FLAMMABILITY AND SMOKE CHARACTERISTICS OF AIRCRAFT INTERIOR MATERIALS

TECHNICAL REPORT
ADS - 3

by

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SUMMARY

Flammability and smoke characteristics of interior materials were determined from a selection of 109 materials representative of present usage in the aviation industry. A comparison was made of the flame-resistant characteristics exhibited by the different materials on the basis of: (1) test method, (2) thickness, weight, composition and backing, (3) fire-retardant treatment, and (4) degradation from use and cleaning. By employing test methods defined in FAA Flight Standards Service Release 453 and Federal Specification eee-T-191b, burning characteristics were obtained in terms of burn rate, burn length, and self-extinguishing time. A Flame-Spread Index and smoke factor also were obtained by making use of the Radiant Panel Test Apparatus.

INTRODUCTION

This project was designed to provide technical information from standard laboratory fire tests that could be used as a basis for defining more acceptable flame-resistant standards and test methods for aircraft interior materials than those now provided by FAA Flight Standards Service (FSS) Release No. 453.

Recent fire experience in air transport passenger compartments and the development of new materials and test methods had suggested that the present standards were perhaps no longer adequate. As part of the project assignment, a laboratory test program was established using the test equipment and facilities at the National Bureau of Standards, Washington, D. C. Under this test program, some 100 different materials representative of materials in current use in commercial air transport were tested for relative flammability by various test methods including that specified in FSS Release No. 453, for direct comparison. Future work on the project will include toxic gas analyses on the combustion by-products of materials and also full-scale cabin fire tests using interiors with different degrees of fire resistance. The result of these tests will be covered in separate reports.

BACKGROUND

The events that preceded this project and were responsible for it being conducted were foremost: (1) concern with recent fire experience involving interior materials in air transport passenger cabins, (2) increased use of plastics and synthetics in interior furnishings, and (3) development of new laboratory test methods and criteria for evaluating flame-resistant characteristics of materials.

An acceptable procedure for showing compliance with the pertinent flame-resistant requirements in CAR's 3, 4b, 6, and 7 is contained in FSS Release 453, dated November 9, 1961. This document is based almost entirely on an earlier Safety Regulation Release 259, dated August 26, 1947. The two documents establish both a test method and a burn-rate limit of 4 inches per minute for showing compliance. However, a burn rate of this magnitude is now generally considered very lenient. A survey of interior materials in aircraft reveals that these are essentially the same as those offered to and used by industry in general; the most notable exception among the aircraft materials being the vinyl-coated fiberglas fabrics. Other exceptions are the synthetic fiber fabrics and

vinyl sheets which are sometimes specially flame-retardant treated. In any case, the degree of flame resistance required by present regulations does not encourage the development or use of better materials at this time. During the last few years, however, as a result of a series of fire in which the interior cabins of several large transport aircraft were severely damaged (Reference 1), the aviation industry has shown an increasing interest in the problem of minimizing the hazard from cabin fires (References 2 and 3). At least one major aircraft company has undertaken an extensive testing program with the object of selecting the best flame-retardant materials available from industry for use in interior cabins. These materials are selected according to their exceptional self-extinguishing properties. A very high percentage of the materials which are found to pass the present regulations fail to meet these more severe tests.

A test program which is concerned with the upgrading of flame-resistant materials needs to consider, first, the validity of the test methods employed to establish new flame-resistant limits and, second, whether such new limits are adequate. Present standards which are based on Federal Specification CCC-T-191b, May 1951, titled "Textile Test Methods," may be inadequate. This title raises the question whether materials other than fabrics may be justifiably considered to fall in this classification since many of the interior materials now in use consist of sheets, laminates, and assemblies of several components containing plastics, glass, and even paper. A second consideration involves the severity of the test method. The rapid spread of fires throughout the cabins of large transports (Reference 1) was surprising in view of the use of materials presumably flame resistant.

The problem of devising more realistic test methods and criteria has engaged the attention of the leading research and testing laboratories. Test methods (References 4, 5, and 6) utilizing large ignition sources, such as fire tunnels heated by large gas flames and a radiant panel, have been developed for this purpose. These more severe methods are used extensively for hazard classification of building materials. Some of the vinyl-coated fabric materials now supplied to the aviation industry were tested in a 25-foot tunnel and displayed the Underwriters Laboratories, Inc., label (Reference 7). These methods also provide a smoke factor for the burning material. This factor (Reference 8) is receiving increasing interest due to the widespread use of plastics which, in general, produce much larger quantities of smoke than do the cellulose-derived materials.

The use of plastics also has been responsible for the concern of late shown over the problem of toxic gases. Normally, the only toxic gas of sufficient concentration to be dangerous to life is carbon monoxide (References 8 and 9). In the case of some heated or burning plastics, however, other gases more toxic than carbon monoxide may be produced in concentrations sufficient to become hazardous (Reference 10). Toxicity is a difficult problem to analyze (References 11 and 12) since it depends to a large extent on the combustion process in an actual fire. Laboratory tests conducted on small samples of interior materials may not provide complete or sufficient information on this hazard. Further tests utilizing a full-scale test article to simulate an actual fire in an aircraft to more accurately determine toxicity effect of the materials will be undertaken in the future as a second phase of this project.

Fire-retardant treatment is effective both by surface coating of the fabrics (References 13 and 14) and by incorporation of the chemicals within the material itself. Published data, however, show that the effect with plastics is erratic (Reference 15). In contrast, the salts used in the coating of the fabrics are generally effective in making the material more self-extinguishing when used in sufficient quantity. However, the treatment is affected by cleaning agents which dissolve the salts (Reference 16). Therefore, the treatment must be renewed to remain effective.

