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AMERICAN SOCIETY FOR TESTING AND MATERIALS

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Standard Method of Test for SURFACE FLAMMABILITY OF MATERIALS USING A RADIANT HEAT ENERGY SOURCE[1]

This Standard is issued under the fixed designation E 162; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval.

1. Scope

1.1 This method, to be used for research and development purposes, covers the measurement of surface flammability of materials. It is not intended for use as a basis of ratings for building code purposes.

NOTE 1—The values stated in U.S. customary units are to be regarded as the standard.

2. Summary of Method

2.1 This method of measuring surface flammability of materials employs a radiant heat source consisting of a 12 by 18-in. (305 by 457 mm) panel in front of which an inclined 6 by 18-in. (152 by 457 mm) specimen of the material is placed. The orientation of the specimen is such that ignition is forced near its upper edge and the flame front progresses downward.

2.2 A factor derived from the rate of progress of the flame front (ignition properties) and another relating to the rate of heat liberation by the material under test are combined to provide a flame spread index. Provision is also made for measurement of the smoke evolved during tests.

3. Apparatus

3.1 The apparatus shall be essentially as shown in Figs. 1 and 2 and shall include the following:

3.1.1 *Radiant Panel with Air and Gas Supply*[2]—The radiant panel shall consist of a porous refractory material vertically mounted in a cast iron frame, exposing a radiating surface of 12 by 18 in. (305 by 457 mm) and shall be capable of operating at temperatures up to 1500 F (816 C). The panel shall be equipped (see Fig. 2) with a venturi-type aspirator for mixing gas and air at approximately atmospheric pressure; a centrifugal blower, or, equivalent, to provide 100 ft^3/min (47.2 liters/s) air at 2.8 in. (71 mm) of water; an air filter to prevent dust from obstructing the panel pores; a pressure regulator and a control and shut-off valve for the gas supply.

3.1.2 *Specimen Holder*—The specimen holder shall conform in shape and dimension to Fig. 3 and be constructed from heat-resistant chromium steel. Observation marks shall be filed on the surface of the specimen holder to correspond with 3-in. (76-mm) interval lines on the specimen.

3.1.3 *Framework for Support of the Specimen Holder*—The framework shall have two transverse rods of stainless steel, each ½-in. (12.7-mm) in diameter, with a stop to center the specimen holder directly in front of the radiant panel. The support and bracing members should be constructed from metal stock. Since the angle of the specimen and its position with respect to the panel are critical, the framework dimensions specifying these conditions shall be within ⅛ in. (3.2 mm) of the values given in Fig. 2.

3.1.4 *Pilot Burner*—The pilot burner shall be a short length of stainless steel tubing ⅛-in. (3.2-mm) inside diameter by 3/16-in. (4.8-

[1] This method is under the jurisdiction of ASTM Committee E-5 on Fire Tests of Materials and Construction.

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[2] The radiant panel 12 by 18 in. (305 by 457 mm), Type 1, surface combuster, and associated air and gas supply system, manufactured by Radiant Heating Ltd., Barnbury Park, London N. 1, England, and distributed through Standard Sales, Ltd., 74 Borough High St., London S.E. 1, has been found satisfactory for this purpose.

mm) outside diameter. The part of the burner that is exposed to radiant energy shall be protected with a porcelain tube 1 3/64-in. (5.16-mm) inside diameter by 3/32 in. (6.84-mm) outside diameter. The burner shall be mounted horizontally and at a slight angle to the intersection of the horizontal plane of the burner with the plane of the specimen. The burner shall also be capable of being swung out of position when not in use. The pilot shall provide a 2 to 3-in. (51 to 76-mm) flame of gas premixed with air in an aspirating type fitting. Acetylene has been found satisfactory for this purpose. The position of the burner tip is such that the flame will contact or be within ½ in. (12.7 mm) of contacting the top center area of the specimen.

3.1.5 *Stack*—The stack shall be made from 0.040-in. (1.0-mm) sheet steel with shape and dimensions as shown in Fig. 2. The position of the stack with respect to the specimen and radiant heat panel shall also comply with the requirements of Fig. 2.

3.1.6 *Thermocouples*—Eight thermocouples of equal resistance and connected in parallel shall be mounted in the stack and supported with porcelain insulators as indicated in Figs. 2 and 4. Each junction shall be formed by fusing the end of a twisted pair of chromel and alumel wires of 0.020-in. (0.508-mm) diameter.

3.1.7 *Automatic Potentiometer Recorder*—An automatic potentiometer in the range of 100 to 1000 F (38 to 538 C) shall be installed to record the temperature variation of the stack thermocouples as described in 3.1.6. The recorder should give a continuous record or shall print at time intervals of not more than 15 s.

