ("the Agency") had received 45 comments from 9 National Aviation Authorities, professional organisations and private companies.

III. Publication of the CRD

3. All comments received have been acknowledged and incorporated into this Comment Response Document (CRD) with the responses of the Agency.

4. In responding to comments, a standard terminology has been applied to attest the Agency's acceptance of the comment. This terminology is as follows:

   - **Accepted** – The comment is agreed by the Agency and any proposed amendment is wholly transferred to the revised text.
   - **Partially Accepted** – Either the comment is only agreed in part by the Agency, or the comment is agreed by the Agency but any proposed amendment is partially transferred to the revised text.
   - **Noted** – The comment is acknowledged by the Agency but no change to the existing text is considered necessary.
   - **Not Accepted** - The comment or proposed amendment is not shared by the Agency

   The resulting text highlights the changes as compared to the current rule.

5. The Agency's Decision will be issued at least two months after the publication of this CRD to allow for any possible reactions of stakeholders regarding possible misunderstandings of the comments received and answers provided.

6. Such reactions should be received by the Agency not later than 10 January 2009 and should be submitted using the Comment-Response Tool at http://hub.easa.europa.eu/crt.

[1] Note that in the meantime CS-25 was last amended by Executive Director's Decision N° 2008/006/R of 29 August 2008 (CS-25 Amendment 5)

IV. CRD table of comments, responses and resulting text

(General Comments)	-

comment	*6* comment by: *Luftfahrt-Bundesamt* The LBA accepts and supports the contents of the NPA.
response	*Noted*

comment	*7* comment by: *Austro Control GmbH* Austro Control is generally supporting this NPA. However due to the safety impact, retroactive measures for this subject should be added to the rulemaking programme as envisaged by JAA NPA 26-17.
response	*Noted* Revision of JAR-26 was not part of this NPA. For your information, ongoing JAR-26 rulemaking tasks will be taken over by the Agency (see Paragraph A.V.5.c. of the NPA).

comment	*10* comment by: *FAA* The FAA fully supports the NPA, and notes the editorial correction to the cross-reference in Appendix F, part VII, paragraph (f)(1). The FAA has no further comments.
response	*Noted*

comment	*39* comment by: *AIRBUS* Airbus considers very important to make a clear reference to the final AC 25.856-2A, as this AC contains the results of the researches made by the FAA TC together with the different test laboratories on alternative test apparatus, as well as on the test requirements. The results of these extensive researches are not reflected in FAA final rule but are part of the revised AC 25.856-2A. Therefore, Airbus invites EASA to get experience of the tremendous and extensive work performed by the FAA and the FAA TC, that have been necessary to fix the problems encountered by the Industry/test labs to meet the requirements of the rule. Even if the FAA did not update the rule, there has been a number of guidance and technical evolutions that should be considered by EASA to help writing a workable rule. It is understood that EASA voluntarily harmonized the proposed rule with the FAA, which is very well appreciated, but EASA shall be aware that complying with the rule, as it is written today, is only possible with the help of the latest guidance material provided by the FAA. Therefore, all the appropriate guidance materials shall be referenced to make the compliance with the rule technically achievable. Consequently, the AMC 25.856(b) should refer to the FAA AC25.856-2A, issued on July 29, 2008.
response	*Accepted*

Concerning the Appendix F (Part VII in this comment but it is applicable for Part VI as well), the Agency adopts the same position as FAA: the rule itself will not be updated so that FAR-25 Appendix F will have the same content as EASA CS-25 Appendix F. The Agency believes it is in the interest of the Industry not to deviate from the FAA rule. In addition, CS-25 refers to "Appendix F to CS-25 or other approved equivalent test requirement" which gives the possibility for the Agency to consider any other test proposal.

Concerning the guidance material, the Agency agrees with your comment :
Due to the fact that FAA AC 25.856-2 was replaced by AC 25-856-2A, EASA AMC 25.856 (b) will be updated to refer to AC 25.856-2A instead of AC 25.856-2 in order to take into account the latest guidance material.

See resulting text for AMC 25.856 (b)

Then, AMC 25.856 (b) will give needed additional methods and procedures coming from experience as well as extensive research to complete the Appendix F. The final rule, including AC will finally reflect the latest state of the art and can be considered as directly acceptable by the Agency.

comment

44 comment by: *Royal Danish Aeroclub*

This NPA 2008-13 is regulating Large Aeroplanes (more than 5700 kg MTOW) and do not have any affect upon our members activities and interests.

Royal Danish Aeroclud does not have any comments to this proposal.

response

Noted

resulting text

Book 2
AMC - SUBPART D
....
AMC 25.856(b)
Thermal/acoustic insulation materials: Flame penetration (Burnthrough) resistance
FAA Advisory Circular 25.856-2A Installation of Thermal/Acoustic Insulation for Burnthrough Protection, dated 29/07/2008, is accepted by the Agency as providing acceptable means of compliance with CS 25.856(b) and Part VII of Appendix F to CS-25.

TITLE PAGE p. 1

comment

9 comment by: *DGAC France*

The French DGAC has no comment on this NPA 2008-13

response

Noted

A. Explanatory Note - IV. Content of the draft decision p. 4-8

comment	*11* comment by: ***AIRBUS***
	Paragraph 9: It is Airbus understanding that the wording "the same test criteria" means "applicable test criteria prescribed in Part I of Appendix F".
response	*Noted*
	This is indeed the meaning.

comment	*12* comment by: ***AIRBUS***
	Paragraph 17: Airbus emphasizes that for the purpose of the rule, "small tapes" and "labeling" are also considered small parts. Note: Similar comment has been made to FAA NPRM - Airbus comments sent to FAA the 12 January 2001.
response	*Noted*
	Small tapes and labelling are considered small parts which are excluded from the applicability of the rule.