The work described in this report is concerned mainly with a study of test methods and their application to the fire testing of aircraft interior materials. To insure a satisfactory cross section of all materials in common use in aviation, over 100 materials were selected from among some dozen different sources including two aircraft companies, two airlines and, the rest, materials manufacturers. A majority of these materials may be seen to consist of vinyls and synthetic fibers characteristic of modern interior furnishings.

DISCUSSION

Fire Testing

The ability to resist fire is one of the important properties of materials. Materials used in aircraft and subject to fire are divided into four classifications. These are in order of the severity of the requirements as follows: (1) fireproof, (2) fire resistant, (3) flame resistant, and (4) flash resistant. The division between these classifications is more or less arbitrary and dependent upon the intended use of the material.

Fireproof and fire-resistant materials are generally limited to the metals, fiberglas or asbestos. These materials are tested for flame penetration through the material rather than flame spread.

The 4-inch-per-minute burn rate, which is the upper limit of flame-resistant materials, with which this project is concerned, was established prior to the year 1947. The basis for the acceptance of this figure was the flammability of doped cotton fabric with cellulose acetate butyrate which was used as a standard material and shown to have a burn rate of 2 - 4 inches per minute in tests conducted by the National Bureau of Standards.

The factors which determine the degree of flame resistance are: (1) minimum heat, temperature and time required for the material to ignite, (2) rapidity by which the flames propagate once the material is ignited, (3) tendency of the flames to become self-extinguishing upon removal of the ignition source, and (4) heat generated by the burning material. Other factors related to fire-resistant requirements are smoke and toxicity of the gases produced by the burning material. Various test methods have been designed to measure these factors among which are the methods used in this investigation.

The equipment used in the various tests to compare the ignition time, burning rate, self-extinguishing time and smoke production of a large number of materials was that used by industry and government laboratories. To insure that flame-resistant ratings assigned to the materials are valid and generally acceptable, it is essential that both the equipment and test procedures are standardized. By nature, fire tests are difficult to duplicate; therefore, complete uniformity in test methods is essential. Because of the lack of required test equipment at the National Aviation Facilities Experimental Center (NAFEC), use was made of the facilities of the Fire Protection Section, National Bureau of Standards, Washington, D. C. These facilities included a conditioning chamber for the materials, apparatus for testing materials in a horizontal position as in FSS Release 453, apparatus for testing materials in a vertical position, and apparatus for testing materials subjected to a radiant heat source.

The Radiant Panel Test Apparatus was developed by the National Bureau of Standards and has achieved widespread use in testing laboratories and by materials manufacturers as a research tool. The test method has been adopted as an Interim Federal Standard No. 00136b, December 1962, titled "Flame-Spread Properties of Materials." The

types of materials which may be tested by this method include those in the form of "boards, sheets, structural members, heavy fabrics, finish materials, films or sheets and combinations of any of these." Unlike the Bunsen burner fire tests, this apparatus continues to heat the specimen while it is undergoing test, as would be the case in an actual fire involving other surrounding materials. This consideration is absent in the Bunsen burner tests which only consider the burner flame as the sole source of heat feeding the flames.

In addition to the four different methods by which the materials were compared - FSS Release 453, Horizontal Test Method 5906, Vertical Test Method 5902, and Radiant Panel Test Method - there exists other methods for specific applications in connection with flame-retardant treated textiles, plastics, vinyl-coated glass, and synthetic fabrics. In addition to the six test methods contained in Federal Specification CCC-T-191b, other recognized test methods have been established: (1) National Fire Protection Association (Reference 16), (2) American Society for Testing Materials (References 17 and 18), (3) Society of Automotive Engineers (Reference 19), and (4) Military (Reference 20).

Equipment Description

1. Horizontal Rate of Burning Apparatus: This apparatus is used in both the FSS Release 453 and CCC-T-191b Method 5906, and is shown in Fig. 1. The essential parts of the apparatus consist of a Bunsen burner ignition source, a ventilated metal cabinet for draft-free environment, a specimen holder for rigid specimen support, and a stopwatch.

2. Vertical Rate of Burning Apparatus: This apparatus is used in CCC-T-191b Method 5902, and is shown in Fig. 2. The essential parts of the apparatus are a ventilated metal cabinet for draft-free environment, a Bunsen burner ignition source, a specimen holder for rigid specimen support, a set of weights, and a timer.

3. Radiant Panel Flame-Spread Apparatus: The apparatus is shown in Fig. 3. The essential parts of the apparatus consist of a gas-fired radiant panel heat source, a pilot burner ignition source, a specimen holder, a temperature instrumented stack and a smoke sampler. A brief description of each of these parts follows:

a. Radiant Panel: This provides a radiant heat source to the burning material. The radiant panel consists of a porous refractory material fed from the rear with a premixed gas-air supply. Combustion is nearly completed within the pores of the refractory material providing a uniform temperature of 1238^0 F. over its entire area. Dimensions of the radiant surface of the panel are 18 by 12 inches. A radiation pyrometer, shown in the photograph, is used to adjust the temperature of the panel.

b. Pilot Burner: This provides a flame to force ignition at the top of the specimen. The burner consists of a short length of 1I8-inch **I. D.** stainless steel tube with a porcelain nozzle attachment. The burner is fed with acetylene, premixed with air.

c. Specimen Holder: This provides a rigid support for the test specimens and consists of a frame with a clamping arrangement. Overall size of the holder is 19 3/8 by 6 114 inches, allowing an exposed surface of 17 5/8 by 5 114 inches. The holder is inclined at an angle of 30^0 away from the radiant panel which is in a vertical position. Markings on the holder at 3-inch intervals are provided for timing flame propagation.

d. Instrumented Stack: This provides means for measuring the heat rise in the exhaust stack due to the burning of the specimen. Eight chromel alumel thermocouples connected in parallel are placed inside the stack to provide an average stack temperature which is recorded continuously. Airflow through the stack and out through the hood is adjusted to a calibrated air velocity of 100 feet per minute with no heating of the panel.

e. Smoke Sampler: This provides means for measuring the smoke density produced by the burning samples. A sample of the exhaust gases and fumes is aspirated from the top of the stack through a filter paper which collects the solid smoke particles.