3.1.8 *Smoke Sampling Device*—The tube and assembly parts of the smoke sampling device shall be as shown in Fig. 5.

3.1.8.1 *Glass Fiber Filter Paper*[3]—A single layer of glass fiber filter paper above the stack shall collect the smoke deposit (see Fig. 5).

3.1.8.2 *Aspirator and Flowmeter*—An aspirator, or pump, and a flowmeter capable of maintaining a constant air flow velocity equivalent to 40 ft/min (203 mm/s) of air at 70 F (21 C) at the face of the 7/8-in. (22.2-mm) diameter filter disk are required.

3.1.9 *Smoke Transmission Densitometer*—A photometer using an S-4 type photosensitive surface together with an incandescent light source shall be used for optical density measurements of the deposited smoke film over a density range of 0 to 4.5.

3.1.10 *Hood*—A hood with exhaust blower placed over the stack is required for standardization of the smoke measurement. The blower should produce a velocity of 100 ft (30.5 m)/min at the top of the stack with the radiant panel not operating, or approximately 250 ft (76.2 m)/min with the radiant panel at operating temperature. The velocity through the stack is not critical for flame-spread measurements provided a stack thermocouple temperature calibration is performed (see Appendix A1.3) for the established test conditions. The hood surfaces should clear the top and sides of the stack by a minimum of 10 in. (254 mm) and 7½ in. (191 mm) respectively.

3.1.11 *Radiation Pyrometer*—The radiation pyrometer for standardizing the thermal output of the panel shall be suitable for viewing a circular area 10 in. (254 mm) in diameter at a range of about 4 ft (1.2 m). It shall be calibrated over the operating black body temperature range in accordance with the procedure described in the Appendix.

3.1.12 *Portable Potentiometer*—The electrical output of the radiation pyrometer shall be monitored by means of a potentiometer provided with a millivolt range suitable for use with the radiation pyrometer described in 3.1.11.

3.1.13 *Timer*—The timer shall be calibrated to read to 0.01 min to record the time of events during the test.

4. Test Specimens

4.1 The test specimens shall be 6 by 18 in. (152 by 457 mm) by the sheet thickness.

4.2 *Application Tests*—Backing materials for the test shall be the same as that for the intended application.

4.3 For comparison tests, or where the intended application of a finish material is not specified, the finish material shall be prepared for test in accordance with 4.4 to 4.8.

4.4 Sheet materials that are opaque to in-

[3] Type 1106BH All Glass Filter Media, distributed by Mine Safety Appliances, 201 N. Braddock Avenue, Pittsburgh, Pa. 51208, has been found satisfactory for this purpose.

frared radiation and greater than 1/16-in. (1.6-mm) thickness are not applied to a base.

4.5 Opaque sheet materials up to 1/16-in. (1.6-mm) thickness, and liquid films such as paints, etc. intended for application to combustible base materials, shall be applied to 1/4-in. (6.4-mm) thick tempered hardboard using recommended application procedures. The hardboard shall have a mean flame-spread index of 130 to 160 based upon a minimum of four tests performed in accordance with this method.

4.6 Liquid films and other materials for application to a noncombustible base shall be applied to the smooth surface of 1/4-in. (6.4-mm) thick asbestos-cement board, using specified spreading rate requirements, or, in the absence of requirements, a minimum-coating thickness of 0.030 in. (0.76 mm).

4.7 Transparent or translucent sheet materials of any thickness are not applied to a base but shall be backed by a sheet of highly reflective aluminum foil.

4.8 Materials, including fabrics, not applied to a base but supported at one or more edges shall be mounted on a special backing of 1/2-in. (12.7-mm) thick asbestos millboard of which the surface opposite the test specimen is covered with a sheet of highly reflective aluminum foil. Asbestos millboard spacers 1/2 by 1/2 in. (12.7 by 12.7 mm) shall be used at the perimeter of the foil-covered face of the backing to separate the test material from the foil. Flexible materials shall be cut to 10 by 22-in. (254 by 559-mm) size, folded around the frame and fastened to the rear surface of the millboard with tension sufficient only to remove slack.

4.9 Finish materials, including sheet laminates, tiles, fabrics and others applied to a base material with adhesive as well as laminated materials not attached to a base shall be tested for possible increased flame spread or associated hazard due to delamination, cracking, peeling, or other separation of the finish material. An increase in flame spread may be caused by flaming on the reverse face of the test material, or by ignition of the adhesive or base material. Determination of the existence of such effects shall be made as follows:

4.9.1 One or more specimens of the sample material shall be tested as received in the manner prescribed herein for the flame spread determination of ordinary materials.