comment	*40* comment by: ***AIRBUS***
	Paragraph 14: AC25.856-1: The content of this AC is not limited to the thermal/acoustic insulation materials, but it also provides guidance on material combinations and designs. This should have been clearly mentioned. AC 25.856-2: Airbus considers very important to make a clear reference to the final AC 25.856-2A, as this AC contains the results of the researches made by the FAA TC together with the different test laboratories on alternative test apparatus, as well as the test requirements. The AMC should make a cross-reference to the corresponding final AC. In addition, the FAA made an extensive work together with the affected industries and concluded that certain area of the airplane shall not be modified, as the installation of modified flame penetration resistant materials in those identified area would not contribute to delay the entry of a fire into the aircraft. The results of this cooperative work are mentioned in the final AC.
response	*Partially accepted*
	AC 25.856-1: The comment is agreed: the scope of this AC is not limited to thermal/acoustic insulation materials but covers also the material combinations and designs. Paragraph 14 of the explanatory note only introduces the AC 25.856-1 and was not meant to give details on applicability. Detailed scope is given in the AC itself. AC 25.856-2A: See response to comment nr. 39.

comment	*41* comment by: ***AIRBUS***
	Paragraph 16:

The paragraph 16 reads:
"[...] The Agency therefore decided to postpone the task until these problems were resolved and the testing method and equipment, as prescribed in the FAA Final Rule, confirmed. [...]"

The test method and apparatus mandated by the rule - FAA Appendix F Part VII - flame penetration - are not fully in line with the test apparatus and methodology that are used by the test laboratories. The FAA TC made an extensive work together with the laboratories to determine accurate parameters as well as alternative test apparatus. The results of these extensive researches are not reflected in FAA final rule but are part of the revised AC 25.856-2A. Therefore, Airbus invites EASA to get experience of the tremendous and extensive work performed by the FAA and the FAA TC, that have been necessary to fix the problems encountered by the Industry/test labs to meet the rule. Even if the FAA did not update the rule, there have been number of guidance and technical evolutions that should be considered by EASA to help writing a rule that can be fulfilled. It is understood that EASA voluntarily harmonized the proposed rule with the FAA, which is very well appreciated, but EASA shall be aware that complying with the rule, as it is written today, is only possible with the help of the latest guidance material provided by the FAA. Therefore, all the accurate and final guidance materials shall be referenced to make the compliance with the rule technically achievable.

As a general comment - already made to the FAA Docket 2000-7909 in 2001 - the requirement shall be "objective oriented" rather than "design oriented".

response *Partially accepted*

As per CS 25-856 (b), thermal/acoustic insulation material must be tested in accordance with Part VII of Appendix F or any equivalent test requirement. On top of this Part VII, and as written in response to comment nr. 39, AMC 25.856 (b) will refer to the latest AC 25.856-2A which gives additional methods and procedures coming from experience as well as extensive research.

The new CS 25.856 is a mix of "objective oriented" and "design oriented" requirement.
The objective is clearly given with a high standard for material resistance to flame propagation and flame penetration.
The design is suggested concerning the insulation material to be used as per tests requirements.

comment *42* comment by: *AIRBUS*

Paragraph 23:
The paragraph 23 reads:
"[...] Such blankets are attached to the fuselage skin and/or elsewhere e.g. to the **floor panels**. [...]"
EASA should have better explained the intent of the rule:
§ 25.856(b) applies to thermal/acoustic insulations that are installed near the outer skin of the lower half of the airplane fuselage. The intent of the rule is to provide a barrier that will delay entry of a post crash fire into the occupied areas of the airplane. Therefore, if an airplane were to incorporate insulation not on the fuselage skin, but along the underside of the floor, this insulation would be subject to the flame penetration test of § 25.856(b). If insulation were installed in both places, only one of the installations would be subject to

the flame penetration test.

The paragraph 23 reads:
"[...] Insulation on ducts e.g. is not considered to significantly contribute to burnthrough and therefore does not have to comply. [...]"
The intent of the flame penetration rule is to delay the entry of a post crash fire into the aircraft. So, §25.856(b) applies to the thermal/acoustic insulation installed in the lower half of the fuselage that contributes to delaying burnthrough. Insulation on ducts in the lower half of the fuselage does not have to comply - this is one-example of thermal/acoustic insulation installations that the Agency finds would not contribute to improve the fire penetration resistance.
But there are others examples given in the FAA AC 25.856-2A which modification according to 25.856(b) would not contribute to the overall flame penetration resistance of the aircraft:

- Lower lobe cargo doors leading to class C compartment and having a complete liner that meets Appendix F Part III,
- The passenger doors when the insulation materials below the split line does not exceed 12 inches high and
- The wing box itself.

Note: AC25.856-2A also provides examples of areas that could be alleviated, in coordination with the FAA (like the small piece of insulation materials installed between windows below the split line, or certain small pieces of insulation in the cockpit).

response

Noted

Paragraph 12 and Paragraph 25 specifically explain the burnthrough concept and the intent of the rule: "post crash external fire scenario"; "typically affect thermal acoustic insulation installed near the outer skin of the lower half of the fuselage"

All the possible scenarios and details can not be covered in the NPA or in the rule itself. Anyhow, any new installation will be considered by the Agency on a case by case basis.

Paragraph 23 gives examples of insulation material not considered to significantly contribute to burnthrough. So those materials do not need to comply with CS 25.856 (b). This example is not considered as the only one and AC 25.856-2A is referred to as an AMC accepted by the Agency.

See response to comment nr. 39 concerning the reference to AC 25.856-2A instead of AC 25.856-2.

comment

43 comment by: *AIRBUS*

Paragraph 28:
The paragraph 28 reads:
"[...] FAA AC 25.856-2 "Installation of Thermal/Acoustic Insulation for Burnthrough Protection" dated 17 January 2006 is proposed for acceptance by the Agency as an Acceptable Means of Compliance (AMC) with CS 25.856(b). [...]"
The first release of FAA AC25.856-2 does provide guidance neither on alternate test apparatus (NexGen burner, which is an improved version of the burner

specified in the rule) nor on the other acceptable test requirements (pass/fail criteria). The test method and apparatus mandated by the rule - FAR 25 Appendix F Part VII - flame penetration - are not fully in line with the test apparatus and methodology that are used by the test laboratory. The FAA TC made an extensive work together with the laboratories to determine accurate parameters as well as alternative test apparatus. The results of these extensive researches are not reflected in FAA final rule but are part of the AC 25.856-2A. Therefore, Airbus invites EASA to get experience of the tremendous and extensive work performed by the FAA and the FAA TC, that have been necessary to fix the problems encountered by the Industry/test labs to meet the rule. Even if the FAA did not update the rule, there have been number of guidance and technical evolutions that should be considered by EASA to help writing a rule that can be fulfilled. It is understood that EASA voluntarily harmonizes the rule with the FAA, which is very well appreciated, but EASA shall be aware that complying with the rule, as it is written today, is only possible with the help of the latest guidance material provided by the FAA. Therefore, all the accurate guidance materials shall be referenced to make the compliance with the rule technically achievable.

response *Accepted*

See response to comment nr. 39. All the references to AC 25.856-2 will be replaced by AC 25.856-2A.