Laboratory Tests and Measurements

1. Horizontal Rate of Burning Test Procedure

a. Four test specimens, 13 1/4 by 3 inches, were cut from each sample material. The fabrics were cut lengthwise to the warp direction. (FSS Release 453 specifies tests in both directions of the weave to determine the most critical direction.)

b. The specimens in all fire tests were conditioned for at least 12 hours in a room at 73^0 F. $\pm 5^0$ F. and a relative humidity of 50 percent ± 5 percent.

c. The burner flame was adjusted with no air intake to 1 1/2 inches in height.

d. The specimen was clamped in the holder and positioned inside the cabinet with the 3/4 inch of the flame tip directly below the starting edge of the specimen. Ambient temperature inside the cabinet measured between 95^0 F. and 115^0 F.

e. Ignition time, or the time required for the material to flame, was recorded from the instant the specimen was slid into position over the burner flame until the specimen started to flame.

f. The flame was removed from the specimen after a 15-second exposure only in the case of the FSS Release 453 tests, but was allowed to remain indefinitely in position for Test Method 5906.

g. Flaming time was measured from the time the specimen ignited to the time the flame was self-extinguished or reached a given calibrated distance marker.

h. Burn length was measured from the start wire position. The specimens which were self-extinguishing and those for which burning did not extend beyond the start wire (less than 1.5 inches) were identified in the tabulation of test data by the numeral I. The specimens which burned beyond the start wire but which were self-extinguishing before reaching the stop wire (less than 11.5 inches) were identified in the tabulation of data by the numeral II. The specimens which burned the full length were considered as non-self-extinguishing and were identified in the tabulation of test data by the letter X.

i. Burn rate was measured by dividing the burn length by the flaming time. Burn rates were obtained for the initial 1.5-inch length of the specimen, the final 10-inch length of the specimen and, also, for burn lengths in betw,een these distances. The flame front on the top of the sample was used in all tests to determine the burn rate. The flame below the specimen, however, generally traveled ahead of the flame on top of the burning specimen but was not as well defined.

j. Smoke, odor and burning characteristics of the specimens were noted and recorded.

2. Vertical Rate of Burning Test Procedure

a. Four test specimens, 12 by 3 inches, were cut from the same sample material, lengthwise to the warp direction.

b. The burner flame was adjusted to 1 1/2 inches in height as in the horizontal tests.

c. The specimen was clamped in the holder, placed inside the cabinet, and hung vertically from a horizontal bar, with the bar extended across the centerline of the cabinet and supported by V-blocks at each end. The specimen was positioned so that its edge was *314* inch directly above the center of the burner barrel. The burner was slid into position under the specimen to start the test.

d. Ignition time was measured from the instant the burner was placed under the specimen until the time the specimen began to flame.

e. The burner was removed from beneath the specimen after a 12-second exposure and the test continued.

f. Flaming time was measured from the time the burner was withdrawn until the time the flame was self-extinguished, or until the full length of the sample was burned.

g. Glow time was measured from the instant flaming stopped until the specimen ceased to emit light.

h. Burn length was measured as in the horizontal tests.

1. Char length was measured as the length of the material damaged by the fire, evidenced by tearing of the material by suspending to it specified weights. Char length was normally less than burn length since the former represented the more severely damaged areas from burning.

J. Smoke, odor and burning characteristics of the specimen were noted. Ignition time was usually easily observed since there was a

definite change in the color and shape of the burner flame. Some of the materials such as synthetic fibers melted and fell as flaming droplets which present a problem. Other materials burned so vigorously that the flames reached to the top of the cabinet.

k. Burn rate was calculated by dividing the burn length by the total flaming time including the lZ-second burner exposure time, but minus the ignition time. Specimens which did not burn the entire lZ-inch length were considered as self-extinguishing and were identified in the test data by the numeral I. Specimens which burned completely were considered non-self-extinguishing and were identified by the letter X.

3. Radiant Panel Flame Spread Test Procedure

a. Four test specimens, 18 by 6 inches, were cut from each sample material lengthwise to the warp direction.

b. A calibration of the apparatus was made to determine proper radiant panel and stack temperatures.

c. A filter disk was weighed and placed in the smoke sampler.

d. The specimen was placed in the holder and covered with a I-inch mesh poultry netting. The netting was placed over the exposed area of the specimen for mechanical support. A lIZ-inch thick millboard was placed in the holder for backing up the specimen with a lIZ-inch air gap separating the specimen from the millboard.

e. The pilot burner was ignited and brought into position.

f. The specimen holder was placed into position with the specimen in contact with the pilot flame to initiate the fire test.

g. Ignition time was measured from the instant the specimen was in contact with the pilot flame until the time flaming of the material was first evidenced by a change in the pilot flame.

h. Burn length was measured from observation of the sustained and continuous flaming of the material down the length of the specimen. Time of arrival of the flame front at each succeeding 3-inch interval marker was measured. Flash fires moving up and down the specimen were observed with some materials. These were disregarded in the calculations. Burn length was measured from the last 3-inch marker

past which the flame was observed to have crossed. Actual burn length as such was not recorded. Instead, the flaming times for the flame front to reach the successive 3-inch positions are obtained for use in the calculation of all Flame-Spread Indexes.

i. Burn rate was obtained by dividing the first 3-inch increment length of the specimen by the time required, after ignition, for the flame to reach the 3-inch marker.

j. A smoke factor was determined as the difference in the weight to the nearest 0.1 milligram (mg.) of the filter paper before and after the fire test.

k. A heat factor was determined directly from the rise in stack temperature resulting from the combustion of the test specimen as compared to that of an asbestos-cement board under the same standard test conditions.

l. Flame Spread Index was calculated by combining the flame propagation velocity and the heat evolution test values as shown by formulas in the Interim Federal Standard No. 00136b for the Radiant Panel Apparatus.

m. Coefficient of variation of the Flame-Spread Index between specimens of the same sample material was calculated by standard statistical methods.

n. Smoke and burning characteristics of the specimen were noted.

