

Sec. 25.853

Compartment interiors.

Materials (including finishes or decorative surfaces applied to the materials) used in each compartment occupied by the crew or passengers must meet the following test criteria as applicable:

(a) Interior ceiling panels, interior wall panels, partitions, galley structure, large cabinet walls, structural flooring, and materials used in the construction of stowage compartments (other than underseat stowage compartments and compartments for stowing small items such as magazines and maps) must be self-extinguishing when tested vertically in accordance with the applicable portions of Appendix F of this Part, or other approved equivalent methods. The average burn length may not exceed six inches and the average flame time after removal of the flame source may not exceed 15 seconds. Drippings from the test specimen may not continue to flame for more than an average of three seconds after falling.

[(b) Floor covering, textiles (including draperies and upholstery), seat cushions, padding, decorative and non-decorative coated fabrics, leather, trays and galley furnishings, electrical conduit, thermal and acoustical insulation and insulation covering, air ducting, joint and edge covering, liners of Class B and E cargo or baggage compartments, floor panels of C or D cargo and baggage compartments, insulation blankets, cargo covers, and transparencies, molded and thermoformed parts, air ducting joints, and trim strips (decorative and chafing), that are constructed of materials not covered in paragraph (b-2) of this section, must be self extinguishing when tested vertically in accordance with the applicable portions of Part I of Appendix F of this Part, or other approved equivalent methods. The average burn length may not exceed 8 inches, and the average flame time after removal of the flame source may not exceed 15 seconds. Drippings from the test specimen may not continue to flame for more than an average of 5 seconds after falling.]

(b-1) Motion picture film must be safety film meeting the Standard Specifications for Safety Photographic Film (PH1.25) (available from the American National Standards Institute, 1430 Broadway, New York, N.Y. 10018), or an FAA approved equivalent. If the film travels through ducts, the ducts must meet the requirements of paragraph (b) of this section.

(b-2) Acrylic windows and signs, parts constructed in whole or in part of elastomeric materials, edge lighted instrument assemblies consisting of two or more instruments in a common housing, seat belts, shoulder harness, and cargo and baggage tiedown equipment, including containers, bins, pallets, etc., used in passenger or crew compartments may not have an average burn rate greater than 2.5 inches per minute when tested horizontally in accordance with the applicable portions of Appendix F of this Part, or other approved equivalent methods.

(b-3) Except for electrical wire and cable insulation, and for small parts (such as knobs, handles, rollers, fasteners, clips, grommets, rub strips, pulleys, and small electrical parts) that the Administrator finds would not contribute significantly to the propagation of a fire, materials in items not specified in paragraphs (a), (b), (b-1), or (b-2) of this section may not have a burn rate greater than 4.0 inches per minute when tested horizontally in accordance with the applicable portions of Appendix F of this Part or other approved equivalent methods.

(c) In addition to meeting the requirements of paragraph (b), seat cushions, except those on flight crewmember seats, must meet the test requirements of Part II of Appendix F of this Part, or equivalent.

(d) If smoking is to be prohibited, there must be placard so stating, and if smoking is to be allowed--

(1) There must be an adequate number of self-contained, removable ashtrays; and

(2) Where the crew compartment is separated from the passenger compartment, there must be at least one sign meeting the "No Smoking" sign requirements of Sec. 25.791 notifying all passengers when smoking is prohibited.

(e) Each disposal receptacle for towels, paper, or waste must be fully enclosed and constructed of at least fire restraint materials, and must contain fires likely to occur in it under normal use. The ability of the disposal receptacle to contain those fires under all probable conditions of wear, misalignment, and ventilation expected in service must be demonstrated by test. A placard containing the legible words "No Cigarette Disposal" must be located on or near each disposal receptacle door.

(f) Lavatories must have "No Smoking" or "No Smoking in Lavatory" placards located conspicuously on each side of the entry door, and self-contained removable ashtrays located conspicuously on or near the entry side of each lavatory door, except that one ashtray may serve more than one lavatory door if the ashtray can be seen readily from the cabin side of each lavatory door served. The placards must have red letters at least one-half inch high on a white background of at least one inch high. (A "No Smoking" symbol may be included on the placard.)

