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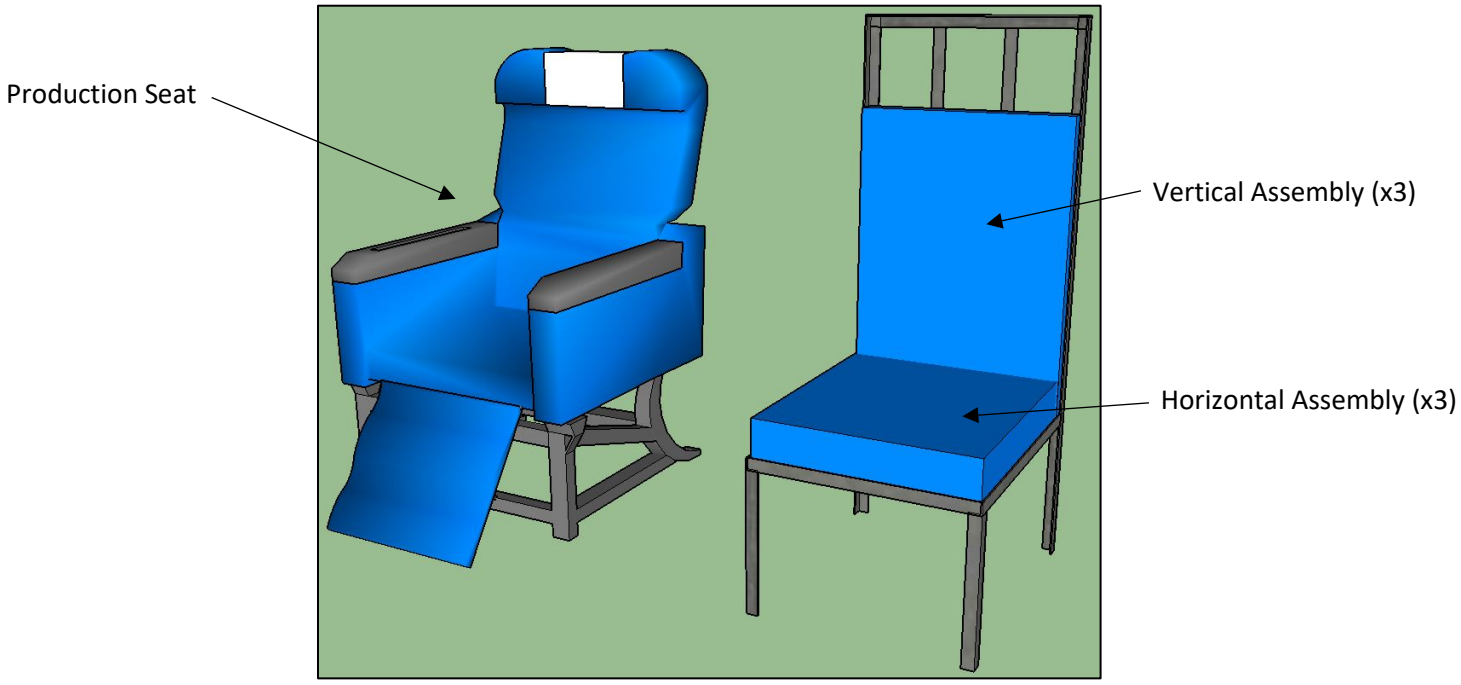
How to Build Seat Cushion Fireblock Test Samples

PURPOSE. The purpose of this Information Bulletin is to provide guidance on building seat cushion test samples for the Oil Burn for Seat Cushion (fireblock) test. The source of the rules below can be found in the following three places: 14 CFR 25, Appendix F, Part II; Advisory Circular AC 25.853-1; FAA Aircraft Fire Test Handbook, Chapter 7.

DEFINITIONS:

1. **Vertical Assembly:** The back (vertical) cushion. It represents either the production seat back, seat bottom, or both if they have the same construction. The dimensions must be 18” x 25” x 2” (± 0.125”) not including fabric closures (hook and loop, etc.) and seam overlap.
2. **Horizontal Assembly:** The bottom (horizontal) cushion. It represents either the production seat back, seat bottom, or both if they have the same construction. The dimensions must be 18” x 20” x 4” (± 0.125”) not including fabric closures (hook and loop, etc.) and seam overlap.
3. **Seat Test Sample:** Consists of one Vertical Assembly and one Horizontal Assembly. Both represent the same production cushion construction (i.e. both have identical construction and materials to represent the production seat bottom or seat back).
4. **Test Set:** Consists of three identical seat test samples.



