



## **Large Surface Areas on Seats Acceptable Method of Compliance**

IAMFTWG June 22/23, 2011



## Large Surface Areas on Seats Acceptable Method of Compliance

- 25.853 does not require non-metallic materials installed on seats to comply with Heat Release/Smoke Emission requirements Background
- When Heat Release/Smoke Emission requirements were introduced in FAR 25 in 1988, full scale testing had shown that the contribution of non-metallic panels installed on seats to a post-crash fire could be considered negligible.
- Back in the 1980s seat cushions used to constitute the most significant share of non-metallic material installed on seats. Part II of Appendix F was deemed sufficient to address the contribution of seats to a post-crash fire



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Since then seat design has significantly evolved:

- privacy features (back shells, dividers, sidewalls, etc.)
- increased stowage capability through the installation of larger seat-associated furniture
- the amount and the size of non-metallic panels have increased to the point that their contribution to a post-crash fire could not be ignored anymore.
- The FAA issued Policy Memos to highlight that seat associated furniture to be considered interior components and therefore are required to comply with part IV and V of App. F.
- Evolved to development of special conditions after reviewing the regulatory basis.



# Large Surface Areas on Seats Acceptable Method of Compliance

- ▶ Two Main Compliance Questions
  - ▶ When to implement the special conditions
  - ▶ How to determine whether something is covered by the special conditions
- ▶ Industry Formed a working group to recommend solutions
- ▶ Authorities participated in the forming of the recommendations



# Large Surface Areas on Seats Acceptable Method of Compliance

- The HR/SE SC define new requirements but do not specify **how to show compliance**
- The Special Conditions introduce new terminology, e.g. ***non- traditional, large, non-metallic panels*** or ***new seat certification program*** but do not provide clear definitions
- the criteria for **applicability** of the special conditions are not clear enough
- In April 2009 EASA realized to have a different position with respect to the FAA regarding testing **coverings** glued on panels required to comply with the Special Conditions



# Large Surface Areas on Seats Acceptable Method of Compliance

## Applicability

- EASA/FAA/TCAA/ANAC developed fully harmonized criteria to determine the applicability of the Special Conditions
- Different criteria apply to new deliveries of aeroplanes
- The developed criteria better define the meaning of *new seat certification program*



# Large Surface Areas on Seats Acceptable Method of Compliance

## Applicability – Newly manufactured aeroplanes

	New Customer	Same Customer, New A/C Model (new family or new derivative)	Same Customer, New Block of A/C	Same Customer, Same Block, New seat count
Same Seat P/N				
New Seat P/N, no change to large panels	✓			
New Seat P/N, changes to large panels	✓	✓	✓	✓
New Seat Model	✓	✓	✓	✓

✓ = seats must comply with SC

See Notes on next page



# Large Surface Areas on Seats Acceptable Method of Compliance

## Applicability – Newly manufactured aeroplanes

1. "New Customer" relates to a situation where Airline "A" has, for example, 737-700 airplanes certificated with seats with large non-metallic panels prior to the issuance of special conditions. Airline B, after the effective date of the special conditions, purchases 737-700 airplanes and may (or may not) have exactly the same seating configuration as Airline "A."
2. "Same Customer, New Model" means if Airline "A" has, for example, 737-700 airplanes certificated with seats with large non-metallic panels prior to the issuance of special conditions. The Airline now purchases 767, or 737-800 airplanes and installs seats in the new model 737 after the issuance of the special conditions.
3. "Same Customer, New Block of A/C" means if Airline "A" has, for example, A320-200 airplanes certificated with seats with large non-metallic panels prior to the issuance of special conditions. The Airline now purchases, after the effective date of the special conditions, additional A320-200 airplanes.
4. "Same Customer, Same Block, New seat count" means if Airline "A" has, for example purchased 50 737-900 airplanes and the first of this block of 50 airplanes has been type certificated with seats with large non-metallic panels prior to the issuance of special conditions. Then on the 15<sup>th</sup> airplane to be delivered (which is after the effective date of the special conditions), the Airline decides to increase the number of first class seats in the airplane and reduce the number of economy class seats.
5. "Same seat P/N" means a seat that is unchanged. In the case where the same P/N is retained, but changes are made to all seats with that p/n (i.e., the prior configuration is eliminated on the drawing and in the field), this is considered as "New" for the purposes of implementation of the special conditions.
6. "Customer" refers to the end user, and not a leasing company, that supplies many operators.





# Large Surface Areas on Seats Acceptable Method of Compliance

## Applicability – Changes introduced after delivery

	Installation of existing arrangement for fleet commonality	Re-arrangement (or removal) of existing seats (no additional seat installations)	New Installation of seats
Same Seat P/N			
New Seat P/N, no change to large panels			✓
New Seat P/N, changes to large panels	✓	✓	✓
New Seat Model	✓	✓	✓



# Large Surface Areas on Seats Acceptable Method of Compliance

## Applicability – Changes introduced after delivery

1. “Same”, or “new” with respect to seat P/N refers to authority approval status, and whether there is an installation approval, even if it was granted to someone else. The applicant is responsible for both identifying and supplying evidence of the prior approval
2. “Fleet commonality” means the installer already has this arrangement in their fleet, and is configuring other airplanes to match. Modification is being performed by other than airframe mfr.
3. “Re-arrangement” means the seats are moved around, or maybe some are removed, but no additional seats are installed.
4. “New Installation of seats” means that the modification includes installation of more (Row 1) or different (Rows 2-4) seats than the current arrangement. Includes both a new installation as well as adding to an existing arrangement.
5. With respect to Row 2, column 3, when the same operator/user obtains a post-TC approval (e.g., via STC), to essentially provide fleet commonality with the arrangement as delivered from the factory, R2:C1 would apply instead. Where a customer/user is obtaining a new installation approval for a new P/N, which happens to be similar to another customer’s approval, the special conditions would apply.