A. Explanatory Note - V. Regulatory Impact Assessment - 1. Purpose and Intended Effect p. 8-9

comment *13* comment by: *AIRBUS*

Paragraphs 26 & 27:
The term "flame barrier" should be preferred to the term "flame arrestor" since it is the wording generally used in the FAA documentation.
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Paragraph 27:
The meaning of the sentence "With regard to the intent of the heat flux measurement, it is included in the rule to prevent "flame arrestors" from being qualified as meeting the burnthrough requirement" is not clear.

response *Noted*

"Flame barrier" has the same meaning as "flame arrestor".

The Agency agrees that the sentence is difficult to read. It reflects the following meaning: The flame arrestor on its own can not be considered as a means of compliance with the burnthrough requirement.

comment *14* comment by: *AIRBUS*

Paragraph 29:
Airbus emphasizes that although the rule will apply to thermal/acoustic insulation that are installed, the rule does not require adding thermal/acoustic insulation in areas that are not insulated.

response *Noted*

The proposed rule does not require additional insulation material, only

compliance with described test requirements for the ones installed.

A. Explanatory Note - V. Regulatory Impact Assessment - 2. Options p. 9-10

comment *15* comment by: *AIRBUS*

Paragraph 5.1.c:
Since the applicability of the latest requirements to a design change is driven by the Annex Part 21, the reference of the applicability of the new requirements to "significantly changed type designs" is useless and confusing. The new flammability standards are not applicable to every significant change. The applicability of the new flammability standards results from the analysis described in the paragraph 21A.101 of the Part 21 and this applicability is not systematic. The reference to "significantly changed type designs" should not have been mentioned.

response *Accepted*

The new CS-25 provision will be applicable to changes in type design according to 21A.101 of Part-21. It does not systematically apply to all significant changes.

Note: The comment is agreed in principle but the explanatory note will not be published again.

comment *16* comment by: *AIRBUS*

Paragraph V.2.a:
Since the applicability of the latest requirements to a design change is driven by the Annex Part 21, the reference of the applicability of the new requirements to "significantly changed type designs" is useless and confusing. The new flammability standards are not applicable to every significant change. The applicability of the new flammability standards results from the analysis described in the paragraph 21A.101 of the Part 21 and this applicability is not systematic. The reference to "significantly changed type designs" should not have been mentioned.

response *Accepted*

See response to comment nr. 15.

comment *17* comment by: *AIRBUS*

Paragraph V.4.a.i:
Since the applicability of the latest requirements to a design change is driven by the Annex Part 21, the reference of the applicability of the new requirements to "significantly changed type designs" is useless and confusing. The new flammability standards are not applicable to every significant change. The applicability of the new flammability standards results from the analysis described in the paragraph 21A.101 of the Part 21 and this applicability is not systematic. The reference to "significantly changed type designs" should not have been mentioned.

response *Accepted*

See response to comment nr. 15.

comment 18 comment by: AIRBUS

Paragraph V.4.a.i:
The fire threat addressed by the two improved flammability standards proposed by the rule should have been better specified:
On one hand, the flame propagation addresses in-flight fire threat, especially when the fire could occur in non- accessible area. For this part of the requirement, all thermal/acoustic insulation materials are affected.
On the other hand, the flame penetration addressed pool fire threat (post-crash condition - on ground). This part of the requirement concerns the thermal/acoustic insulation installed nearest to the fuselage only in the lower half.
Furthermore, Airbus asks EASA to clarify if the meaning of "post-crash fire" is the same as the one used by the FAA (i.e. if the aircraft is considered in the same conditions).

response *Noted*

The whole NPA explains the two concepts: flame propagation and flame penetration. Paragraph V.4.a.i sums-up the options already described in previous Chapters (see e.g. V.1.a.).

The post-crash fire wording used by EASA has the same meaning as the one used by the FAA.

comment 45 comment by: UK CAA

Paragraph: 2
Comment:
The rule comes in two parts, flame propagation (flammability) and flame penetration (burnthrough). The thermal-acoustic insulation and its installation, in any one aircraft, has all to meet the former but not all the latter, for example in the top half of the fuselage. Furthermore the safety benefit analyses of potential lives saved are quite separate for propagation and penetration. Therefore, it would have been quite possible, although not harmonised with the FAA, to consider an option of including one part of the rule, (flammability), and not the other (penetration). UK CAA is not proposing that this would have been the optimum action but it should have been considered as an option. Industry may well have expected it to have been considered at least as seriously as 'do nothing'.
Justification:
The suggested action in the comment is considered at least as practical and technically valid as the 'do nothing' option included in the NPA.
Proposed Text:
An additional option should be included in Paragraph 2 as described above. (Detailed wording not provided here).

response *Partially accepted*

The Agency acknowledges that the option as described by the comment provider is a theoretical option that could have been included in the RIA.

As described in the RIA (Paragraph V.1.c), the 1st objective of the NPA was to improve flame propagation resistance of the thermal/acoustic insulation

material following in-service experience and thus prevent or lower the risk of fires spreading.
The second objective of the NPA was to improve the fuselage *flame penetration resistance* that those materials provide. Taking into account the fact that thermal/acoustic insulation materials are being addressed anyway by this NPA because of their flame propagation resistance characteristics, it was considered advantageous to use this opportunity and improve the flame penetration resistance.

Moreover, the harmonisation argument has continuously been stressed by the manufacturing industry as being of extreme importance. Therefore and because of the overall increase of safety the option 2 is still the Agency preferred option.