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PROCEDURE:

Step 1: What components are used in the production seat? Each seat test sample must be built using the principal components (e.g. foam core, flotation material, fire blocking material, and dress covering).

Step 2: How is your production seat cushion assembled? Each seat test sample must be assembled using the same processes (representative seams and closures).

Step 3: Is a different material combination used for the production back cushion than for the bottom? If so, both material combinations must be tested as a complete test set (see Appendix A for examples).

Step 4: Do you have armrests, headrests, or footrests? If so, here are the guidelines:

> **Armrests:** Thin (outer-cover) padding does not require fireblock testing.
>
> **Headrests & Footrests:** If their construction is different from the bottom or back they will need to be tested as their own test set. In some cases, it may be reasonable to include the headrest as part of the seat back cushion.

Step 5: Are you using fire-blocking material? If so, here are the guidelines:

- The fire-blocking material must completely enclose the cushion foam core material.
- The method of fabricating the seams and closures must be the same as the production method.
- You want any possible weak points exposed to the burner flame. This may require configuring the test sample so that the seam is exposed to the test burner, even though it may not be positioned this way on a production cushion.
- **Special Case:** If more than one fire-blocking layer material is used on a production cushion, each blocking layer must be subjected to this test as a separate test set. In other words, you will build one test set using fire-blocking layer 1, build another test set using fire-blocking layer 2, etc.

Step 6: What foam(s) are you using in the production seat? The test samples must reflect the foam combination used. For example, if your production seat bottom uses 20% Foam "A" and 80% Foam "B", your test sample will also use 20% "A" and 80% "B". See the Appendix A for more examples.

Pro Tips

1. If different seats use similar foam combinations, you may be able to bracket the combinations instead of testing every combination. Let us know and we'll help you figure out the most efficient test method.
2. Low-density foams can be used to qualify foams of higher density if the chemical composition is the same.

Step 7: Let's talk dress covers.

1. **Are you using more than one type of dress cover in the production seat?** If yes, you can combine both in the seat test samples. See Appendix A for an example.
2. **Dress Cover Changes:** If you already tested a specific seat construction and the only change is the dress cover, you may not have to run another fireblock test. See Advisory Circular 25.853-1 for guidance, or contact us and we'll help you out.

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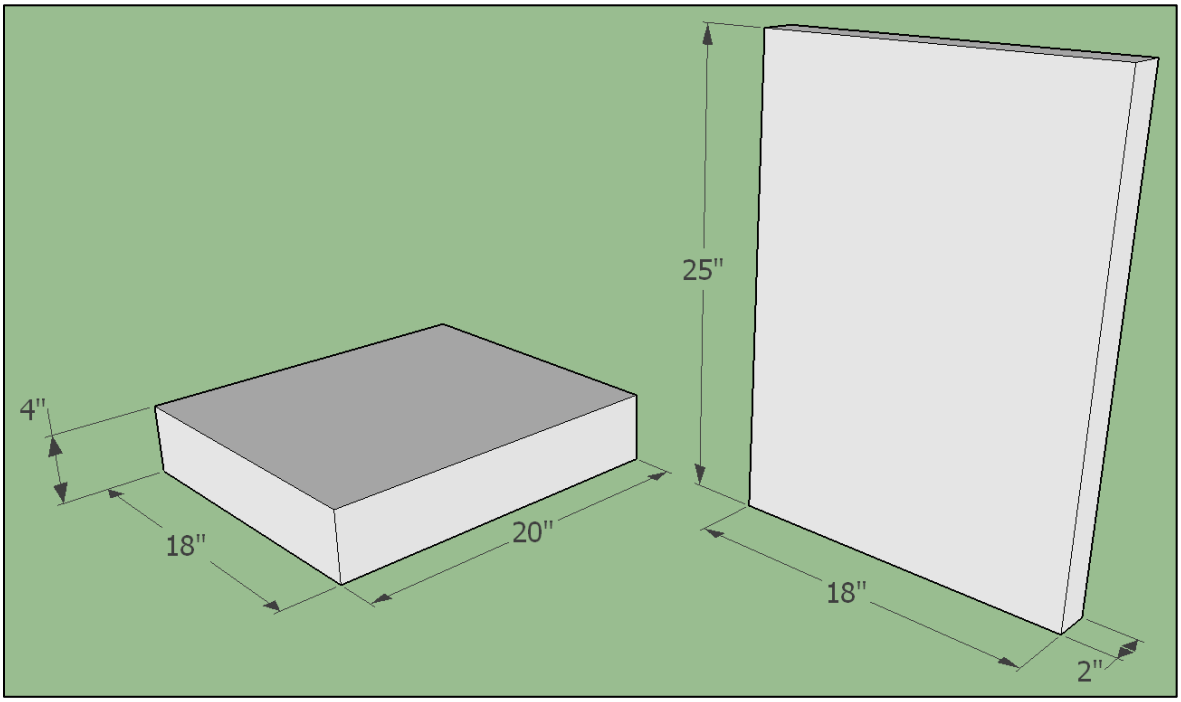
Step 8: Do you have decorative items on your production seat? Items like buttons, detail stitching, hand-hold straps, Velcro strips, or thin outer cover paddings (such as armrest covers) that do not penetrate the fire-blocking layer when fastened are not required to be on the test sample.

