

FAR 25.853a & FAR 25.853d

For information applicable to KYDEX® FST please refer to 300 series technical briefs.

TB - 111-B

FAR 25.853a:

FAR 25.853a is a vertical Bunsen burner test designed by the FAA (Federal Aviation Administration) for cabin and cargo compartment materials. The test method is intended for use in determining the resistance of materials to flame when tested according to the 60-sec (i) and 12-sec (ii) vertical Bunsen burner tests. KYDEX® thermoplastic sheet products undergo this test to determine suitability for aircraft interior parts including but not limited to food trays and seating applications.

In this test a specimen is held in a vertical position by a device inside a cabinet and a Bunsen burner (31.80mm (1.500") flame) is placed beneath it for a given period of time (60 or 12 seconds accordingly). After the given period of time has elapsed, the burner is removed and the specimen is observed. Ignition time, flame time, drip flame time, and burn length are all recorded at the end of the test. The following are descriptions of things recorded during the tests:

Ignition Time	Length of time burner flame is applied to specimen
Flame Time	Time in seconds that the specimen continues to flame after burner flame is removed
Drip Flame Time	Time in seconds that any flaming material continues to flame after falling from specimen
Burn Length	Distance from original specimen's edge to farthest evidence of damage to specimen

The following are requirements for passing the FAR 25.853a test.

Test	Flame Time (sec)	Average Drip Extinguishing Time (sec.)	Average burn length
(i) 60 sec	< 15	< 3	152.40mm (6")
(ii) 12 sec	< 15	< 5	203.20mm (8")

Many KYDEX® sheet products meet the requirements set forth by the FAA. KYDEX® T, KYDEX® 100, KYDEX® 1900, KYDEX® 5555, KYDEX® 6185, KYDEX® 6200, KYDEX® 6565, and KYDEX 6565(d)® are specifically formulated to be used in aircraft and mass transit vehicles and meet the FAA requirements for this test at 0.71mm (0.028") and above.

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FAR 25.853a & FAR 25.853d

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FAR 25.853d:

FAR 25.853d is comprised of two separate tests; OSU Rate of Heat Release and Specific Optical Density of Smoke Generated by Solid Materials. These two tests help to determine the acceptability of the materials to be used in the interiors of aircrafts. More specifically, the OSU rate of heat release theoretically attempts to limit the possibility that certain interior materials with large outer surface areas will flashover, become rapidly involved in a fire, or readily contribute to an existing fire in a crash situation. By testing the materials such contributions to existing fires may be avoided.

The smoke density test, also known as the ASTM F-814 (now retired) but closely follows ASTM E-662, determines the smoke generation of a burning material to help improve egress capability after a fire. Results from the smoke density test are expressed in terms of specific optical density (Ds). Optical density (Ds) readings are taken at 1.5 minutes into the test and at 4 minutes.

The rate of heat release (OSU) is a measurement of the rate at which a burning item releases heat, using the principle of oxygen consumption (calorimetry), which is a critical parameter in fire protection engineering. (The test method for using the OSU calorimeter is published under ASTM E-906, and is a small scale component test). The heat release rate can be used in the characterization of the hazard represented by a given fuel package. Heat release rate can provide information on fire size and fire growth rate. This method tests materials and products under a constant, imposed, external heat flux.

Passing Criteria:

Total Heat Release w/in First 2 Minutes	<= 65 kW * minutes per square meter
Peak Heat Release Rate:	<= 65 kW per square meter
4.0 Minute Smoke Density (Ds):	<= 200

KYDEX® 5555, KYDEX® 6565, and KYDEX 6565(d)® meet FAR 25.853d

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