A. Explanatory Note - V. Regulatory Impact Assessment - 4. Impacts p. 10-13

comment *19* comment by: *AIRBUS*

Paragraph V.4.a.ii:

- At the time of the rule promulgation, the FAA based the cost on simple material change that would satisfy the rule. In reality, the rule required the industry to make additional research and development for the test apparatus, which cost time and therefore money. These costs have never been included in the rule and have a significant impact on the overall cost. Furthermore, the extent of the technical work to comply with the rule goes beyond a simple material replacement and leads to significant aircraft design changes. Airbus strongly recommends to EASA to investigate upon EU manufacturers the real cost figures when the forward fit rule is going to be proposed.
- The weight penalties associated to the introduction of the rule are high for the flame penetration rule, and EASA should carefully consider the actual cost/safety benefit of this part of the rule. Material R&D completion, the target weight, durability and cost to be equivalent to existing materials (films and/or batting) are not close to the FAA figures. Only a few materials, mostly ceramic-based films, are available that satisfy the flame penetration test requirement. These materials add significantly more weight - from 50 Kg for a single aisle aircraft to 160 Kg for twin aisle aircraft - than originally projected. The economic impact for this weight gain due to additional fuel burn exceeds $400 million, whereas the economic impact projected by the FAA was far below this estimation.
- The maintenance costs for the operators shall not be neglected, as the insulations can neither be removed nor damaged for airworthiness reasons.

response *Partially accepted*

Concerning the cost of material change, the commentator is right, the NPA does not reflect properly the costs induced in terms of weight increase, additional fuel burn costs and maintenance costs. A quick evaluation done by the Agency based on current weight increase (50-150 Kg) on relevant fleet at the nowadays fuel price gives an estimation very close to the one performed by the Industry.

Nevertheless, the economic impact of the EASA rulemaking is lower than FAA one, knowing that the whole Industry has already made all the efforts in terms of research and development. The EASA rule being fully harmonised with FAA, no additional costs are foreseen for compliance.

In addition, the Agency considers that despite the high economic impact, this new rule has very important safety benefits. In fact the safety gain is considered important enough to seriously considering imposing the requirements not only to new designs but also to newly manufactured aircraft of existing design and to existing aircraft when the insulation material has to be removed for maintenance reasons. In addition, full harmonisation with FAA brings also a lot of advantages for the whole Industry.

A. Explanatory Note - V. Regulatory Impact Assessment - 5. Summary and Final Assessment p. 13-14

comment *8* comment by: *Walter Gessky*

The content of the NPA is supported by the Austrian Ministry of Transport, Innovation and Technology, but due to the safety impact to the existing fleet, retroactive activities are required.
It is therefore required and Austria will support the initiative from EASA to propose in the NPA 26-17 a text technically harmonised with the FAA.
We recommend to initiate the rulemaking task as soon as possible.

response *Noted*

See response to comment nr. 7.

B. DRAFT DECISIONS - Proposal 1 - add new para CS 25.856 p. 15

comment *4* comment by: *Francis Fagegaltier Services*

CS 25.856 (a)

The wording "other approved equivalent test requirements", certainly coming from the FAR text, is unclear in EU context. Indeed, according to 21A.263 (b), the Agency has no right to control what is done by the designer when showing compliance with CS-25.

Contrary to FAR 25 where "approved" means "approved by FAA" or contrary to JAA (with a different JAR-21.263) when "approved" meant "approved by the National Authority", here "approved" is not defined.

Where and how can a designer find these alternative test requirements?

response *Not accepted*

In this context, "approved" means "approved under the authority of the Design Organisation or by the Agency".
According to 21A.263, the Agency provides the Design Organisations with

privileges. Anyhow, according to 21A.257, the Agency can review any report and make any inspection and perform or witness any flight and ground test necessary to check the validity of the compliance statements submitted by the applicant under 21A.239(b).

Concerning the alternative test requirements, if the Design Organisation does not elect to apply the tests described in Appendix F, it is up to its organisation to define other tests, and make them approved in accordance with Part-21.

comment

5 comment by: *Francis Fagegaltier Services*

CS 25.856 (b)

We find again the words "or other approved equivalent test requirements": see comment on 25.856 (a).

In addition, the last sentence cannot fit at all in the EU context, because of Part 21, paragraph 21.A263 (b) : the designer should be capable of interpreting and applying CS-25 without interference by EASA. This sentence should be modified to eliminate reference to "the Agency".

response

Not accepted

See response to comment nr. 4.

The Design Organisation can voluntarily apply 25.856(b) on all materials installed in the lower part of the fuselage. For a thermal/acoustic insulation installation in the lower part of the fuselage that the Design Organisation would consider as non applicable, it is then Agency's role to validate the non applicability as per CS.

B. DRAFT DECISIONS - Proposal 4 - Add a new Part VI into App F p. 16-27

comment

20 comment by: *AIRBUS*

Paragraph (a) Definitions:
Proposed Text:
"(a) ''Radiant heat source'' means an electric **~~or air propane~~** panel."
Justification:
The air propane panel is no longer used by the labs to perform the tests. All material related to this heat source should be deleted from the rule.

response

Not accepted

The Appendix F Part VI clearly mentions the electric panel and air propane panel as means of compliance. Even if the propane panel is not used anymore, it still provides an acceptable means of compliance.

For the purpose of harmonisation with FAA, the Agency prefers not to change the appendix F. Appendix F Part VI should be considered as one acceptable means of compliance with CS 25.856 (a). Any other test can be developed by the Design Organisation, as per CS 25.856.

comment	*21* comment by: *AIRBUS* Paragraph (b) Test apparatus: Proposed text: It is proposed to delete paragraph (b) 2. Radiant heat source, as well as Figure 3b - Air Propane Radiant Panel. Justification: The air propane panel is no longer used by the labs to perform the tests. All material related to this heat source should be deleted from the rule.
response	*Not accepted* See response to comment nr. 20.