Amdt. 25-60, Eff. 6/16/86

Part 25 AIRWORTHINESS STANDARDS: TRANSPORT CATEGORY AIRPLANES  
Appendix F

Sec. F25.3

[Appendix F--Part III--Test Method to Determine Flame Penetration Resistance of Cargo Compartment Liners.]

[(a) *Criteria for Acceptance.*

(1) At least three specimens of cargo compartment sidewall or ceiling liner panels must be tested.

(2) Each specimen tested must simulate the cargo compartment sidewall or ceiling liner panel, including any design features, such as joints, lamp assemblies, etc., the failure of which would affect the capability of the liner to safely contain a fire.

(3) There must be no flame penetration of any specimen within 5 minutes after application of the flame source, and the peak temperature measured at 4 inches above the upper surface of the horizontal test sample must not exceed 400° F.

(b) *Summary of Method.* This method provides a laboratory test procedure for measuring the capability of cargo compartment lining materials to resist flame penetration with a 2 gallon per hour (GPH) #2 Grade kerosene or equivalent burner fire source. Ceiling and sidewall liner panels may be tested individually provided a baffle is used to simulate the missing panel. Any specimen that passes the test as a ceiling liner panel may be used as a sidewall liner panel.

(c) *Test Specimens.*

(1) The specimen to be tested must measure  $16 \pm \frac{1}{8}$  inches ( $406 \pm 3$  mm) by  $24 \pm \frac{1}{8}$  inches ( $610 \pm$  mm).

(2) The specimens must be conditioned at 70° F.  $\pm$  5° F. (21°C.  $\pm$  2°C.) and 55%  $\pm$  5% humidity for at least 24 hours before testing.

(d) *Test Apparatus.* The arrangement of the test apparatus, which is shown in Figure 3 of Part II and Figure 1 through 3 of this Part of Appendix F, must include the components described in this section. Minor details of the apparatus may vary, depending on the model of the burner used.

(1) *Specimen Mounting Stand.* The mounting stand for the test specimens consists of steel angles as shown in Figure 1.

(2) *Test Burner.* The burner to be used in testing must--

(i) Be a modified gun type.

(ii) Use a suitable nozzle and maintain fuel pressure to yield a 2 GPH fuel flow. For example: an 80 degree nozzle nominally rated at 2.25 GPH and operated at 85 pounds per square inch (PSI) gage to deliver 2.03 GPH.

(iii) Have a 12 inch (305 mm) burner extension installed at the end of the draft tube with an opening 6 inches (152 mm) high and 11 inches (280 mm) wide as shown in Figure 3 of Part II of this Appendix.

(iv) Have a burner fuel pressure regulator that is adjusted to deliver a nominal 2.0 GPH of #2 Grade kerosene or equivalent.

Burner models which have been used successfully in testing are the Lenox Model OB-32, Carlin Model 200 CRD and park Model DPL. The basic burner is described in FAA Powerplant Engineering Report No. 3A, Standard Fire Test Apparatus and Procedures for Flexible Hose Assemblies, dated March 1978; however, the test setting specified in this Appendix differ in some instances from those specified in the report.

(3) *Calorimeter.*

(i) The calorimeter to be used in testing must be a total heat flux Foil Type Gardon Gage of an appropriate range (approximately 0 to 15.0 British thermal unit (BTU) per ft.<sup>2</sup> sec., 0-17.0 watts/cm<sup>2</sup>). The calorimeter must be mounted in a 6 inch by 12 inch (152 by 305 mm) by <sup>3</sup>/<sub>4</sub> inch (19 mm) thick insulating block which is attached to a steel angle bracket for placement in the test stand during burner calibration as shown in Figure 2 of the Part of this Appendix.

(ii) The insulating block must be monitored for deterioration and the mounting shimmed as necessary to ensure that the calorimeter face is parallel to the exit plane of the test burner cone.

(4) *Thermocouples.* The seven thermocouples to be used for testing must be <sup>1</sup>/<sub>16</sub> inch ceramic sheathed, type K, grounded thermocouples with a nominal 30 American wire gage (AWG) size conductor. The seven thermocouples must be attached to a steel angle bracket to form a thermocouple rake for placement in the stand during burner calibration as shown in Figure 3 of this Part of this Appendix.