Step 9: Let's put it all together! Using this information, you can now build the test samples. Remember:

1. You'll need to build three (3) test samples for each type of combination.
2. Each test sample will be made up of a vertical and horizontal assembly.
3. The dimensions of the assemblies are the final assembled dimensions, including the fire-blocking layer and dress cover (so you may have to cut the foam smaller).
4. The dimensions don't include fabric closures (hook and loop, etc.) and seam overlaps; you can ignore these when measuring the assemblies.



Need more help?

Take a look at the Appendix A for more examples, and always feel free to contact us with questions!

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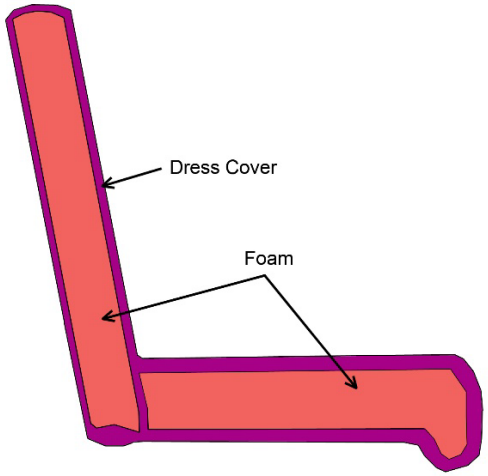
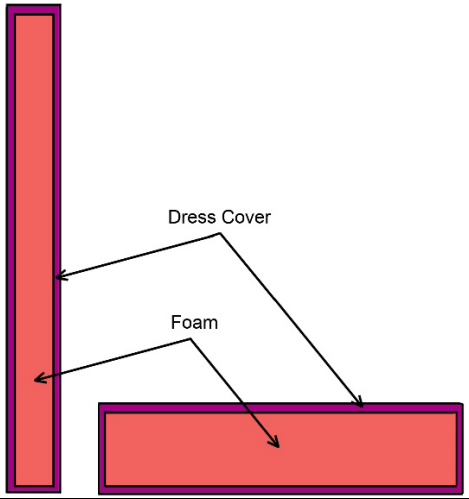
Appendix A: Examples

Example 1: Simple construction with same foam being used in bottom and back production cushions. One combination is required to qualify this seat.

