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Proposal for Finding Compliance When Evaluating Gaps Between Panels

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Gaps Between Panels

For the purposes of this document Gaps between seat components are defined by the size of the gap and whether or not the subordinate panel is exposed to the Aircraft Cabin. There are three situations that cause a gap between two panels.

1) An overlap of two panels which are each exposed to the cabin
2) Two panels that are installed such that one is parallel or nearly parallel to the other and they are sized in such a way that their edges are flush with one another.
3) Two panels that are installed such that one completely shrouds the other from the cabin

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Gaps Between Panels

Panel spacing or “gap size” or defines whether a panel is exposed to the cabin.

GAP Size	Subordinate Panel Exposed	Method of Compliance
>1.0 in	Yes	Both Panels Must be tested to HRSC
0.25<Gap<1.0 in	No	Only the front Panel should be tested to HRSC
Gap<0.25in	No	If the exposed panel is compliant and resilient then there is no need to show compliance
	Yes	If the exposed panel is not resilient but is compliant then the subordinate panel should be compliant independently or the two panels must be tested as a single unit in contact with each other.

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Resilient Panel

- **A panel material is resilient if during a post crash event it is unlikely deteriorate and expose underlying materials; thereby preventing them from affecting the likelihood of a flashover event. A resilient panel design must be itself compliant to 14 CFR 25 Appendix F Parts IV and V and fit one of the following:**
  - Finished or unfinished metallic construction (less than 10% Magnesium)
  - Glass or carbon fiber composite (Multi-ply construction or a sandwich panel with Honeycomb or foam core)
  - Thermoplastic / Thermoset or similar construction shown by test to be “Resilient”

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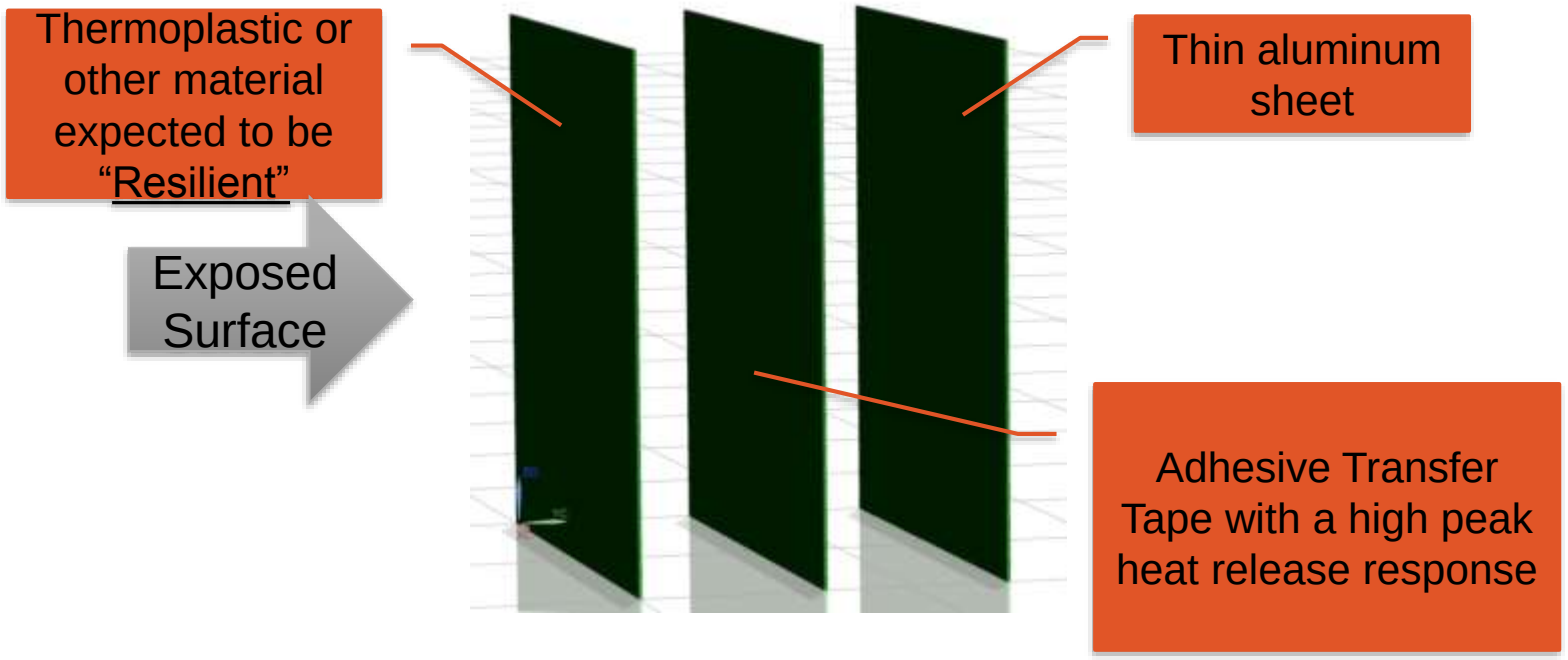
Resilient Material Test for Thermoplastics

Test Method to Show Resilience

- **A material may be shown to be resilient by meeting the OSU heat release requirements evaluated per the test configuration shown below**