(5) *Apparatus Arrangement.* The test burner must be mounted on a suitable stand to position the exit of the burner cone a distance of 8 inches from the ceiling liner panel and 2 inches from the sidewall liner panel. The burner stand should have the capability of allowing the burner to be swung away from the test specimen during warm-up periods.

(6) *Instrumentation.* A recording potentiometer or other suitable instrument with an appropriate range must be used to measure and record the outputs of the calorimeter and the thermocouples.

(7) *Timing Device.* A stopwatch or other device must be used to measure the time of flame application and the time of flame penetration, if it occurs.

(e) *Preparation of Apparatus.* Before calibration, all equipment must be turned on and allowed to stabilize, and the burner fuel flow must be adjusted as specified in paragraph (d)(2).

(f) *Calibration.* To ensure the proper thermal output of the burner the following test must be made:

(1) Remove the burner extension from the end of the draft tube. Turn on the blower portion of the burner without turning the fuel or igniters on. Measure the air velocity using a

hot wire anemometer in the center of the draft tube across the face of the opening. Adjust the damper such that the air velocity is in the range of 1550 to 1800 ft./min. If tabs are being used at the exit of the draft tube, they must be removed prior to this measurement. Reinstall the draft tube extension cone.

(2) Place the calorimeter on the test stand as shown in Figure 2 at a distance of 8 inches (203 mm) from the exit of the burner cone to simulate the position of the horizontal test specimen.

(3) Turn on the burner, allow it to run for 2 minutes for warm-up, and adjust the damper to produce a calorimeter reading of  $8.0 \pm 0.5$  BTU per ft.<sup>2</sup> sec. ( $9.1 \pm 0.6$  Watts/cm<sup>2</sup>).

(4) Replace the calorimeter with the thermocouples rake (see Figure 3).

(5) Turn on the burner and ensure that each of the seven thermocouples reads 1700°F.  $\pm$  100°F. (927°C.  $\pm$  38°C.) to ensure steady state conditions have been achieved. If the temperature is out of this range, repeat steps 2 through 5 until proper readings are obtained.

(6) Turn off the burner and remove the thermocouple rake.

(7) Repeat (1) to ensure that the burner is in the correct range.

(g) *Test Procedure.*

(1) Mount a thermocouple of the same type as that used for calibration at a distance of 4 inches (101 mm) above the horizontal (ceiling) test specimen. The thermocouple should be centered over the burner cone.

(2) Mount the test specimen on the test stand shown in Figure 1 in either the horizontal or vertical position. Mount the insulating material in the other position.

(3) Position the burner so that flame will not impinge on the specimen, turn the burner on, and allow it to run for 2 minutes. Rotate the burner to apply the flame to the specimen and simultaneously start the timing device.

(4) Expose the test specimen to the flame for 5 minutes and then turn off the burner. The test may be terminated earlier if flame penetration is observed.

(5) When testing ceiling liner panels, record the peak temperature measured 4 inches above the sample.

(6) Record the time at which flame penetration occurs if applicable.

(h) *Test Report.* The test report must include the following:

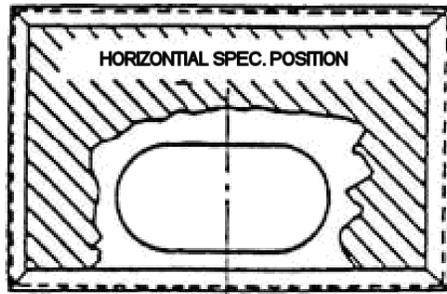
(1) A complete description of the materials tested including type, manufacturer, thickness, and other appropriate data.

(2) Observations of the behavior of the test specimens during flame exposure such as delamination, resin ignition, smoke, etc., including the time of such occurrence.

(3) The time at which flame penetration occurs, if applicable, for each of three specimens tested.

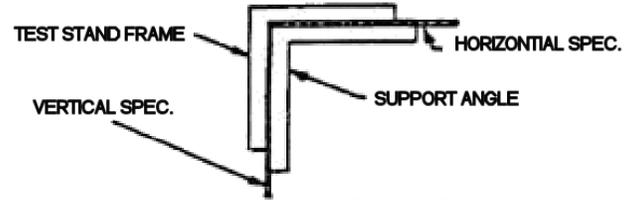
(4) Panel orientation (ceiling or sidewall.)