4.9.2 Materials which tend to delaminate or in any way separate from the specimen holder during the above test exposure shall be retested using one or more specimens in which the material is retained in position by a 6 by 18-in. (152 by 457-mm) sheet of 1-in. (25.4-mm) hexagonal wire mesh placed in the specimen holder and against the exposed face of the specimen.

4.9.3 Materials as described in this paragraph, and tested in accordance with 4.9.1 or 4.9.1 and 4.9.2 combined shall be further tested using one or more specimens. These specimens shall be prepared by scoring grooves of 1/16 in. (1.6 mm) max width in the finish material, making one longitudinal groove 1 in. (25.4 mm) from an edge, and five lateral grooves 4 in. (102 mm) apart and 1 in. (25.4 mm) from the top and bottom edges. The resulting pattern contains four large sections, each 4 by 5 in. (102 by 127 mm) held on the back by the substrate lamina or by adhesive, and supported on the unscored side by the specimen holder. Unapplied laminates should be grooved through three fourths of the thickness; materials applied to a base should be scored completely through the finish.

4.9.4 The flammability test of the sample material shall be conducted under the appropriate condition of 4.9.1 to 4.9.3 that had yielded the highest flame spread index. However, if in a grooved assembly any increase in the flame-spread index can be attributed primarily to accelerated flame travel within the grooves, the flammability test shall be conducted in the conventional manner, without grooves.

4.10 Finish materials intended for use without attachment and those being tested without application to a substrate shall be tested with wire mesh support as described in 4.9.2, if in the initial flammability test the material tends to crack or split, and fall from the specimen holder, leaving no material, or a reduced quantity, for the test.

4.11 All specimens except those over 3/4-in. (19.0-mm) thick shall be backed with 1/2-in. (12.7-mm) asbestos millboard of 60 lb/ft^3 (960 kg/m^3) density. To protect the back surface of the specimen, a 1 by 6-in. (25 by 152-

mm) strip of heavy asbestos paper shall be placed across the top edge of the specimen and folded down over the back face of the millboard.

5. Conditioning

5.1 Predry specimens for 24 h at 140 F (60 C) and then condition to equilibrium at an ambient temperature of 73 ± 5 F (23 ± 3 C) and a relative humidity of 50 ± 5 percent.

6. Number of Test Specimens

6.1 At least four specimens of each sample shall be tested under the conditions applicable to the type of sample.

7. Procedure

7.1 Remove objectionable combustion deposits from the thermocouples by brush-cleaning them at least once every week when the apparatus is used 8 h each day for a week. Clean them more frequently whenever periodic visual inspection indicates. With very heavy smoke-producing materials, it may become necessary to clean the thermocouples after each test.

7.2 Ignite the gas-air mixture passing through the radiant panel and allow the unit to heat for 0.5 h. Before each test, check the radiant output by means of the radiation pyrometer placed in such a manner as to view a central panel area about 10 in. (254 mm) in diameter. Adjust the rate of gas supply to maintain the radiant output equal to that which would be obtained from a black body of the same dimensions operating at a temperature of 1238 ± 7 F (670 ± 4 C).

7.3 Turn on the recording potentiometer for measuring the stack thermocouple temperature.

7.4 Weigh the glass fiber filter paper to an accuracy of 0.0001 g. Place the smoke sampling device in position above the stack and adjust the flow rate.

7.5 Ignite the pilot light and adjust it to give a flame 2 to 3 in. (51 to 76 mm) long. Move the pilot light into position in front of the radiant panel. The pilot burner shall remain ignited and in position for the duration of the test whether or not there is flaming of the specimen. For materials which tend to shrink or contract upon application of heat, position the pilot burner flame so as to directly contact the specimen.

7.6 Place the specimen holder containing the specimen into the supporting framework and start the timer simultaneously. A maximum of 5 min shall elapse between the time the specimen is removed from the conditioning chamber until it is placed in position on the framework. During this time place the specimen and holder in an appropriate vapor barrier jacket, removing it only when the specimen and holder are placed on the framework for the test. A polyethylene bag has been found suitable as a vapor barrier envelope.

7.7 Record the time of arrival of the flame at each of the 3-in. (76-mm) marks on the specimen holder or on the corresponding lines on the specimen, or both. Also record the maximum temperature rise of the stack thermocouples.

7.8 Record any observations made of any behavior characteristics of a specimen that appear to be of interest.

7.9 *Exposure Time*—The test is completed when the flame front has progressed the full length of the specimen, or after an exposure time of 15 min.