Production Seat	
Seat Test Samples	**x3)** 

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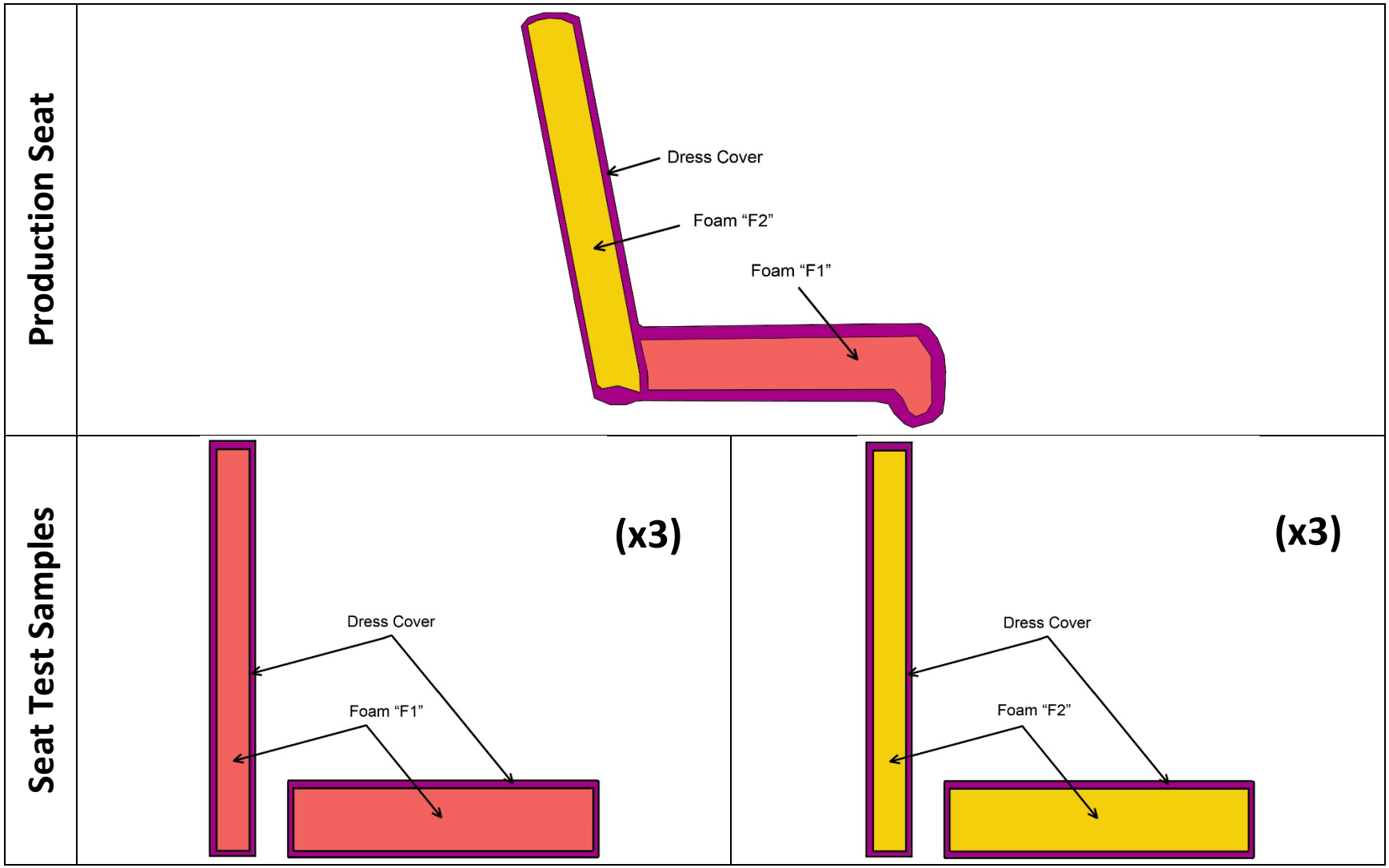
Example 2: Simple construction with different foam being used in bottom and back production cushions. Two combinations are required to qualify this seat.