Figure 1. Test Apparatus for Horizontal and Vertical Mounting

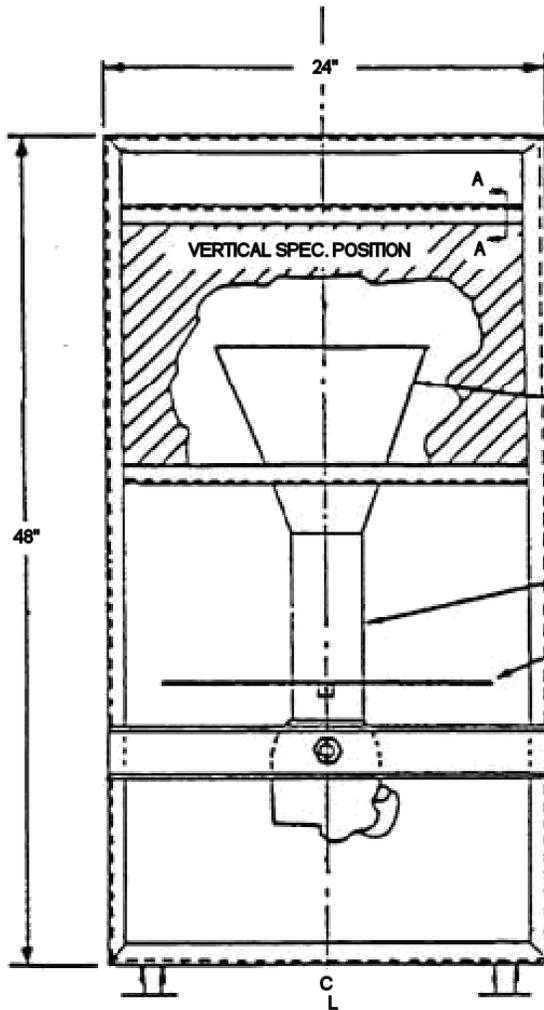


TOP VIEW

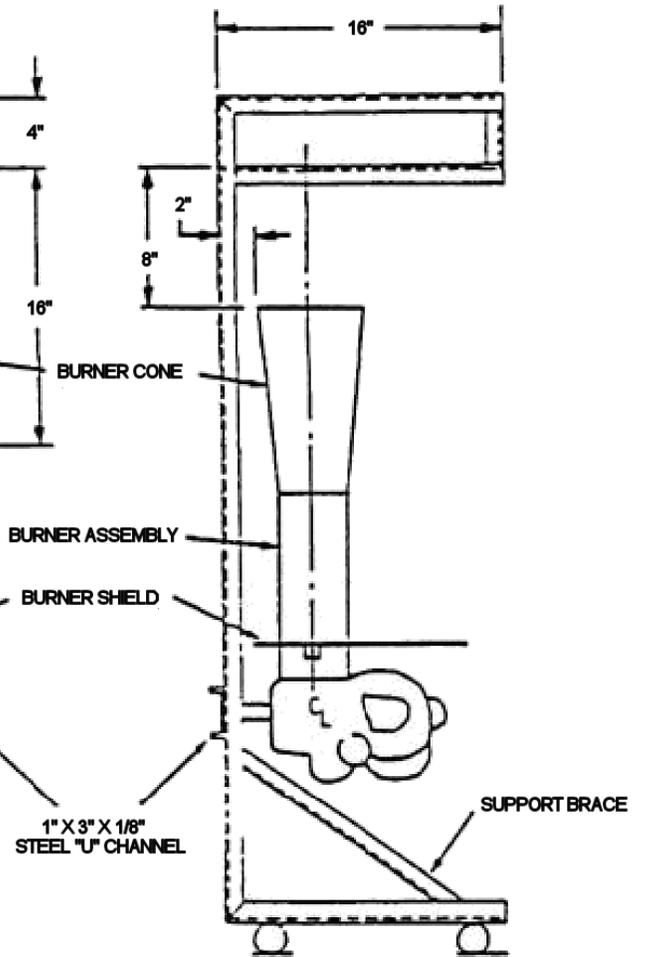
HORIZONTAL AND VERTICAL SPECIMENS ARE CLAMPED IN PLACE ON ALL EDGES BETWEEN ANGLES AS SHOWN IN VIEW A - A



