

FLAMMABILITY OF POLYMERIC INTERIOR MATERIALS—HORIZONTAL TEST METHOD

Foreword—This reaffirmed document has been changed only to reflect the new SAE Technical Standards Board format.

1. **Scope**—This SAE Standard pertains to automotive vehicles and off-road, self-propelled work machines used in construction, general purpose industrial, agriculture, forestry, and specialized mining machinery.

1.1 **Purpose**—This test method is intended for burning rate measurement of polymeric materials used in the operator and passenger compartments as specified by the applicable standard. SAE J369 is technically equivalent to ISO 3795.

2. **References**

2.1 **Applicable Publication**—The following publication forms a part of this specification to the extent specified herein.

2.1.1 ISO PUBLICATION—Available from ANSI, 11 West 42nd Street, New York, NY 10036-8002.

ISO 3795—Road vehicles, and tractors and machinery for agriculture and forestry—Determination of burning behaviour of interior materials

3. **Definitions**

3.1 **Does Not Ignite (DNI)**—The material does not support the combustion during or following the 15 s ignition period and does not transmit a flame front across either surface to the first scribed line. (No calculation is required.)

Report the results as: DNI.

3.2 **Self-extinguishing (SE)**—The material ignites on either surface, but the flame extinguishes itself before reaching the first scribed line. (No calculation is required.)

Report the results as: SE.

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- 3.3 Self-Extinguishing/No Burn Rate (SE/NBR)**—The material stops burning before it has burned for 60 s from the start of timing, and has not burned more than 50.8 mm (2 in.) from the point where the timing was started. (No calculation is required.)

Report the results as: SE/NBR.

- 3.4 Self-Extinguishing With A Burn Rate In Millimeters (Inches)/Minute (SE/B)**—When the leading flame front on either surface progresses beyond the first scribed line, but extinguishes itself before reaching the second scribed line, time and measure its progress to the furthest point where the burning stops and calculate and report the burn rate only if the burned distance exceeds 50.8 mm (2 in) or the burn time is 60 s or greater.

Report the results as: SE/B. Calculate burn rate.

- 3.5 Burn Rate In Millimeters (Inches)/Minute (B)**—The material burns the full 254 mm (10 in).

Report the results as: B. Calculate burn rate.

- 3.6 Rapid Burning (RB)**—The material transmits a flame across either surface more than 50.8 mm (2 in) beyond the first scribed line at a rate too fast to measure accurately; therefore, no calculation is required. Examples of the materials in this category are extremely thin films that burn rapidly, or napped surfaces that "flash."

Report the results as: RB.

4. Apparatus Required

- 4.1 Burner**—A Tirrill, Bunsen, or equivalent burner with a gas flow regulating valve and 9.53 mm (0.375 in) inside diameter tube, so positioned in the cabinet that the center of the end of the specimen shall be directly above the tip of the flame when the specimen is in place.

- 4.2 Burner Fuel**—The gas supplied to the burner shall have a flame temperature equivalent to that of natural gas. Recommended 3.36×10^7 to 4.13×10^7 J/m³ (900 to 1100 Btu/ft³), if so required.

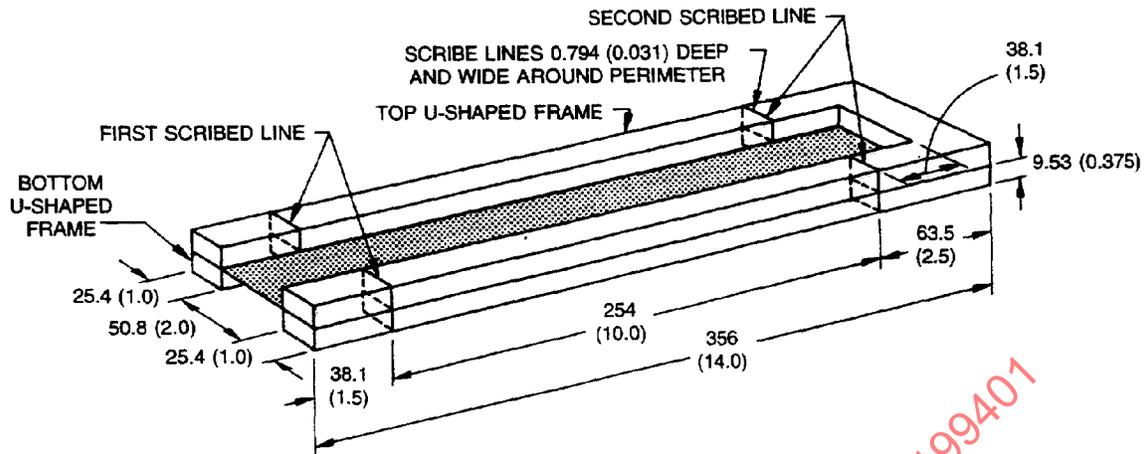
- 4.3 Specimen Holder**—Consisting of two identical U-shaped metal frames made from chrome or nickel-plated steel, or other metal that will not corrode.