7.10 *Weight of Smoke Deposit*—Reweigh the glass fiber filter paper after the test and record the smoke deposit to the nearest 0.0001 g. Correct this weight for the loss of equilibrium moisture content of the glass fiber filter disks. Determine the magnitude of the correction by measuring the loss in weight of the disk during a test exposure of an asbestos-cement board specimen. After weighing, measure the smoke sampling filter disk for optical density with a transmission densitometer, making a comparison of the smoke deposit area of the disk with the clear peripheral area.

8. Calculations

8.1 Calculate the flame spread index, I_s, of a specimen as the product of the flame spread factor, F_s, and the heat evolution factor, Q, as follows:

$$I_s = F_s Q$$

where:

$$F_s = 1 + (1/t_3) + [1/(t_6 - t_3)] + [1/(t_9 - t_6)] + [1/(t_{12} - t_9)] + [1/(t_{15} - t_{12})]$$

$t_3 \ldots t_{15}$ correspond to the times in minutes

from initial specimen exposure until the arrival of the flame front at the positions 3 ... 15 in. (76 ... 381 mm), respectively, along the length of the specimen.

$$Q = 0.1\ (T/\beta)$$

where:

0.1 = an arbitrary constant,

T = the observed maximum stack thermocouple temperature rise in degrees Fahrenheit over that observed with an asbestos-cement board specimen, and

β = the maximum stack thermocouple temperature rise for unit heat input rate of the calibration burner (see Appendix A1.3) in degrees Fahrenheit (per Btu per min). This is a constant for the apparatus.

8.2 *Surface Flash*—The relationship defining the flame spread factor, F_s, presumes sustained flaming along a portion or the entire width of the specimen. In those tests in which flames flash across all or a significant portion of the surface without immediately establishing sustained flaming, this relationship would be difficult to apply. In such cases, therefore, if the flash progresses and recedes over at least 6 in. (152 mm) of the length of the specimen in 3 s or less, the material shall be reported "Flash Potential" and the time at which the flashing occurred shall be reported. If sustained flaming occurs or continues after flashing from the point to which the flash receded, I_s is computed in the normal manner, and shall be reported in addition to "Flash Potential." But if a flash of any length occurs and its duration is greater than 3 s, the distance to which the flash traveled shall be considered the sustained flame front and I_s computed in the normal manner.

8.3 Materials that have a tendency to exhibit rapid running or dripping of flaming material, either separately or in conjunction with a general flame front advance, due to melting and the nearly vertical inclination of the specimen during test, shall be noted as "Running (or Dripping) of Flaming Material," and the time of occurrence should be reported in addition to the regularly determined flame spread index.

8.4 For low density, cellular or other materials in which the flaming is rapid and is limited to the early part of the test exposure, a slight temperature rise may remain undetected due to lag of the stack thermocouples. Provided the stack thermocouple temperature does not exceed that measured with an asbestos-cement specimen (see Appendix, A1.3.1) by more than 10 F (5.5 C), the value of T for the test specimen shall be determined with respect to the stack thermocouple temperature for the asbestos-cement board specimen at a time corresponding to that at which the maximum stack thermocouple temperature was observed for the test specimen. Continuous recording of the stack thermocouple temperature is required in such cases.

8.5 For some materials, particularly those with flame-retardant treated surfaces, a significant delay may occur in the start of surface flaming, followed by a very rapid flame progression which may envelop one or more markings before a sustained flame establishes itself. In many cases, the progression of the sustained flame front after this has occurred will be regular, and times for the flame front to pass succeeding 3-in. (76-mm) marks may be readily measured. However, in some cases, the sustained flame front progression will be limited, providing no additional time-distance data. If the rapid flaming envelops two or more markings, the time interval or intervals involved, even if measurable, would result in a disproportionately high number being used in summing up the components of the flame-spread factor. In order to obtain more representative factors in such situations, the following procedures shall be used:

8.5.1 Measure or estimate the distance D, in inches, and the corresponding time t, in minutes, when flaming establishes very rapidly past the 3-in. (76-mm) mark or past the 3 and 6-in. (76 and 152-mm) marks or past the 3, 6, and 9-in. (76, 152, and 228-mm) marks.

8.5.2 In the case where succeeding time-distance data are available, plot D on rectangular coordinates as a function of t on logarithmic coordinates.

8.5.3 In the case where no succeeding time-distance data are available, determine the distance D_o corresponding to a time of 1.0 min from the equation,

$$D = D_o + 6.5 \ln t$$

8.5.4 Extrapolate the curve, or line, back to obtain estimated times for the 3-in. (76-mm) or 3 and 6-in. (76 and 152-mm) markings.