VIEW A - A (Typical)



FRONT VIEW



SIDE VIEW

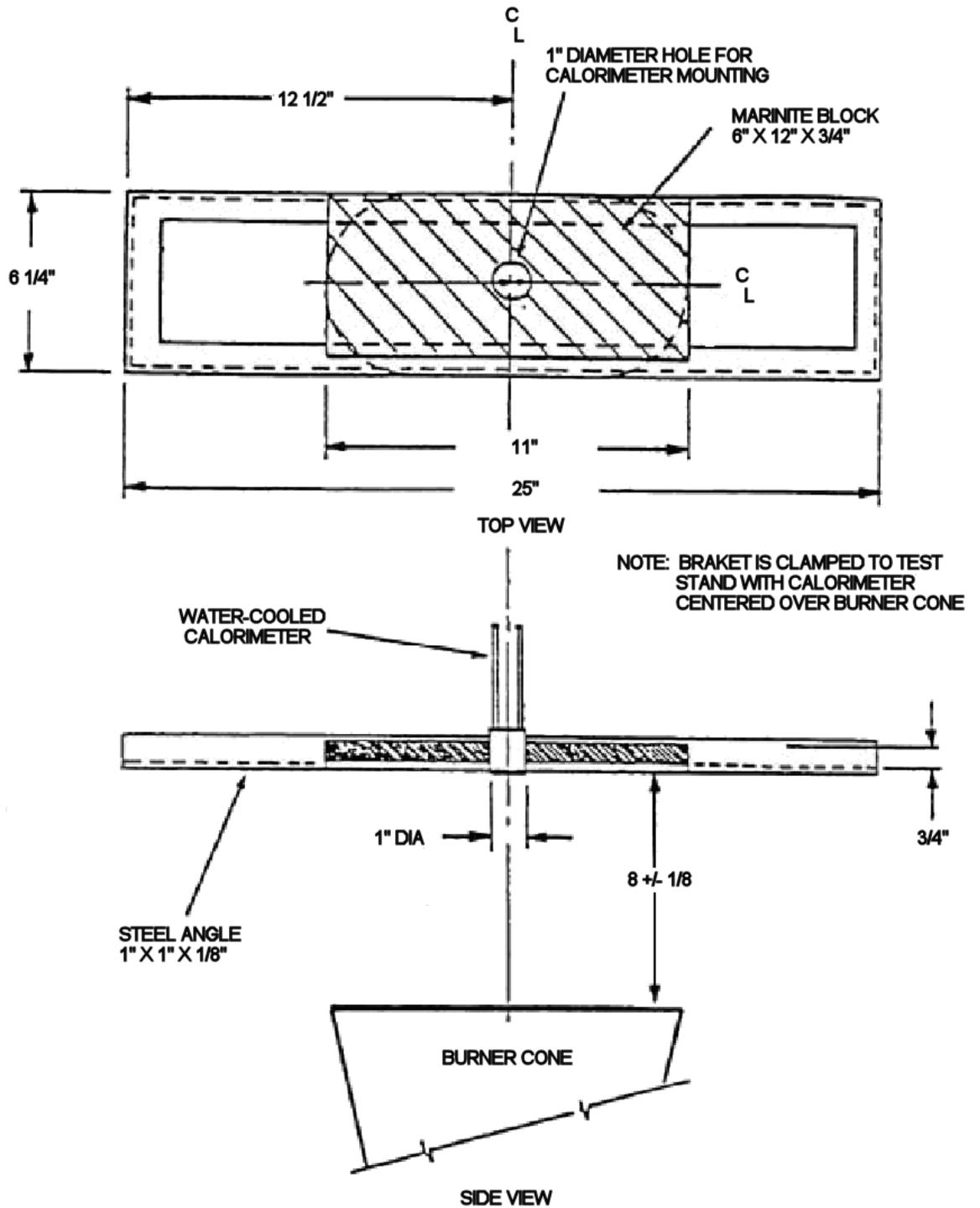


FIGURE 2. CALORIMETER BRACKET