The dimensions for these frames are shown in Figure 1. Lines shall be engraved or scribed on both surfaces of each frame located as shown in Figure 1.

- 4.4 Specimen Holder Support**—The specimen holder shall be supported horizontally so that the top of the burner is 19.1 mm (0.75 in) below the top surface of the lower specimen frame.

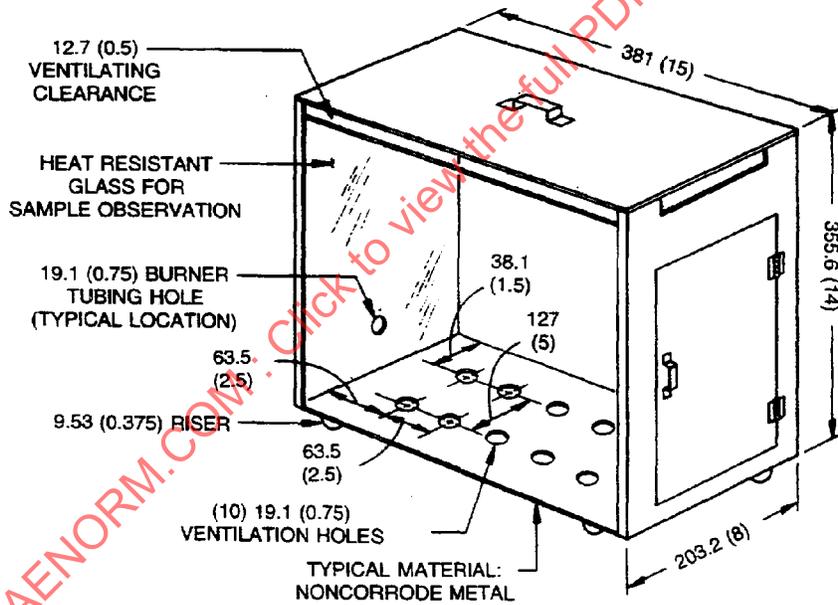
- 4.5 Metal Cabinet**—The cabinet (Figure 2) for protecting the specimen from drafts shall be fabricated from noncorroding metal and shall be 381 mm (15 in) long, 203 mm (8 in) wide, and 356 mm (14 in) high. It shall have a removable top and a glass observation window in front. For ventilation, the base shall have five 19.1 mm (0.75 in) diameter holes equally spaced along each side of the cabinet. In addition, there shall be a 12.7 mm (0.50 in) ventilating clearance running around the perimeter of the cabinet just below the top. At one end of the cabinet there shall be a door to permit insertion of the specimen holder and the specimen. A small hole may be drilled in the cabinet to accommodate the tubing that connects the gas line to the burner. The cabinet shall have 9.53 mm (0.375 in) risers to permit the circulation of air.

- 4.6 Combing Device**—A comb 102 mm (4 in) wide with 7 to 8 smooth round teeth per 25.4 mm (1 in).



DIMENSIONS ARE mm (in) MATERIAL: STAINLESS STEEL

FIGURE 1—SPECIMEN HOLDER, CONSISTING OF TWO IDENTICAL U-SHAPED FRAMES



DIMENSIONS ARE mm (in)

FIGURE 2—HORIZONTAL FLAMMABILITY CABINET

4.7 **Timing Device**—A stop watch that will indicate time to 0.1 of a second.