4. New, Used and Dry Cleaned Materials Test: Fabric and rug materials were received from one source for more direct and easier comparison. Both new and used materials of the same type were dry cleaned. New and dry cleaned specimens were obtained from the same sample material. Used materials were received in the soiled condition that would be typical of normal maintenance routine. The materials were cleaned in accordance with a major air carrier's recommendation and in a commercial plant. The rug material was cleaned with a recommended shampoo and the fabrics were cleaned in Stoddard solvent. Test procedures were identical to those employed in other tests.

Test Results and Analysis

1. Horizontal Burn Rate Tests: The materials used in all fire tests are listed and described in Appendix 1. The test results are tabulated in Appendix 2, Tables I and II. A summary of the test data is presented in Table I of the text. Typical fire damage to a high and a low flammable material is shown in Figs. 4 and 5.

The data show the following characteristics for the materials subjected to the standard fire tests:

93 materials tested, of which -

81 were self-extinguishing within a burn length of II. 5 inches.

60 were self-extinguishing within a burn length of 1.5 inches.

12 were non.self-extinguishing and burned their full length.

4 alone were non-self-extinguishing with an average burn rate of 4 inches per minute or greater. This burn rate exceeds the limit specified in FSS Release 453. In addition, three mOre materials may be considered marginal failures in that one specimen out of four also exceeded this limit.

70 were self-extinguishing with a burn rate of a - 1 inch per minute.

23 were self-extinguishing within a 0.50-minute flaming time.

(Note that Test Method 5906 is a somewhat more severe test method than FSS Release 453 since the burner is not removed after a 0.25-minute flame exposure.)

The above statistics show that the most flammable materials were the fabrics and rugs as these showed the highest flaming time, burn length and burn rate. The uncoated fabrics were generally more flammable than

the coated fabrics. Twelve of the 19 synthetic fiber uncoated fabrics showed a flaming time longer than 2 minutes, while 9 of these showed a burn rate of 2 - 3 inches per minute. Of those nine materials, seven were non-self-extinguishing and burned the full length. The coated fabrics were generally less flammable than the uncoated fabrics such as the synthetic fibers; however, three out of the four materials which failed the FSS Release 453 tests, or equivalent, belong to this category and were outstanding exceptions. These three materials were the simulated leatherettes of vinyl-coated cotton fabric construction. In contrast to the vinyl-coated cotton fabrics, all vinyl-coated fiberglas and dynel fabrics showed no appreciable burning, as well as more rapid extinguishment within 0.50 minute. None of the vinyl sheet materials were self-extinguishing within less than 1.0 minute although the burn rate was within 1.0 inch per minute and the burn distance within 3.0 inches.

Only two other materials besides the fabrics and rugs showed any appreciable burn length. These were plexiglass and neoprene sponge. Neoprene sponge was the only material other than the three fabrics with a burn rate exceeding 4 inches per minute.

The least flammable materials were the heavier and thicker samples such as the laminates and assemblies which generally showed little or no burning. In some cases, although burn rate and distance were negligible, flaming time was considerable due to slow burning.

No direct correlation between flammability and flame-retardant treatment was evident on the basis of scattered tests and the insufficient information on the formulation of the materials obtained from suppliers. In addition to the 11 materials marked as fire-retardant treated, it was known that many other materials also had been treated for aircraft use although no confirmation of this was obtained in writing. Of the 11 fire-retardant materials, only 2 showed a burn length in excess of 1.5 inches.

The effect of both use and cleaning on the flame resistance of the material was not apparent on the four uncoated fabrics and three rug materials tested. No information of any chemical coatings that could have been applied in the manufacture of these materials to decrease their flammability was available. Therefore, it was not possible to infer any effect from the leaching out of the chemical salts deposited in the fabrics which may result from dry cleaning. Presumably, many of the fabrics, plastics, and paper listed had some degree of flame-retardant

treatment. The fire-retardant chemicals are incorporated within the vinyl materials rather than deposited on the surface as in fabrics; therefore, these materials were not affected by the solvent action of cleaning agents.

Test results utilizing FSS Release 453 Test Method for comparison to Test Method 5906 are contained in Appendix 2, Table IL

2. Vertical Burn Rate Tests: A summary of the test results contained in Appendix 2, Table III, is presented in Table II of the text. The data show the following characteristics of the materials tested:

93 materials tested, of which –

67 were self-extinguishing within a burn length of 12 inches.

37 were self-extinguishing within a burn length of 3.0 inches.

26 were non-self-extinguishing and burned their full length.

59 were self-extinguishing within a 0.50-minute flaming time following burner flame removal.

31 were self-extinguishing with a burn rate of 0 - 10 inches per minute.

The above statistics show that the most flammable materials were again the fabrics and rugs, especially the uncoated fabrics. Burn rates of greater than 30 inches per minute were obtained for four fabrics including two dacrons. Only 9 of the 19 uncoated fabrics were self-extinguishing and only 4 of those within 0.50 minute. These latter materials were the dacron or nylon fabrics. In contrast, 21 of the 28 coated fabrics were self-extinguishing within 0.50 minute. This number included the 11 coated fiberglas fabrics and the 4 coated dynel fabrics, the latter which showed zero flaming time. The most flammable fabrics were again the vinyl-coated cotton materials. Of 13 such materials, 5 were non-self…extinguishing and burned the full length. These again included the simulated leatherettes.