comment	*22* comment by: *AIRBUS* Paragraph (b) (1): • The use of Kaowool is prohibited in Europe and in California. FERMACELL TM is used instead but Airbus recommends specifying the objective instead of referencing a trademark. • Airbus proposes to replace the sentence: "The bottom of the test chamber must be a sliding steel platform that has provision for securing the test specimen holder in a fixed and level position" by the sentence: "The bottom of the test chamber must be a sliding steel platform ***frame (closed at the bottom)*** that has provision for securing the test specimen holder in a fixed and level position". GENERAL COMMENT (From Page 16 to page 42): For all units (especially the ones that are shown in the figures - but not limited to), the S.I. units shall be mentioned first, and in brackets the equivalent in inches. GENERAL COMMENT (From Page 16 to page 42): All dimensions shall be indicated with tolerances. Even if tolerances are not indicated in the FAA rule, experience has shown that it is technically impossible to comply without tolerances. It would be tremendous work trying to specify tolerances for all the given dimensions in the frame of these comments. However, Airbus is ready to assist EASA in specifying practical tolerances for the final rule.
response	*Partially accepted* • The Agency agrees that a trade mark is not the most appropriate way to define test conditions. Nevertheless, using brand names can be the easiest way for an applicant to know which device can be used to ensure that the test fully complies with the rule. In the spirit of being fully harmonised with FAR 25, the Agency does not intend to remove those brand names. Anyway the Kaowool is mentioned as an example of compliant material but other materials are not excluded. Any other material will be considered by the Agency (see response to comment nr. 20). • The sentence proposed about the test chamber has the same meaning as the one proposed in the NPA. So in order to keep fully harmonised

with FAA rule, the Agency prefers not to change the sentence.

Concerning the general comment related to the units used in the figures and the order to mention them:
The Agency agrees that the preferred way of using units of measurement is as described by the comment provider. For all the text and some of the figures this is implemented. In some figures the reverse notation is used but this is not considered to influence the readability nor the clarity of the rule. Nevertheless the Agency accepts a general task for the future to clean all Certification Specifications to comply with the general policy for the use of units of measurement.

Concerning the general comment about tolerances, please note that the dimensions are part of the AMC. Any different dimension would be considered by the Agency. In addition, the Agency prefers not to deviate from FAA regulation to keep harmonised texts. So the tolerances will not be added in the Appendix F Part VI.

comment

23 comment by: *AIRBUS*

Paragraphs (b) (6) & (8):
For both paragraphs 6 and 8, Airbus recommends to give the performance objective of the system rather than giving its detailed specification. Based on the problems experienced with the FAA rule, EASA should really take benefit of all the work that has been performed. In CS 25, EASA could use the lessons learned and give only the framework for the test, like the heat flux to be measured at a given position, and a range of measurements the calorimeter shall be capable of.

response

Partially accepted

The Agency will use the lessons learnt from the FAA researches by adding the reference to AC 25.856-1 and 25.856-2A as AMC. Those ACs give additional methods and procedures coming from experience as well as extensive research to complete the appendix F. Please refer to the response to comment nr. 39 and the associated substantiation data for not up-dating the Appendix F (Part VI and VII).

comment

24 comment by: *AIRBUS*

Figure 7:
In addition to the comments already made on the SI units, and on the need to incorporate tolerances for all the given dimensions, Airbus recommends to transfer the 51mm (2in) dimension from the holding frame to the position "0" on the figure. This dimension is described in the text, but needs to be transferred on the figure as well.

response

Not accepted

Concerning the units and tolerances, please refer to response to comment nr. 22.

Concerning the figure itself and the dimension "2 inches", the Agency believes there will be no benefit in transferring this data on the figure. The Agency believes the figure and its dimensions are already clear.

comment 25 comment by: *AIRBUS*

Paragraph (c) (3):
Tolerances shall be incorporated everywhere. The realization of specimen without tolerances is not practical.

response *Not accepted*

Please see response to comment nr. 22 concerning the tolerances not to be included in Appendix F Part VI.

comment 26 comment by: *AIRBUS*

Table 1:
Airbus proposes to replace the Table 1 by the following:

Position	Heat Flux(BTU's/ft2 sec)	Heat Flux (Watts/cm2)	Deviation (%)
Zero position	1.5	1.7	± 5
Position 1	1.50	1.70	± 5
Position 2	1.43	1.62	± 5

Justification:
The allowable deviation for the "Zero" position should be extended to Positions 1 and 2. Experience shows that deviations below 5% are not achievable.
In order to make the table clearer, Airbus proposes to give the permitted deviations (tolerances) in a separate column.

response *Not accepted*

The comment proposes to add tolerances in the table of heat flux measurement.

Please see response to comment nr. 22.

comment 27 comment by: *AIRBUS*

Paragraph (h):
Airbus proposes to complement the paragraph (h) as shown:
"(h) Requirements.
(1) There must be no flame propagation beyond 51 mm (2 inches) to the left of the centerline of the pilot flame application.
(2) The flame time after removal of the pilot burner may not exceed 3 seconds on any specimen.
In addition, the following is an acceptable method of addressing failure of propagation length if one of the three samples does not pass.

To reach a passing criteria, a minimum of 7 additional samples may be tested. None of these additional samples can fail either criterion. In addition, the average of all of the samples, including the sample that originally failed, must meet the pass/fail criteria.
For after-flame time only, it is possible that certain materials with good propagation protection characteristics can show modest after-flame time, beyond the 3-second limit. There are two ways that this can be addressed to determine if the material is acceptable.
(a) In a manner similar to the procedure identified in paragraph 4c(1) above, test an additional 7 samples. If the average of the after-flame times for all 10 samples is 3 seconds or less the material can be accepted. Note that, as required in the rule, the propagation distance must not exceed 2 inches on any sample.
(b) In some cases, after-flame can be attributed to the specific 15-second exposure time in the test. Since the exposure time was mainly derived from tests on thin film materials, extended exposure may be meaningful for other types of materials. If the after-flame time is above the limit but the material does not propagate, it is acceptable to apply the burner flame for 30 seconds. The same pass/fail criteria are applied, and if the material passes with a 30-second exposure it can be used. The earlier tests with a 15-second exposure may be disregarded."