5. **Test Specimen Size**—In all instances, the largest possible specimen size is to be cut from the material up to the standard specimen size of 102 mm (4 in) x 356 mm (14 in) x thickness. The maximum thickness of any specimen shall be 12.7 mm (0.50 in). If any material to be tested exceeds this, it shall be cut down to a thickness of 12.7 mm (0.50 in) and shall include the primary surface of the part.

Where the maximum available width of the specimen is 50.8 mm (2 in) or less so that the sides of the specimen cannot be held in the two matching U-shaped frames, it is to be supported by the use of 0.254 mm (0.010 in) wires of heat-resistant composition spanning the top surface of the bottom U-shaped frame at 25.4 mm (1 in) intervals, as shown in Figure 3. The U-shaped wire frame shall also be used for a specimen that softens and bends at the flaming end.

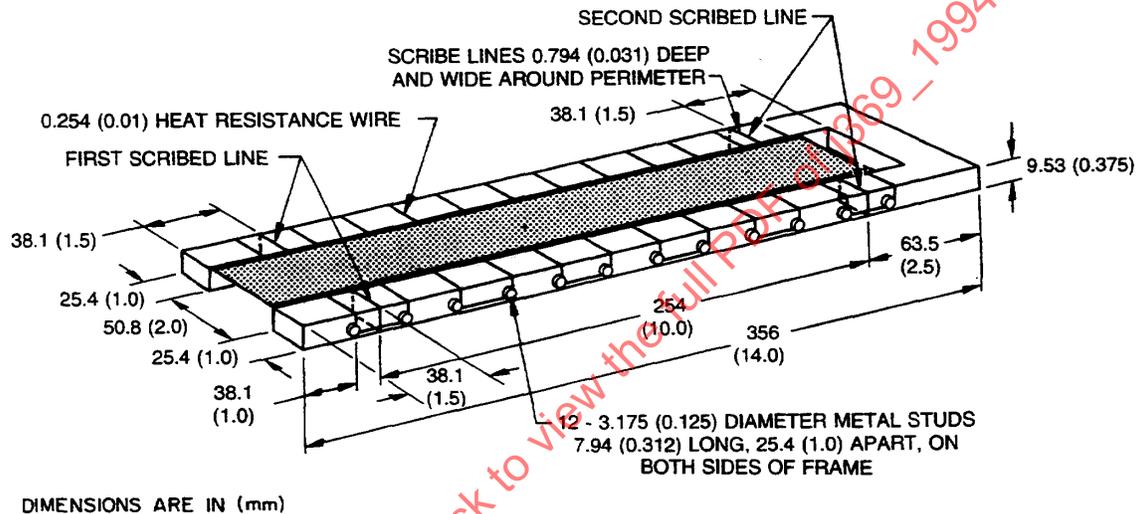


FIGURE 3—BOTTOM U-SHAPED WIRE FRAME USED FOR SPECIMENS THAT ARE 50.8 mm (2 in) OR LESS IN WIDTH OR THAT BURN NONUNIFORMLY USED IN CONJUNCTION WITH EITHER FRAME SHOWN IN FIGURE 1

5.1 **Selection and Direction**—Shall be as specified in the applicable standard.

5.2 **Surface Preparation**—When materials to be tested contain either a napped or a tufted-type surface, this test specimen shall be placed on a hard, flat surface and combed twice against the nap prior to testing.

6. **Test Procedure**

6.1 Prior to testing, each specimen is conditioned for 24 h at a temperature of 21.1 °C (70 °F) and 50% relative humidity or as otherwise specified.

6.2 For convenience, the samples may be stored up to 1 h in closed polyethylene bags after conditioning and prior to testing.

6.3 The tests should be conducted with the metal cabinet in a draft-free fume hood to prevent fumes from spreading throughout the room.

6.4 Close the air intake ports on the burner and adjust the gas flow to produce a flame 38.1 mm (1.5 in) in height.