All uncoated fabrics showed a burn length of 3.0 inches or more. In contrast, 13 of the 28 coated fabrics showed a burn length of 3.0 inches or less. Both flaming time and burn length were generally greater, while the corresponding burn rate was less for the uncoated than the coated fabrics. The majority of the coated fabrics burned at the rate of 10 - 20 inches per minute compared to 10 inches per minute or less for the uncoated fabrics.

Only one of the two leathers was self-extinguishing.

Out of seven rugs, four were self-extinguishing but the time exceeded 2.0 minutes, which was also typical of the heavier, slower burning sheet materials.

It should be noted that in the vertical test method, in contrast to the other methods, both sides of the materials are subject to the burner flame. In the case of the rugs, both the face and the padding, or backing laminate, were exposed to the burner flame. Thus, in one test the foam rubber backing burned completely while the wool face material burned less than 3.0 inches. The vertical test is severe for materials with a flammable exposed undercoating.

The least flammable materials were again the heavier and thicker rigid laminates and assemblies.

Again, no positive effect of fire-retardant treatment in reducing the flame resistance of the materials was evident.

Further, definite test results showing that either the new, used, or dry cleaned condition of the material affected its flammability were scattered and inconclusive.

3. Radiant Panel Flame-Spread Index and Smoke Factor Tests: A summary of the test results contained in Appendix 2, Table IV, is presented in Table III of the text. The test data show the following characteristics for the materials:

98 materials tested, of which -

65 were self-extinguishing within a burn length of 15 inches.

44 had a Flame-Spread Index rating of 0 - 50.

28 had a Flame-Spread Index rating of 0 - 30.

54 had a smoke factor of 0 - 2 mg.

34 had a smoke factor of 0 - 1 mg.

29 had a Flame-Spread Index rating of 0 - 50 and smoke factor of 0 - 2 mg.

25 had a Flame-Spread Index rating of 0 - 30 and smoke factor of 0 - 2 mg.

18 had a Flame-Spread Index rating of 0 - 30 and smoke factor of 0 - 1 mg.

The above statistics show that all categories of materials, ln contrast to the burner flame tests, are flammable and will burn. The greater severity of the fire tests with the Radiant Panel burns the heavier and thicker materials that remain unaffected by the Bunsen burner flame, thus providing flammability test data for all categories of interior materials. The tendency of the Radiant Panel tests is to raise the flammability ratings of the fabrics with reference to the other categories of materials which is just the opposite of that which is shown by both the horizontal and vertical burn rate tests.

Since the Flame-Spread Index is determined in part by the heat generated by the burning samples, a dependence on weight of the combustible materials should be expected. Thus, materials which showed the smallest index ratings, therefore the best flame characteristics, were seen to be the fabrics, especially the very sheer and light-weight synthetics. Outside of this group, the vinyl and mylar-clad aluminum laminates also had exceptionally good (low) Flame-Spread Index characteristics. All five vinyl laminates in this group showed a Flame-Spread Index rating below 50 and a smoke factor below 2. 0 mg.

Outstanding performance was shown by the vinyl-coated dynel fabrics and the sheer uncoated dacron fabrics. The six fabrics of this type having an average weight of less than O. 7 pound per square yard showed a Flame-Spread Index rating of only 0 - 10 and a smoke factor less than **1.0** mg. In addition to their light weight, the dynel fabrics apparently owe much of their exceptional low Flame-Spread Index characteristics to the tendency of the material to shrivel up and pull away from the flame or heat, thus decreasing its susceptibility to fire. Nylons definitely

tended to show an increase in Flame-Spread Index with weight and, likewise, for addition of metal fibers to the fabric. Out of 15 materials with a Flame-Spread Index rating of 0 - 10, 9 were fabrics; while out of 28 materials with a Flame-Spread Index rating of 0 - 30, 13 were fabrics.

The vinyl-coated fiberglas fabrics again showed superiority over the vinyl-coated cotton fabrics by comparison of the index ratings. Out of a total of 10 fiberglas fabrics, 6 had an index rating of 0 - 50. Out of a total of 10 cotton fabrics, 5 had an index rating of 300 plus. Only two of the cotton fabrics had an index rating of 0 - 50.

The two leathers showed a Flame-Spread Index rating of 100 - 300 with a relatively low smoke factor of 0 - 1 mg.

The five rugs also showed a Flame-Spread Index rating of 100 - 300 but with a much higher smoke factor with the exception of one rug.

Sheet materials showed considerable variation in index ratings. These included the two neoprene foams with a Flame-Spread Index rating over 1500. In contrast, some vinyls and one neoprene showed an index rating as low as 0 - 10 which may have been due to the exceptional fire-retardant treatment of the particular material.

Of 13 assemblies, 6 showed a Flame-Spread Index rating of 0 - 50. Five of these six materials had a vinyl or plastic fiberglas covering or were vinyl-bonded to aluminum. The sixth was an assembly with a plastic covering on polyester sheet backing.

Four of the five paper honeycomb assemblies had a Flame-Spread Index rating of 50 - 100, and one had a Flame-Spread Index rating of 30 - 50.

The smoke factor generally increased with the thickness or weight of the material as well as with the Flame-Spread Index. Vinyls, as is well known, were shown to be very productive of smoke, especially the heavier vinyl sheets.

Further, the vinyl-coated fabrics with an index rating of 0 - 50 also showed a large smoke factor of nearly 2 mg. which was twice that for the uncoated fabrics.

Reflectivity of the materials was expected to be a factor in reducing the Flame-Spread Index, particularly in this test method employing radiant heat. This was shown to be the case for two mylar sheets, one of which was aluminized and both identical except for reflectivity.

Backing of the material was expected to be a factor affecting the Flame-Spread Index because of the severity of the test method. This was shown by testing separately the materials making up the whole assembly. One assembly showed a small change in index because its immediate backing material was less flammable than the surface material. In this case, the I-inch thick more highly flammable paper core was too far removed from the heated surface material to affect the index of the whole assembly. In contrast, another assembly showed that the more exposed highly flammable polyether foam backing significantly increased the index of the fabric covering.