Justification:
The intent of the rule is to limit the requirements for thermal/acoustic insulation to materials that do not propagate a fire. "Zero" propagation requirement is impractical to implement, therefore, as written in FAA AC 25.856-1, 5§4 BACKGROUND, c. Test method), Airbus proposes to include reasonable pass/fail criteria directly in the rule. Indeed, the requirements proposed in FAA and EASA rules are a stringent test method. Certain materials have slightly greater propagation characteristics and do not meet the requirement. In some cases this may be due to a non-properly constructed test sample or a variation in the test procedure. Based on the Industry experience, it would be appropriate to incorporate the proposed text directly in the EASA rule. Should EASA reject this proposal, direct cross-reference to the appropriate advisory material should be made (AC 25.856-1, Paragraph 4, Background, C., Test Methods).

response *Partially accepted*

The acceptable method of addressing failure of propagation length proposed by the commentator is already described in AC 25.856-1. This AC is referred to in AMC 25.856(a). So the Agency does not plan to update the Appendix F Part VI as it is covered in AMC. See response to comment nr. 39.

B. DRAFT DECISIONS - Proposal 5. Add a new Part VII into App F p. 28-42

comment *3* comment by: *Francis Fagegaltier Services*

General comment on burners used for fire tests.

An international standard was established to define acceptable burners for fire tests, together with appropriate calibration methods to ensure accuracy and repetitivity of testing. The secondary goal of this standardisation was to avoid referring to commercial brand names. This is ISO 2685 standard, which is

	referenced in CS-25 (AMC 25.1181) and CS-E (AMC E.130), at least. This NPA 2008-13 creates new burners and identifies them by proprietary trade marks such as Park Model DPL 3400 or Bernzomatic. This is not appropriate in general : certification specifications should not promote devices sold by private companies. Furthermore, it is not possible to find an alternative to such burners : how is defined a burner "equivalent" to Bernzomatic ? The characteristics of the Bernzomatic burner are not given : then no one can define an equivalent to something which is not defined. In proposal 5, the following sentences : "Flame characteristics are highly dependent on actual burner setup. Parameters such as fuel pressure, nozzle depth, stator position, and intake airflow must be properly adjusted to achieve the correct flame output » are 100% true. This was the one of the purposes of ISO 2685 : to define burners and calibration methods which would eliminate such uncertainties ! Could the Agency explained why it refers to commercial brand names instead of referring to "neutral" international standards ?
response	*Noted* This comment can be divided in 3 parts: The first one refers to commercial brand not to be used in rules. The Agency agrees that a trade mark is not the most appropriate way to define test conditions. Nevertheless, using brand names can be the easiest way for an applicant to know which device can be used to ensure that the test fully complies with the rule. In the spirit of being fully harmonised with FAR-25, EASA does not intend to remove those brand names. The second comment refers to the use of standard ISO 2685. The Design Organisation can choose to use burners as defined by this standard if the characteristics are proven to be the same. EASA does not intent to add any additional burner reference/standard that is not part of FAR 25 rule. The third comment refers to characteristics of burners. Basic characteristics of the burners are given in Appendix F Part VI and VII and it is up to the Design Organisation to choose or define any other burner.
comment	*28* comment by: *AIRBUS* Paragraph (b) (2): Proposed text: "(2) Test burner. The test burner must be a modified gun-type such as the Park Model DPL 3400 ***or equivalent***. Flame characteristics are highly dependent on actual burner setup. Parameters such as fuel pressure, nozzle depth, stator position, and intake airflow must be properly adjusted to achieve the correct flame output." Justification: Following the difficulties met with the compliance with the FAA rule, Airbus highly recommends to keep EASA rule very generic with respect to the test apparatus: CS25 should only specify the burner performances, the heat source... The means to achieve these objectives should not be prescribed.

EASA should take benefit of all the activities that have been carried out by the FAA TC and the Industry, and thus let the flexibility to use alternate or equivalent apparatus and method.

response

Accepted

The text will be amended accordingly.

comment

29 comment by: *AIRBUS*

Paragraph (b) (i):
Proposed text:
(i) Nozzle. ~~A nozzle must maintain the fuel pressure to yield a nominal 0.378 l/min (6.0 gal/hr) fuel flow. A Monarch manufactured 80° PL (hollow cone) nozzle nominally rated at 6.0 gal/hr at 100 lb/in2 (0.71 MPa) delivers a proper spray pattern~~. The nozzle shall maintain a nominal fuel flow of 22,7 +/- 0,76 dm3/h.

Justification:
The Monarch nozzle rated at 6.0 gal/hr is no longer available. 6.5 gal/hr nozzles are currently used.
Airbus recommends the following wording: The nozzle shall maintain a nominal fuel flow of 22,7 +/- 0,76 dm3/h. The details should be shifted to the AMC that should itself refer to the final AC25.856-2A.
As mentioned in a separate comment, if EASA maintains this level of details in the rule, there will be no ways to achieve compliance to the rule as it is written.
To publish the rule, EASA waited until availability of solutions for the test apparatus. Nevertheless, the proposed changes to CS25 do not take into account any of the solutions that have been found by the FAA TC and the Industry to cope with the problems met.
Note that it would be tremendous work to comment the entire paragraph, since the test apparatus and the test method have evolved according to AC 25.856-2A and other FAA recommendations. So, if EASA is interested in getting support in writing the final rule, Airbus is ready to share its experience and knowledge with EASA on the implementation of the FAA rule in order to help the preparation of a workable final document.

response

Not accepted

Here, the Agency provides an example of nozzle which provides the right results. This nozzle specification is not the only means for demonstrating compliance with the requirement. The AMC 25.856(b) (AC 25.856-2A) gives additional nozzle specifications in case the Monarch one is not available anymore. So as described in the response provided to comment nr. 39, the Agency does not plan to update Appendix F Part VII.

comment

30 comment by: *AIRBUS*

Paragraph (b) (vi):
Proposed text:
Fuel. Use JP-8, Jet A, or their international equivalent, at a flow rate of 0.378 ± 0.0126 l/min (6.0 ± 0.2 gal/hr). ~~If this fuel is unavailable, ASTM K2 fuel (Number 2 grade kerosene) or ASTM D2 fuel (Number 2 grade fuel oil or Number 2 diesel fuel) are acceptable if the nominal fuel flow rate, temperature, and heat flux measurements conform to the requirements of paragraph (c) of~~

~~Part VII of this Appendix.~~

Justification:
Airbus proposes to delete the sentence, as only kerosene is used.

response

Not accepted

The commentator proposes to delete reference to different kinds of fuels which are not used anymore.
Even if all fuels are not used anymore, they still could be used as acceptable means of compliance. In the objective of full harmonisation with FAA, the Agency prefers not to update Appendix F Part VII as the information does not lead to misunderstanding.
See response to comment nr. 39.