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Test Recommendations

- **The covering material should be equivalent to the proposed panel thickness**
- **The aluminum sheet should be no greater than 1.5 mm in thickness Aluminum Grade 6061 is recommended**
- **For the test to properly demonstrate resiliency the underlying adhesive must be of a type that provides a high heat release when exposed to the OSU test. The adhesive tape should have the following OSU performance attached to an aluminum substrate**
  - It should have a peak Heat Release of at least 90 KW/m^2
  - It should ignite quickly, the time to peak should be less than 60 sec
  - It should have a time under peak of at least 30 seconds
  - A recommended tape is 3M 9473 which is a .010 in (.25 mm) thick adhesive transfer tape

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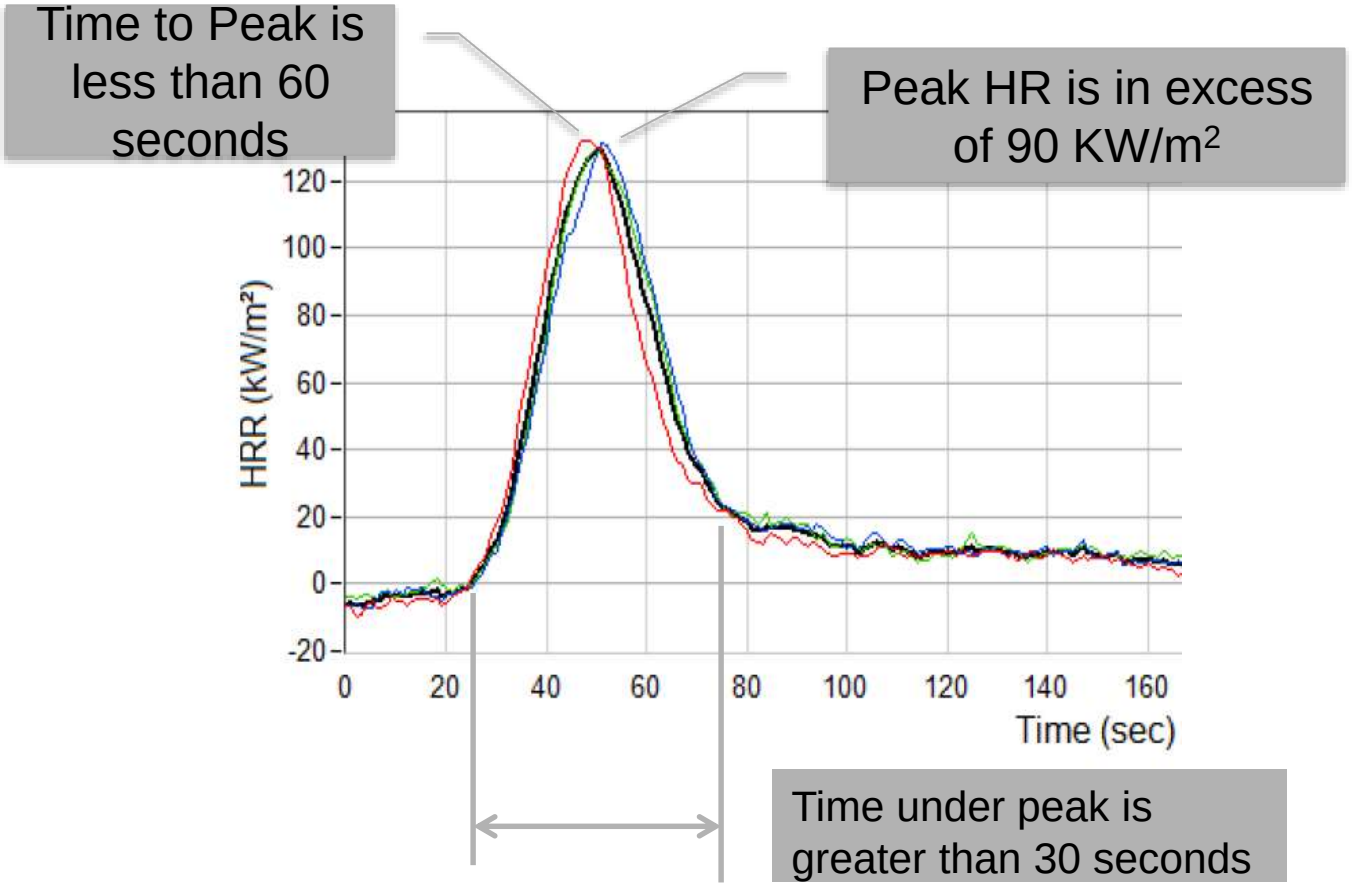
Tape Performance Parameters (3M 9473 Example)



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“Resilience Test” Guidelines

- The tests should be run according to the Guidelines in Chapter 5 of the Aircraft Materials Fire Test Handbook
- The test to show resilience is a separate test than those used to demonstrate compliance to Appendix F Parts IV and V
- The test to show that a thermoplastic is “Resilient” should be conducted with a test article that is designed as shown in the previous slides
- If the heat release test is passing for the construction, the thermoplastic material at the prescribed thickness is considered “Resilient” for purposes of a “Gap Analysis”
- For a given thermoplastic material, the color and texture do not affect “Resilience;” therefore, only a single test set per material brand/grade would be needed
- If the material is coated with paint or a laminate film, the test results of the base thermoplastic will be acceptable to show resilience. A test of the coated panel will have to be completed to demonstrate Heat Release compliance

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Resilient Material Test for Thermoplastics

“Resilience Test” Data Presentation

- The data necessary to show resilience should have
  - OSU test results showing the performance of the adhesive transfer tape used on Aluminum
    - This test should fail with a Average Peak Heat release of >90KW/m^2
  - OSU test results of the Resilient Panel configuration to be qualified
    - This test should pass with an average Peak Heat release of <65KW/m^2