8.5.5 Using the value of D_o and the same equation from 8.5.3, calculate the corresponding times for distances of 3, 3 and 6, or 3, 6, and 9 in. (76, 76, and 152 or 76, 152, and 229 mm).

8.5.6 Use these extrapolated or calculated times and corresponding distances to calculate the flame-spread index.

9. Report

9.1 The report shall include the following:

9.1.1 Complete identification of the material tested, including type, source, manufacturer's code numbers, form, principal dimensions, color, previous history, etc.,

9.1.2 Type of test specimens, dimensions, and whether tested with or without backing or aluminum foil,

9.1.3 Conditioning procedure used,

9.1.4 Number of specimens tested,

9.1.5 Exposure time and whether completely destroyed or exposed for 15 min,

9.1.6 Average flame spread index for each set of specimens and range,

9.1.7 Weight of smoke deposit, and also optical density when measurements are within the range indicated in 3.1.9, and

9.1.8 Any visual characteristics of the individual specimens.

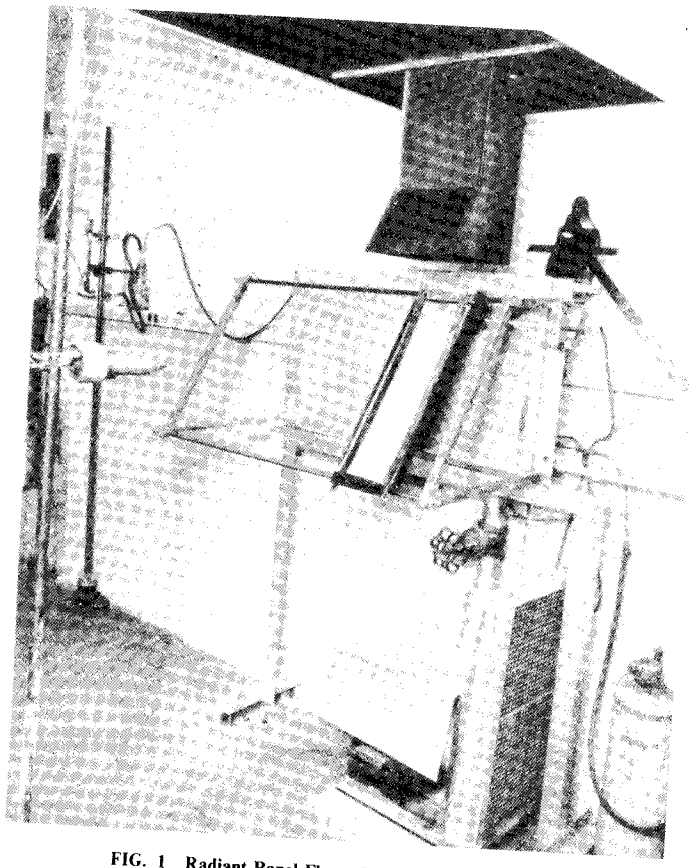
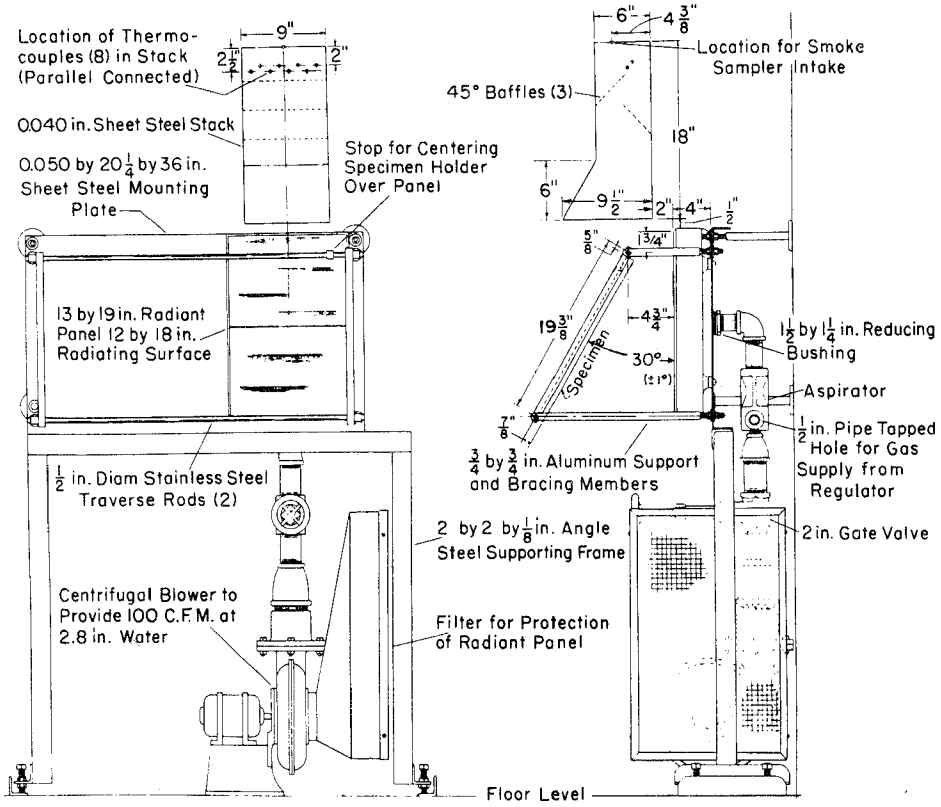