Test results on the effect of fire-retardant treatment on the Flame-Spread Index were conflicting in that these results indicated, if anything, a slight increase in the Flame-Spread Index.

Test results showing the effect of use and cleaning of the materials on the Flame-Spread Index were again inconclusive. Only one rug material showed a definite increase in index with use and after shampooing. However, the effect of increasing significantly the index of one low index curtain material by spot cleaning with perchloroethylene was shown.

The two detergents, one deodorant, and perchloroethylene used In cleaning aircraft materials were shown not to be flammable by a wick test.

4. Comparison of Test Methods and Results: A comparison of the test data obtained by the different test methods shows that:

a. Burn rate by the vertical test method was of the order of 10 times more rapid than that by the horizontal test method with comparative increase in burn length.

b. Self-extinguishing time by either the horizontal or vertical test method was of the same order of magnitude.

c. Burn rate measurements by the FSS Release 453 Test Method closely agreed with those obtained by Test Method 5906 (Horizontal) since the two methods are essentially the same.

d. The vertical test method is somewhat more severe than the horizontal test method in that fewer materials were shown to be self-extinguishing. A burn length of 12 inches by the vertical test method was roughly equivalent to a burn length of 1.5 inches by the horizontal test method.

e. The majority of materials were self-extinguishing by both test methods; therefore, this property may be used as a test criteria for the flame resistance of materials by either method in the place of the less severe requirement of a given maximum burn rate. This test criteria is especially applicable to the vinyls which by nature are self-extinguishing. In the case of the uncoated fabrics, however, a self-extinguishing requirement would be severe since about one-third of the materials tested would fail to meet this requirement in the horizontal test method, and about one-half in the vertical test method.

f. Tests showed that a requirement for flame resistance based on a given burn length rather than on a burn rate is the more practical of the two for the self-extinguishing materials which comprise the bulk of the materials tested by both methods. This is because burn rate measurements in the horizontal test method are considered valid only outside the influence of the burner flame (start wire - 1.5 inches). It has significance and is applicable only to the more flammable materials which show continuous burning with a well-defined self-sustained flame over the entire length of the test sample. It should be noted, however, that the majority of materials were self-extinguishing before reaching the start wire; hence, no burn rate figures would be available if this test alone were used.

g. Tests showed that the flame resistance by the vertical test method based on a maximum self-extinguishing time of 0.50 minute is about equal to a maximum burn length of 1.5 inches by the horizontal test method.

h. The majority of the materials were self-extinguishing within less than 1.0 minute by either the vertical (75 percent) or horizontal (50 percent) test methods.

i. The Radiant Panel Test Method is the most severe of the four test methods.

j. The Radiant Panel Test Method is relatively less severe on the fabrics than on the heavier and thicker materials in comparison to the Bunsen burner test methods which show the opposite results.

k. The Radiant Panel Test Method alone, due to its large heat source, has the capacity to penetrate the thin covering materials of some assemblies to indicate to some extent the flame resistance of the immediate backing component materiaL

L The Radiant Panel Test Method is the only method that yields a Flame-Spread Index rating which takes into account the heat generated by the burning sample.

m. The Radiant Panel Test Method is the only method that yields a smoke factor value in addition to a rating for flame resistance.

n. Although the Radiant Panel Test Method is fundamentally different than the Bunsen burner test methods, low Flame-Spread Index ratings for the materials tested, nevertheless, are in good agreement with requirements for both short burn length and rapid self-extinguishing time to indicate superior flame-resistant requirements by either test method. Thus, of a total of 29 materials with a Flame-Spread Index of 0 - 50 and a smoke factor of 0 - 2 mg., 25 of these materials show both a burn length of less than 1.5 inches (by the horizontal test method) and a self-extinguishing time of less than 0.50 minute (by the vertical test method). The four materials which are exceptions and do not meet all three conditions listed above are the nylons. Because these materials melt and drip in the Radiant Panel Test Method, it was difficult to obtain reproducible data using this method.

CONCLUSIONS

Based on an analysis of the test results obtained on 109 different aircraft interior Inaterials and from a cOInparison of the four test methods to achieve these results, it is concluded that:

1. The FSS Release 453 Test Method is not a suitable test procedure for rnaterials other than fabrics.

2. There are many Inaterials presently available and in use today which are self-extinguishing and which far exceed the £laIne-resistant characteristics required by a 4-inch-per-Ininute maximum burn rate.

3. On the basis of the tests conducted, the vertical test method is a satisfactory alternate to FSS Release 453 as a test method for fabrics that are self-extinguishing.

4. The Radiant Panel Test Method is capable of covering the entire flammability range of the interior Inaterials tested, thus providing FlaIne-Spread Index ratings indicative of the degree of flame resistance.

5. The large number of interior Inaterials containing vinyls or other plastics produce greater quantities of smoke during burning than do the cellulose-derived Inaterials of the same flammability range.

6. The effect of the condition of the material whether new, used, or cleaned on the flame resistance of the fabrics and rugs tested was not significant.