## Definitions

- **Panel**
- **Nonmetallic**
- **Large**
- **Exposed**
- **Traditional**



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## Traditional vs. Non-Traditional

- Definitions for Traditional or Non-Traditional are specific to different features of a seat.

Head Rests  
Privacy Dividers  
Center Consoles  
Arm Rests and Armrest Closeouts  
End Bays  
Rub Strips / Bumpers  
Leg Rests  
Foot Bars  
Line Replaceable Units



Seat Pans  
Shrouds  
Seat Primary Structure  
Life Vest Containers

Seat Backs  
Food Trays  
Shells  
Monitors and Bezels  
Literature Pockets  
Kick Panels  
Foot Wells

Independent Furniture  
Safety Features



# Large Surface Areas on Seats Acceptable Method of Compliance

Item	MOC slide number	Industry proposal including 10% buffer (in square inches)	Industry proposal without 10% buffer (in square inches)	Limits identified by the AAs (in square inches)
Centre consoles	21-22	1208	1098	<b>1008</b>
Seat end closeout	23-24	378	344	<b>344</b>
End bay	25-26	1186	1078	<b>1008</b>
Armrest closeout	25-27	576	524	<b>432</b>
footbars	30-31	152	138	<b>108 with non-metallic support bar / 72 with metallic support bar</b>
Food trays	35-36	231	200	<b>200</b>
Video bezel	38	n/a	115	<b>115</b>
Kick panels	41-42	213 (per seat place)	193.5 (per seat place)	<b>144 (per seat place)</b>



# Large Surface Areas on Seats Acceptable Method of Compliance

## Coverings 1/3

- EASA SC CRI D-43 (A380), reads:  
*Non-traditional, large, non-metallic panels covered with fabrics or leathers in a more “traditional” way (e.g. only affixed around the edges) will be tested without their coverings. However, non-traditional, large, non-metallic panels covered with fabrics which are affixed all over (e.g. glued) will be tested with their coverings.*
- In April 2009 the FAA clarified that large non-metallic panels covered with traditional fabrics or leathers will be tested without their coverings, regardless of the method of attachment.
- EASA has decided to maintain the position outlined in CRI D-43. At the moment this is the only aspect that is not harmonized between the FAA and EASA Special Conditions. However, the FAA has clarified that showing compliance with the EASA SC, i.e. testing panels together with their coverings, is acceptable to show compliance also with the FAA SC.



# Large Surface Areas on Seats Acceptable Method of Compliance

## Coverings 2/3

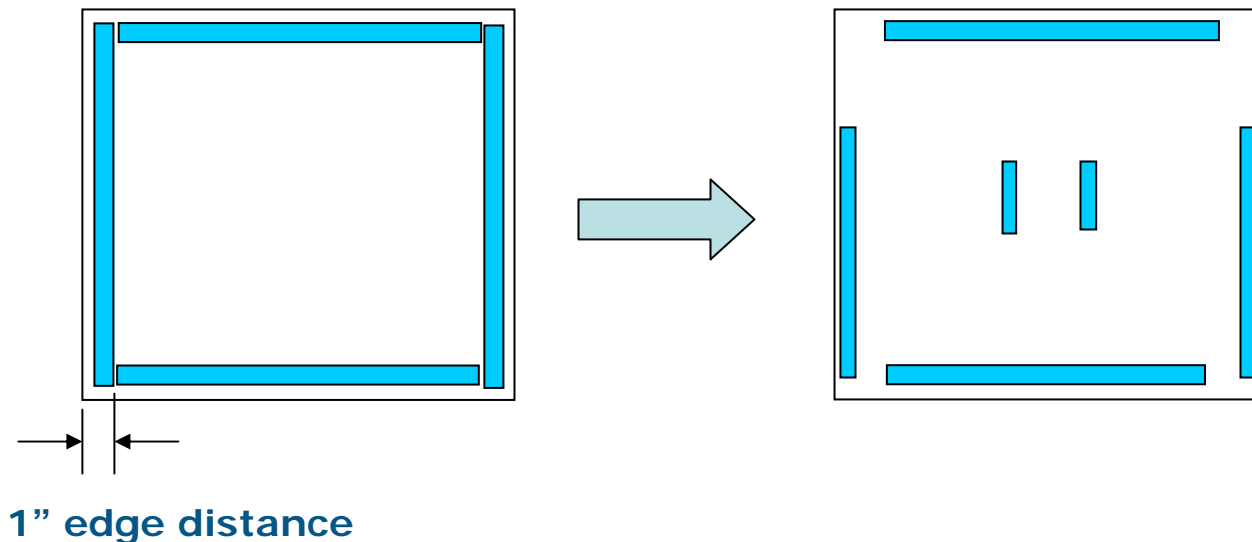
- EASA has developed a criteria to determine when the covering can be considered "*affixed around the edges*" of the supporting panel and therefore is not required to be tested together with the supporting panel.
  - If glue is applied within 1 inch from the edge of a covering, the panel shall be tested without the covering.
  - If glue is applied in locations other than within 1 inch from the edge of the covering, the panel may be tested without the covering if the total amount of glue used is equivalent to the amount that would be applied only around the edges.



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## Coverings 3/3

### Equivalent area example



EASA considers that the same criteria must be applied also to coverings attached by means of hook and loop, tape and other similar attachment methods.