FIG. 1 Radiant Panel Flame Spread Test Equipment.

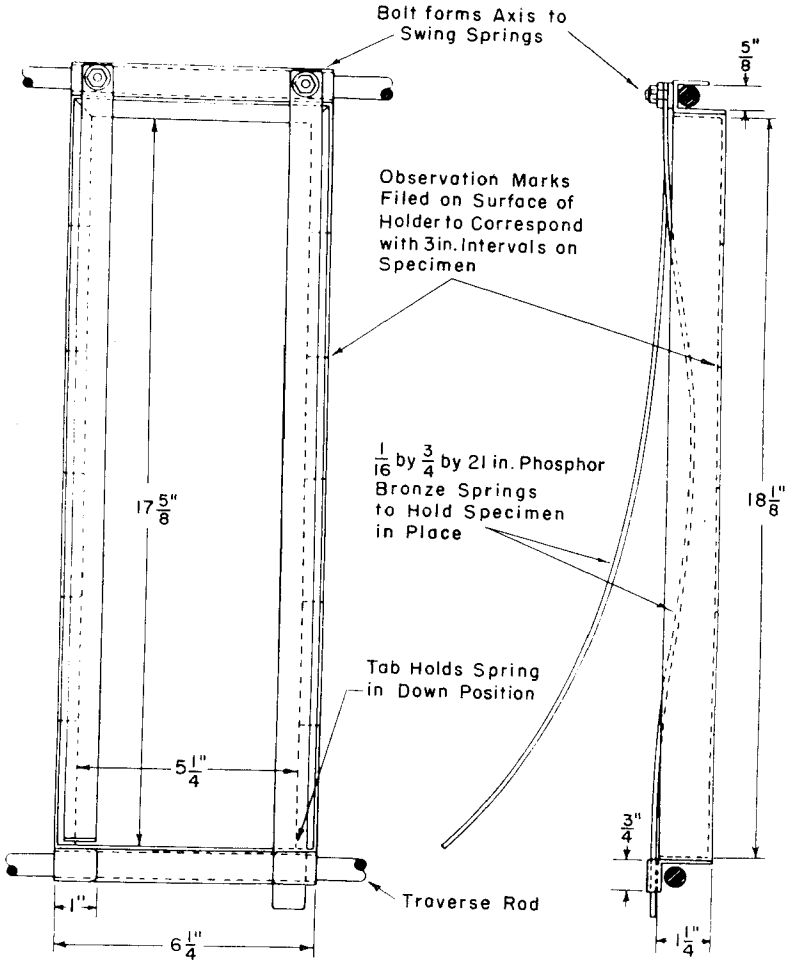


Metric Equivalents

in.	mm	in.	mm
0.040	1.0	6	152
½	12.7	9½	241
⅝	16.0	18	457
⅞	22.2	19⅜	492
1¾	44	¾ by ¾	19.2 by 19.2
2	51	1½ by 1¼	38 by 32
2½	64	12 by 18	305 by 457
2.8	71	13 by 19	330 by 483
4	102	2 by 2 by ⅛	51 by 51 by 3.2
4⅜	111	0.050 by 20¼ by 36	13 by 514 by 914
4¾	121		