comment

31 comment by: *AIRBUS*

Figure 3:
"Material: 0.050" (1.3 mm) stainless steel":
In addition to the SI Units that should be mentioned first and the tolerances that should be added on the figure, Airbus recommends to delete the thickness of material that shall be used.

response

Not accepted

Concerning the units and the tolerances please refer to response to comment nr. 22.
Concerning the thickness of the material, Appendix F Part VII gives one acceptable means of compliance. Different set-up can be considered and accepted as per CS 25.856(b). AC 25.856-2A provides alternative acceptable means of compliance and can be used in accordance with modified AMC 25.856(b).
In addition, for harmonisation with FAA the Agency prefers not to update the Appendix F Part VII. Please refer to the response to comment nr. 39.

comment

32 comment by: *AIRBUS*

Paragraph (b) (3) v:
Proposed text:
"(v) Air velocity meter. Use a vane-type air velocity meter to calibrate the velocity of air entering the burner. An Omega Engineering Model HH30A ***or equivalent*** is satisfactory. Use a suitable adapter to attach the measuring device to the inlet side of the burner to prevent air from entering the burner other than through the measuring device, which would produce erroneously low readings. Use a flexible duct, measuring 102 mm (4 inches) wide by 6.1 meters (20 feet) long, to supply fresh air to the burner intake to prevent damage to the air velocity meter from ingested soot. An optional airbox permanently mounted to the burner intake area can effectively house the air velocity meter and provide a mounting port for the flexible intake duct."
Justification:
The Omega Engineering Model HH30A is no longer available. Therefore Airbus proposes either to add "or equivalent", or to delete completely the references of the equipment.
The rule, in general should not refer or mention the names of the suppliers. The reasons are:

- The supplier may change his name or disappear - and consequently the rule cannot be any longer fulfilled as it is.
- Suppliers that are nominated in the rule take the opportunity to raise the price of an equipment that is suddenly promoted as a "certification" tool.

response

Accepted

The text will be amended accordingly.

For the brand name, please refer to the response to comments nr. 3 and nr. 22.

comment

33 comment by: *AIRBUS*

Paragraph (b) (4):
Proposed text:
"(4) Test specimen mounting frame. Make the mounting frame for the test specimens of ~~***3.2 mm***~~ ***3 +/- 1 mm (⅛-inch)*** thick steel as shown in figure 1, except for the centre vertical former, which should be 6.4 mm (¼-inch) thick to minimize warpage. The specimen mounting frame stringers (horizontal) should be bolted to the test frame formers (vertical) such that the expansion of the stringers will not cause the entire structure to warp. Use the mounting frame for mounting the two insulation blanket test specimens as shown in figure 2."

Justification:
3,2 mm is not practical. Airbus suggests to specify 3mm with 1mm tolerance, which would be easier to realize. Nevertheless, it is Airbus opinion that giving this dimension in the rule is not necessary.

response

Not accepted

For the tolerances, please refer to response to comment nr. 22.

comment

34 comment by: *AIRBUS*

Paragraph (b) (8):
Proposed text:
"(8) Test chamber. Perform tests in a suitable chamber to reduce or eliminate the possibility of test fluctuation due to air movement. The chamber must have a minimum floor area of 305 by 305 cm (10 by 10 feet). ***It must be ensured that the vertical air velocity just behind the top of the upper insulation blanket test specimen (material test) is 0.51 +/- 0.255 m/s (100 +/- 50 ft/min) and the horizontal air velocity at this point is less than 0.255m/s (50ft/min).***"

Justification:
Air movement are influenced by the floor area, but also by the height of the test chamber. Airbus proposes to give additional criterion to minimize even more the air movement.

response

Not accepted

The Agency acknowledges that air movement may have an influence on test results. However, this additional criterion may be considered as part of an acceptable means of compliance to be presented by the applicant.

CS-25 refers to "Appendix F to CS-25 or other approved equivalent test requirement" which gives the possibility for the Agency to consider any other test condition. For harmonisation with FAA the Agency prefers not to update the Appendix F Part VII.

comment 35 comment by: *AIRBUS*

Paragraph (c) (3):
The rule is limited to the test of the material whereas certain designs shall also be tested (refer to the AC). Therefore, Airbus would as well incorporate a clear reference to the AMC - which refers to the AC.

response *Partially accepted*

The text will be amended so that CS 25.856 (a) and (b) clearly refer to AMC 25.856 (a) and AMC 25.856 (b).

See resulting text:
"Book 1
SUBPART D - DESIGN AND CONSTRUCTION
….

CS 25.856 Thermal/acoustic insulation materials
(See AMC 25.856 (a) and AMC 25.856 (b))
[…]"

Appendix F Part VI and VII being part of CS.25.856 to which AMC 25.856 applies, no additional reference to AMC is necessary in Appendix F.

comment 36 comment by: *AIRBUS*

Paragraph (c) (3):
The note reads:
"For blanket materials that cannot be installed in accordance with figure 7 above, the blankets must be installed in a manner approved by the Agency."

- Airbus strongly opposes to this note. Figure 7 is showing one specific installation, which is based on one manufacturer's specific design. Airbus installation principles are different but as well acceptable. It should not be the intent of a rule to prescribe a given design solution.
- The final AC 25.856-2A gives other alternatives that are as well acceptable for the FAA without getting additional approval. The FAA made an extended review of numerous installations and installation concepts that have led to a common application of these provisions. EASA should not ignore the research already made. Knowing that the compliance date for the FAA is now very close, the designs are already frozen, the industrialization of the rule nearly completed and certification will be done using the FAA latest available guideline (AC 25.856-2A). Airbus appreciates the efforts made by EASA to fully harmonize the rule - but EASA shall be aware that complying with the rule, as it is written today, is only possible with the help of the latest

guidance material provided by the FAA. Airbus therefore really insists on the need to harmonize the compliance demonstration and the acceptable means of compliance.
- Last but not least, the AC 25.856-2A or interim FAA guidance list installations that do not have to be modified to comply with the rule. (See AC 25.856-2A paragraph 9.)