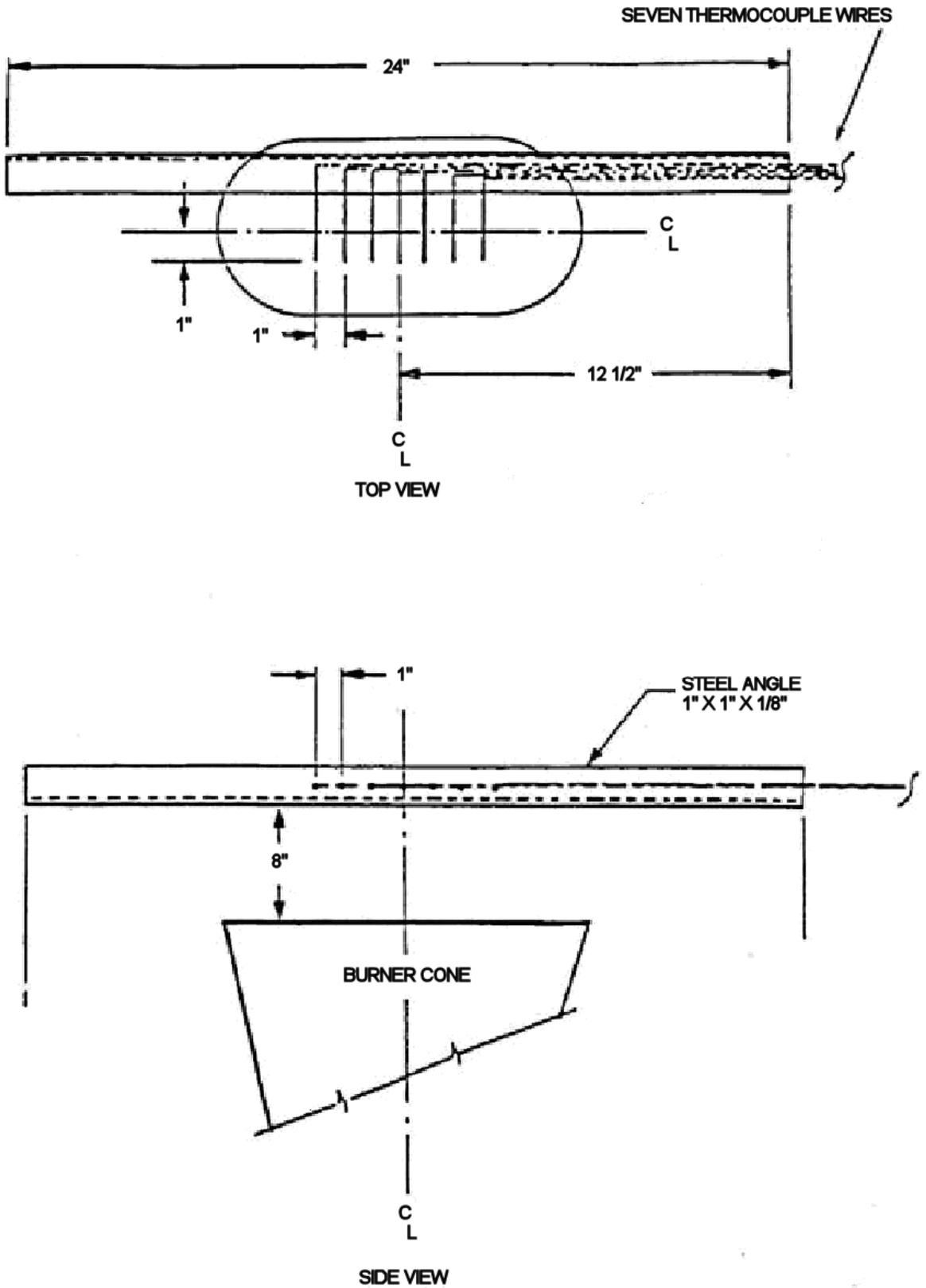


FIGURE 3. THERMOCOUPLE RAKE BRACKET

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