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TABLE I

DATA SUMMARY FOR HORIZONTAL TESTS - METHOD 5906

Material No.	Code	Class I	Class II	Class X	Flaming Time (min.) 0	0-0.5	0.5-1.0	1.0-2.0	2.0+	Burn Rate (I) 0-1	1-2	2-3	3-4	4+	I.5-3.5	3.5-7.5	7.5-II.5
2	F1		0						0			0					0
3		0						0		0							
4		0				0				0							
6			0						0			0					
7			0						0			0					
8			0						0	0						0	
13			0						0		0						
14			0						0			0					
15			0				0					0				0	
16			0				0				0				0		
17			0						0		0					0	
18			0						0				0				
19			0					0				0				0	
20			0						0			0					0
*42		0					0			0							
43			0						0			0					
*44			0						0	0						0	
45			0						0			0					
*70		0				0				0							
5	F2		0				0				0				0		
9		0				0				0							
21		0				0				0							
22		0				0				0							
23			0						0					0			
24		0					0			0							
28		0				0				0							
36		0						0		0							
37			0						0				0				
38			0						0					0			
40			0					0						0			
*46		0					0			0							
48		0					0			0							
49			0						0			0				0	
50			0						0			0					0
51		0				0				0							
52		0				0				0							
53		0					0			0							
54		0					0			0							
55		0						0		0							
56		0				0				0							
60		0					0			0							
61		0				0				0							
62		0				0				0							
63		0				0				0							
64			0				0					0			0		
65		0						0		0							
*92		0					0			0							
*93		0					0			0							
*94		0						0		0							

*Flame-retardant treatment.

Code

F - Fabric
I _ Uncoated, 2 - Coated, 3 - Leather

R - Rug
I - Unpadded, 2 - Padded

S - Sheet, L - Laminate, A - Assembly
I _ Flexible, 2 - Semi-rigid, 3 - Flexible

Class

I Burned less than I.5 inches (start wire).
II Burned less than II.5 inches (stop wire).
X Burned full length.

Note (I) Burn rate measured from start wire.

TABLE I (Continued)

DATA SUMMARY FOR HORIZONTAL TESTS - METHOD 5906

Material No.	Code	Class I	Class II	Class X	Flaming Time (min.) 0	0-0.5	0.5-1.0	1.0-2.0	2.0+	Burn Rate(1) (in./min.) 0-1	1-2	2-3	3-4	4+	Total Burn Length (in.) 1.5-3.5	3.5-7.5	7.5-11.5
67	F3		0						0	0					0		
89			0					0		0					0		
1	R1	0						0		0							
12			0						0	0							0
26		0						0		0							
41			0						0	0						0	
100		0						0		0							
27	R2		0						0	0						0	
99			0						0	0					0		
10	S1	0				0				0							
47			0				0			0					0		
66		0				0				0							
68		0					0			0							
91				0					0					0			
95		0				0				0							
96		0					0			0							
97		0					0			0							
98		0					0			0							
107		0					0			0							
108		0				0				0							
35	S2	0					0			0							
69		0			0					0							
11	53	0							0	0							
"30		0							0	0							
*31		0							0	0							
32		0							0	0							
':'33			0					0		0					0		
34		0							0	0							
77			0						0		0					0	
25	L1	0						0		0							
29		0					0			0							
57		0				0				0							
58	L2	0				0				0							
59		0					0			0							
85	L3	0			0					0							
86		0			0					0							
87		0			0					0							
88		0			0					0							
76	A	0							0	0							
80		0						0		0							
81		0						0		0							
82		0							0	0							
83		0							0	0							
84		0						0		0							
Total	93	60	21	12	5	18	22	16	32	70	5	12	2	4	8	9	4

*Flame-retardant treatment.

Code

F - Fabric
1 - Uncoated, 2 - Coated, 3 - Leather
R - Rug
1 - Unpadded, 2 - Padded
S - Sheet, L - Laminate, A - Assembly
1 - Flexible, 2 - Semi-rigid, 3 - Flexible

Class

I Burned less than 1.5 inches (start wire).
II Burned less than 11.5 inches (stop wire).
X Burned full length.

Note (1) Burn rate measured from start wire.

TABLE II

DATA SUMMARY FOR VERTICAL TESTS - METHOD 5902

Material No.	Code	Class I	Class X	Flaming Time(1) (min.) 0	0-0.5	0.5-1.0	1.0-2.0	2+	Burn Rate (in./min.) 0	0-10	10-20	20-30	30+	Burn Length (in.) 0	0-3	3-6	6-9	9-12
2	Fl	0					0			0							0	
3		0		0									0				0	
4		0		0									0			0		
6			0			0					0							
7			0				0			0								
8		0					0			0								0
13			0				0			0								
14			0				0			0								
15		0				0					0						0	
16		0			0					0						0		
17			0				0			0								
18			0				0			0								
19		0						0		0							0	
20		0				0				0							0	
'42			0				0			0								
43			0			0					0							
'44		0				0					0							0
45			0				0			0								
'70		0		0									0			0		
5	F2	0		0							0				0			
9		0		0									0				0	
21		0			0						0					0		
22		0		0								0				0		
23		0					0				0							0
24		0		0							0					0		
28		0		0							0				0			
36			0					0		0								
37			0				0			0								
38			0			0					0							
40			0		0						0							
*46		0			0					0					0			
48		0		0							0				0			
49		0			0						0					0		
50			0			0					0							
51		0		0							0				0			
52		0		0						0					0			
53		0		0								0				0		
54		0		0						0					0			
55		0		0							0				0			
56		0		0							0				0			
60		0		0							0					0		
61		0		0									0			0		
62		0		0									0			0		
63		0		0								0				0		
64			0		0						0							
65		0		0						0					0			
*92		0			0						0				0			
'93		0			0					0					0			
'94		0			0					0					0			

*Flame-retardant treatment

Code

F - Fabric
1 - Uncoated, 2 - Coated, 3 - Leather

R - Rug
I - Unpadded, 2 - Padded

S - Sheet, L - Laminate, A - Assembly
1 - Flexible, 2 - Semi-rigid, 3 - Rigid

Class

I Burned less than 12 inches.

X Burned full length.

Note (1) Measured after lZ-second burner removed.

(2) Sample only 8 inches long.