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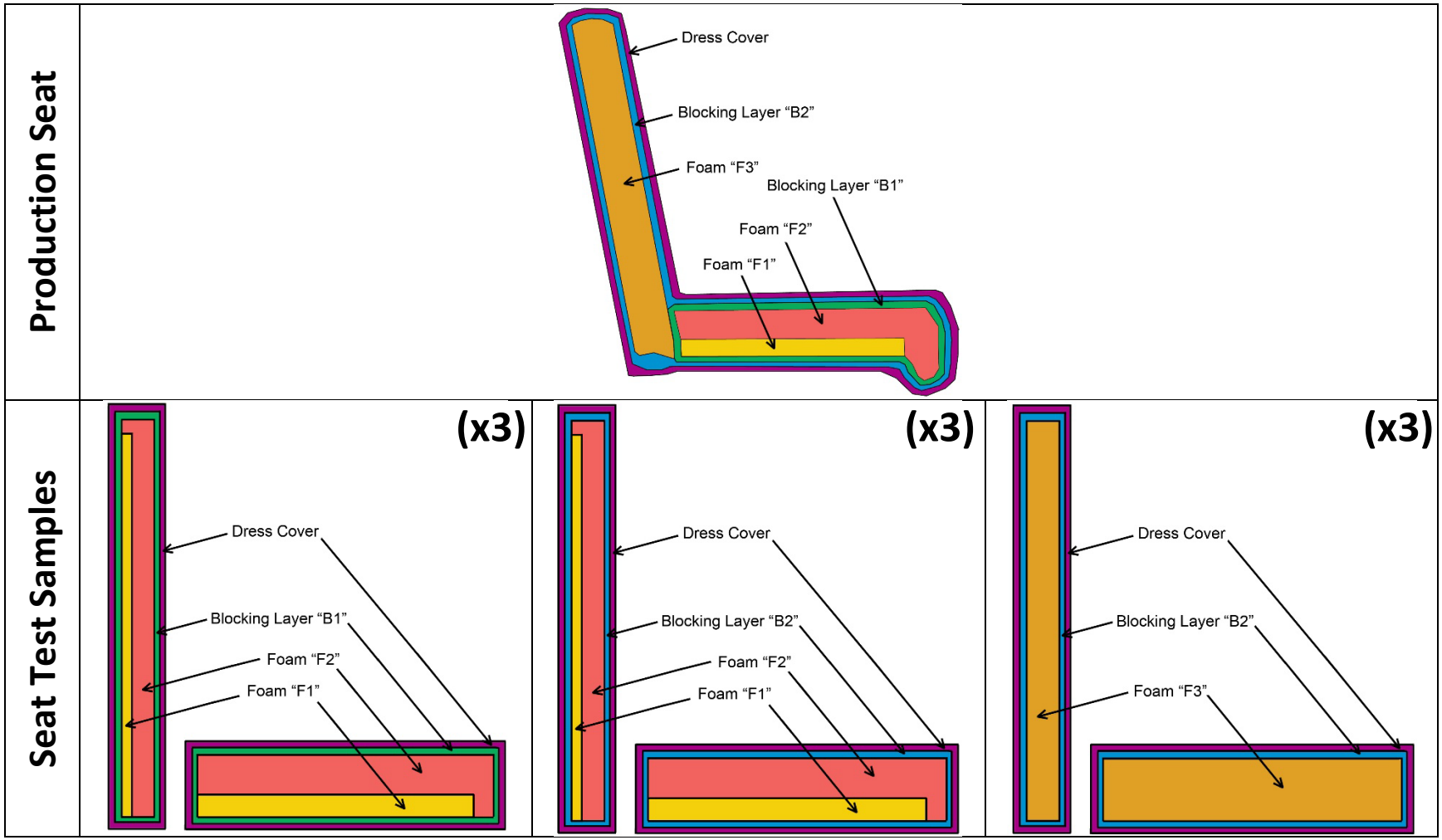
Example 3: Bottom cushion made up of two types of foam and covered with fireblock layer “B1”. Back cushion is made up of one type of foam. Fireblock layer “B2” covers the entire seat. Three combinations are required to qualify this seat.



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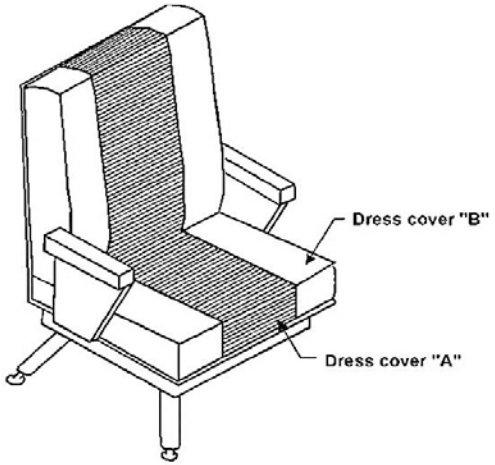
Example 4: Production seat using two dress cover materials. Both dress cover materials can be qualified in one combination.

Production Seat	
Seat Test Samples