100 cfm = 47.21 liters/s

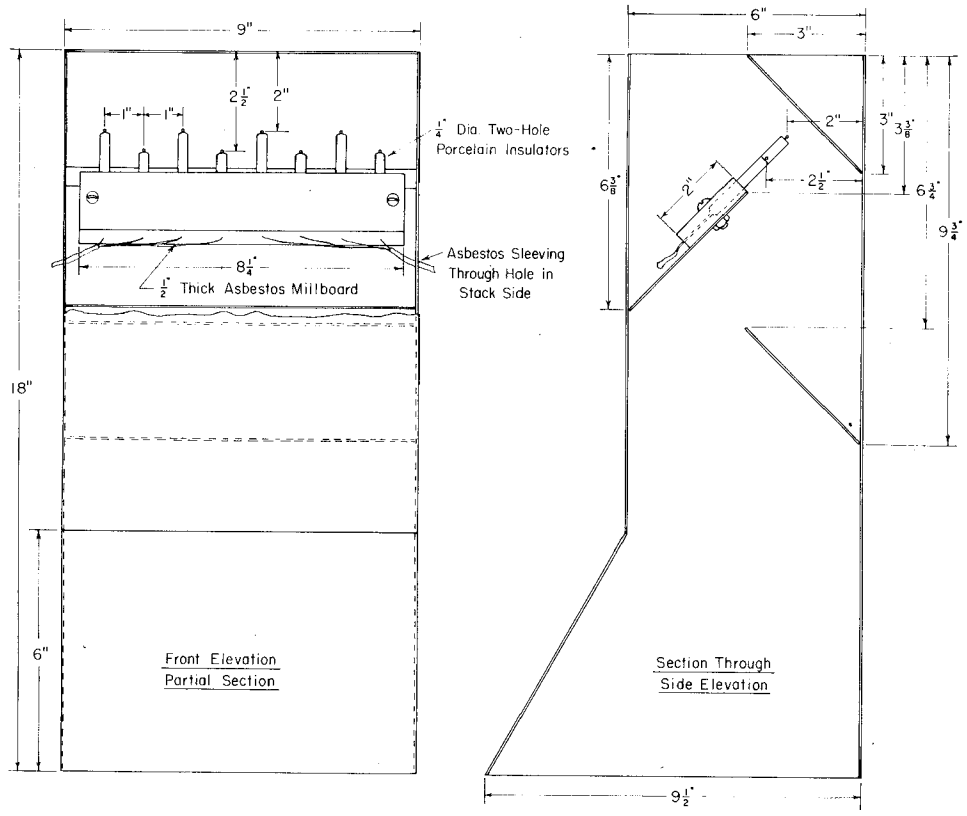
FIG. 2 Details of Construction of Test Equipment.



Metric Equivalents

in.	mm	in.	mm
¼	19.0	6¼	159
1	25	17⅜	433
1¼	32	18⅛	460
3	76	1/16 by ¾ by 21	1.6 by 19 by 533
5¼	133		

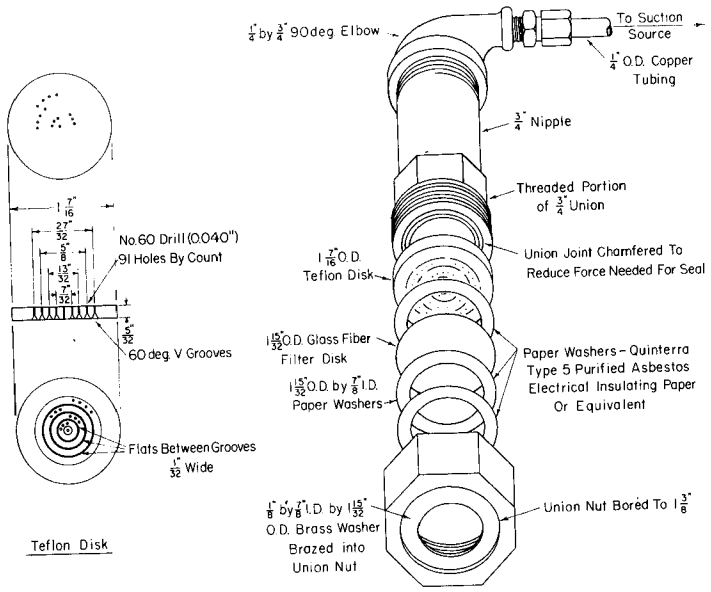
FIG. 3 Specimen Holder.



Metric Equivalents

in.	mm	in.	mm	in.	mm
¼	6.4	3	76	9	229
½	12.7	3⅜	86	9½	241
1	25	6	152	9¾	248
2	51	6¾	171	18	457
2½	64	8¼	210		

FIG. 4 Thermocouple Mounting Arrangement.



Metric Equivalent

in.	mm	in.	mm	in.	mm
1/32	0.8	13/32	10.5	1 3/8	34.9
0.040	1.0	5/8	15.8	1 7/16	36.5
5/32	4.0	3/4	19.0	1 15/32	37.3
7/32	5.6	27/32	21.8	1/4 by 3/4	6.4 by 19.0
1/4	6.4	7/8	22.2	1/8 by 7/8	3.2 by 22.0

FIG. 5 Smoke Sampling Device.

