

The Development of a Revised Flammability Test Method for Evacuation Slide Materials

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The current laboratory-scale flammability test for evacuation slide materials uses a Gardon-style calorimeter to calibrate the radiant heat furnace used to expose sample materials. The radiant heat furnace is adjusted to produce an incident heat flux of 1.5 Btu/ft²sec on the test specimen as indicated in Technical Order (TSO C69A). This current method had several issues:

- Different manufacturers calibrate transducers differently resulting in different calibration data
- Dust on the surface of the calorimeter may cause an improper heat flux reading
- Continuous measurement of the furnace output is not possible during the test
- The use of the heat flux transducer is time consuming (requires long time duration for the transducer to reach steady state)
- A heat flux transducer is required to be recalibrated every year due to the aging of the black velvet paint on the surface of the device

A revised test method was developed to replace the current test method. The revised test method measures the power input of the radiant heat furnace to ensure proper exposure of the test samples, instead of the radiant heat flux of the calorimeter. The advantages of controlling the power input for this flammability test are:

- The AC voltage and electrical current of the furnace are continuously measured, recorded and controlled using a computerized data system
- The electrical power input (voltage x current) can be calculated continuously
- The electrical power can be observed on the monitor and can be adjusted during the test
- There is no need to recalibrate the radiant heat furnace

The proposed power requirements is 425 to 435 Watts, which provides a radiant heat flux of 1.5 Btu/ft²sec to the test specimen at 2 inches in front of the furnace. Comparison tests of various evacuation slide materials using the new test method correlate to those tested using the current test method.