With respect to the note, Airbus suggests that EASA takes over the wording of the FAA guidance given in this final AC 25.856-2A and copy it in the AMC. (or provides direct cross-reference)

response *Partially accepted*

Appendix F to CS 25.856 refers to a specific test requirement. However, the test requirement in the Appendix is not the only one acceptable. CS 25.856 (b) states that an applicant must "meet the flame penetration resistance test requirements of Part VII of Appendix F to CS-25, or other approved equivalent test requirements." So any other installation/method can be proposed by the Design Organisation and can be considered by the Agency.

In addition, AMC 25.856(b) will give direct cross reference to AC 25.856-2A, as mentioned in the response to comment nr. 39. This AC giving alternative flammability tests method conditions is approved by the Agency. Any other tests set-up can be considered by the Agency.

comment *37* comment by: *AIRBUS*

Paragraph (h):
The FAA recognizes in the AC 25.856-2A that the test method of Appendix F, part VII to Part 25 was too stringent, as it requires that all samples meet the pass/fail criteria specified. However, there may be occasionally statistically predictable failure of a material that satisfies the criteria. In order to address this situation without permanently banning this material from use, as it is acceptable for the FAA that initiated the rule, additional criterion should as well be acceptable to EASA and clearly written either in the rule or in the AMC:

"The following is an acceptable procedure to address a sample failure. To use the following procedure, only one of the three original sample sets may fail:
(1) Test a fourth sample set and average the burnthrough time results. If the average exceeds 4 minutes, the material may be used, provided the fourth sample passes the test.
(2) If the fourth sample set should also fail the test, it is acceptable to test an additional two sample sets (for a total of 6) and average the results. If four of the six sample sets pass the test, and the average burnthrough time exceeds 4 min, the material can be used.
(3) Consider using materials from more than one lot/batch to make the additional test samples."

response *Partially accepted*

The comment addresses the case of a sample failure and proposes alternative means of compliance. This means of compliance is already described in AC 25.856-2A. This AC will be referred to in AMC 25.856(b) in lieu of AC 25.856-2. So the Agency does not consider that the Appendix F Part VII should be updated.
See response to comment nr. 39.

resulting text

Book 1
SUBPART D - DESIGN AND CONSTRUCTION
....
"CS 25.856 Thermal/acoustic insulation materials
(See AMC 25.856 (a) and AMC 25.856 (b))"
[...]"

Appendix F Part VII

Paragraph (b) (2)
"(2) Test burner. The test burner must be a modified gun-type such as the Park Model DPL 3400 ***or equivalent***. Flame characteristics are highly dependent on actual burner setup. Parameters such as fuel pressure, nozzle depth, stator position, and intake airflow must be properly adjusted to achieve the correct flame output."

Part VII into App F
Paragraph (b) (3) v
"(v) Air velocity meter. Use a vane-type air velocity meter to calibrate the velocity of air entering the burner. An Omega Engineering Model HH30A ***or equivalent*** is satisfactory. Use [...]."

B. DRAFT DECISIONS - Proposal 6 - Add new AMC 25.856(a) and AMC 25.856(b) p. 43

comment

1 comment by: *Francis Fagegaltier Services*

AMC 25.856(a)
The FAA AC should be submitted to review by EU citizens as part of this NPA, to give them the opportunity of reviewing it and commenting on it, in compliance with article 52, 1 of Basic Regulation 216/2008.

response

Noted

FAA AC 25.856-1 and FAA AC 25.856-2 are referred to in AMC 25.856 (a) and (b). This AMC, including the references to FAA ACs were open for comments. This means that also the contents of these ACs were part of the NPA and were subject to possible comments. The links to the websites where those ACs can be found have been provided in the NPA The FAA ACs are in the public domain and could have been consulted by any person. Moreover, the FAA ACs have been submitted for public consultation by the FAA and since they affect also European Industry, were commented by these stakeholders.
Finally these ACs describe acceptable means, but not the only means for demonstrating compliance with the applicable regulations. Any other method will be considered by the Agency.

comment

2 comment by: *Francis Fagegaltier Services*

AMC 25.856(b)
The FAA AC should be submitted to review by EU citizens as part of this NPA, to give them the opportunity of reviewing it and commenting on it, in

compliance with article 52, 1 of Basic Regulation 216/2008.

response

Noted

See response to comment nr. 1.

comment

38 comment by: *AIRBUS*

Paragraph AMC - Subpart D:

Proposed text:
"AMC 25.856(a)
Thermal/acoustic insulation materials: Flame propagation resistance
FAA Advisory Circular 25.856-1 Thermal/Acoustic Insulation Flame Propagation Test Method Details, dated 24/06/2005, ***or any later approved revision***, is accepted by the Agency as providing acceptable means of compliance with CS 25.856(a) and Part VI of Appendix F to CS-25.
AMC 25.856(b)
Thermal/acoustic insulation materials: Flame penetration (Burnthrough) resistance
FAA Advisory Circular 25.856-2***A*** Installation of Thermal/Acoustic Insulation for Burnthrough Protection, dated 29/07/2008, ***or any later approved revision***, is accepted by the Agency as providing acceptable means of compliance with CS 25.856(b) and Part VII of Appendix F to CS-25."

Justification:
The results of the work performed since the publication of the rule by the FAA on FAR 25.856(a) and (b) are accurately documented in the AC 25.856-1 for the flame propagation, and now in the AC 25.856-2A for the flame penetration. Until the publication of the final AC 25.856-2A, the industry was working with the draft AC 25.856-2X, amended with additional guidance papers specific to each labs, which led to the final AC 25.856-2A. EASA should therefore refer to the later approved revisions of the ACs (AC25.856-2A for the flame penetration).
Note: Airbus is making the certification test with the NexGen Burner, calibrated with FAA TC, witnessed by EASA.

response

Partially accepted

The cross reference to AC 25.856-2 is updated to AC 25.856-2A.

The policy of the Agency regarding cross-references to external documents, which are not under the control of the Agency, is to refer only to a fixed issue of that document including revision number and issue date. By using this policy the Agency always keeps control over the contents of its own documents. It is also the Agency's policy to put cross-references to external documents only in AMC or GM. It will then always be possible for an applicant to use later revisions of the same document if these are found acceptable.