APPENDIX[4]

A1. PROCEDURE FOR CALIBRATION OF APPARATUS

A1.1 Radiation Pyrometer

A1.1.1 Calibrate the radiation pyrometer by means of a conventional black body enclosure placed within a furnace and maintained at a uniform temperature of 1238 F (670 C). The black body enclosure may consist of a closed chromel metal cylinder with a small sight hole in one end. Sight the radiation pyrometer upon the opposite end of the cylinder where a thermocouple indicates the black body temperature. Place the thermocouple within a drilled hole and in good thermal contact with the black body.

A1.2 Smoke Sampling Device

A1.2.1 Any leak in the system will cause a low recorded smoke weight. Check the smoke sampling tube and associated connections periodically by using an impermeable diaphragm in place of the filter disk. With the pump or aspirator in operation, the flowmeter should indicate zero air flow.

A1.3 Stack Thermocouples

A1.3.1 With the panel at operating temperature, and the exhaust blower producing an established stack velocity, note the temperature of the stack thermocouples. It is recommended that initial positioning of the exhaust hood system be made so as to maintain the operating stack thermocouple temperature within the range 356 to 446 F (180 to 230 C) when no specimen is in position. Place an asbestos-cement board specimen in position, ignite the pilot burner, adjust the flame to a 2 to 3-in. (51 to

[4] Robertson, A. F., Gross, D., and Loftus, J., "A Method for Measuring Surface Flammability of Materials Using a Radiant Energy Source," *Proceedings*, Am. Soc. Testing Mats., Vol 56, 1956, pp. 1437–1453, describes in detail a method for testing the surface flammability of building materials developed at the National Bureau of Standards and contains data comparative with other test methods.

76-mm) length, and swing the burner into operating position. Note the mean increase in temperature measured by the stack thermocouples over the final 10 min of the 15-min interval. Use this temperature rise as a base for measurement of stack thermocouple temperature rise in the testing of materials.

A1.3.2 Place an asbestos-cement board specimen, with a ½-in. (12.7-mm) asbestos millboard backing in the test position, and note the ensuing equilibrium temperature of the stack thermocouples which will be used as a base temperature for the following procedure: Prepare a multiported diffusion (no premixed air) burner from a 12 to 15-in. (305 to 381-mm) length of ¼-in. (6.4-mm) standard wrought iron or steel pipe capped at one end and containing ten 0.070-in. (1.8-mm) diameter radial holes spaced ⅝ in. (15.9 mm) on centers along a line parallel to the axis of the pipe. Place the center-line of the pipe burner in horizontal position 1 in. (25.4 mm) (measured along the specimen surface) below the upper exposed edge of the asbestos-cement board specimen. The pipe wall shall be in contact with both side edges of the specimen holder so that the portion of the pipe containing the burner holes is centered with respect to the specimen. The axes of the burner holes shall be vertical causing flames from the burner to impinge at or near the top of the asbestos-cement board specimen. The type and orientation of the yellow diffusion flames produced are comparable to the flames emitted from a burning specimen. Record the maximum stack thermocouple temperature rise above the previously defined base for each of several gas flow rates to the burner, allowing a minimum of 10 min at each flow rate for stack temperature stabilization. The gas supplied to the calibration burner shall be manufactured methane, or natural gas, or combinations of these gases. The gas flow rate to the calibration burner should be measured by means of a calibrated flowmeter. Use the higher (gross) heating value of the gas to convert the gas flow rates to heat input rates. Moisture, temperature, and pressure corrections should be applied, when applicable, to convert the gas flow rates and the higher (gross) heating value of the gas to a dry basis at a standard temperature of 60 F (15.6 C) and a standard pressure of 30.0 in. (762 mm) of mercury. Plot the maximum stack thermocouple temperature rise, in degrees Fahrenheit, as a function of the corresponding measured heat input rate in Btu per min. The slope of the line fitted to these points is the value of β in the flame spread index formula.

A1.4 Calibration Check

A1.4.1 The proper calibration of the radiation pyrometer at a black body temperature of 1238 F (670 C) as described in 3.1.11 and A1.1.1 is important. Where facilities for performing such a calibration are not available to laboratories equipped with the radiant panel test apparatus, a check calibration may be secured upon request to the Fire Research Section, National Bureau of Standards, Washington, D. C. 20025.

A1.5 Surface Flammability Standard

A1.5.1 For checking operational and procedural details of this standard, a surface flammability standard is available, at nominal cost, through the Standard Sample Office, National Bureau of Standards, Washington, D. C. 20025. The use of this standard material does not obviate the need for following the calibration and standardization procedures outlined herein.