TABLE II (Continued)

DATA SUMMARY FOR VERTICAL TESTS - METHOD 5902

Material No.	Code	Class I	Class X	Flaming Time(1) (min.) 0	0-0.5	0.5-1.0	1.0-2.0	2+	Burn Rate (in./min.) 0	0-10	10-20	20-30	30+	Burn Length (in.) 0	0-3	3-6	6-9	9-12
67	F3	0				0				0							0	
89			0				0			0								
1	R1	0			0					0					0			
12			0					0		0								
26			0					0		0								
41			0					0		0								
100		0			0					0					0			
27	R2		0					0		0								
99		0			0					0					0			
10	S1	0			0							0					0	
47			0			0					0							
66		0		0								0				0		
68		0				0					0							0
95		0		0							0				0			
96		0		0							0				0			
97		0			0						0				0			
98		0			0						0					0		
107		0			0						0				0			
108		0		0						0					0			
*109(2)			0				0			0							0	
35	S2		0				0			0								
69		0		0						0					0			
11	S3	0			0					0					0			
*30		0		0					0					0				
*31		0		0					0					0				
32			0					0		0								
*33			0					0		0								
34		0		0						0					0			
77			0					0		0								
25	LI	0			0					0					0			
29		0		0								0				0		
57		0		0									0				0	
58	L2	0		0							0					0		
59		0		0								0				0		
85	L3	0		0					0					0				
86		0		0					0					0				
87		0		0					0					0				
88		0		0					0					0				
76	A	0		0					0					0				
80		0			0				0					0				
81		0				0			0					0				
82		0			0				0					0				
83		0			0				0					0				
84		0			0				0					0				
Total	93	67	26	37	22	11	14	9	12	39	28	7	7	12	25	17	10	4

*Flame-retardant treatment

Code

F - Fabric
1 - Uncoated, 2 - Coated, 3 - Leather
R - Rug
1 - Unpadded, 2 - Padded
S - Sheet, L - Laminate, A - Assembly
1 - Flexible, 2 - Semi-rigid, 3 - Rigid

Class

I Burned less than 12 inches.
X Burned full length.

Note (1) Measured after 12-second burner removed.
(2) Sample only 8 inches long.

TABLE III

DATA SUMMARY FOR RADIANT PANEL TESTS

Material No.	Code	Flame Spread Index - Is 0-10	10-30	30-50	50-100	100-300	300+	Smoke Factor - (mg.) 0-0:5	0.5-1.0	1.0-2.0	2.0-3.0	3.0+	Burn Kate (InItIal 3" Length) (in. Imin.) 0-5	5-10	10-25	25+
2	Fl		0					0					0			
3		0						0					0			
4		0						0					0			
6						0			0				-			
7							0		0				-			
8						0						0	-			
13						0			0						0	
14						0		0							0	
15				0							0				0	
16				0				0							0	
17						0				0					0	
18					0				0						0	
19			0					0						0		
20		0						0					0			
'42						0				0				0		
43							0	0								0
'44						0				0					0	
45						0			0						0	
'70			0					-						0		
5	F2					0					0		-			
9		0						0					-			
21					0					0					0	
22			0						0						0	
23							0				0				0	
24				0							0			0		
28		0							0				0			
36					0							0			0	
37							0					0				0
38							0					0				0
40							0			0						0
:'46					0							0	0			
48				0						0			0			
49						0					0				0	
50							0			0					0	
51					0					0				0		
52				0					0					0		
53				0					0				0			
54					0					0			0			
55							0					0	0			
56						0			0							0
60				0							0				0	
61		0						0					-			
62		0						0					-			
63		0						0					-			
64							0			0						0
65		0								0			-			
67	F3					0		0						0		
89						0			0						0	
1	Rl	0								0			0			
12							0			0				0		
26						0					0		0			
41						0						0	0			

*Flame-retardant treatment

- Complete information not available

Code: F - Fabric
1 - Uncoated, 2 - Coated,
3 - Leather

R - Rug
1 - Unpadded
2 - Padded

S - Sheet, L - Laminate, A - Assembly
1 - Flexible, 2 - Semi-rigid,
3 - Rigid

TABLE III {Continued}

DATA SUMMARY FOR RADIANT PANEL TESTS

Material No.	Code	Flame Spread Index - Is 0-10	10-30	30-50	50-100	100-300	300+	Smoke Factor - (mg.) 0-0.5	0.5-1.0	1.0-2.0	2.0-3.0	3.0+	Burn Rate {Initial 0-5	5-10	10-25	25+
27	R2					0					0		0			
10	Sl					0			0				-			
47						0				0						0
66				0						0					0	
68							0	0								0
90							0					0		0		
91							0	-							0	
95			0					0							0	
96						0		-					0			
97					0			-							0	
98						0		-						0		
107		0							0				-			
108		0							0				-			
*109				0								0			0	
35	S2		0								0			0		
69		0										0	-			
11	S3				0				0						0	
'30					0							0		0		
'31				0								0	0			
32					0							0		0		
'33					0						0			0		
34				0								0	0			
77							0					0	0			
25	L1					0						0		0		
29				0								0			0	
57						0				0						0
39	L2			0							0			0		
58			0							0				0		
59			0								0			0		
85	L3		0							0					0	
86			0							0				0		
87			0						0						0	
88		0						0					-			
71	A	0							0				-			
72			0						0				0			
73						0						0		0		
74				0							0			0		
75			0							0			-			
76					0							0	0			
78						0						0		0		
79				0								0	-			
80					0							0		O´		
81					0							0	0			
82					0							0	0			
83				0								0	0			
84					0							0		0		
Total	98	15	13	16	16	24	14	16	18	20	13	26	23	24	25	9

':'Flame-retardant treatment - Complete information not available

Code: F - Fabl'ic
1 - Uncoated, 2 - Coated,
3 - Leather

R - Rug
1 - Unpadded
2 - Padded

S - Sheet, L - Laminate, A - Assembly
1 - Flexible, 2 - Semi-rigid,
3 - Rigid

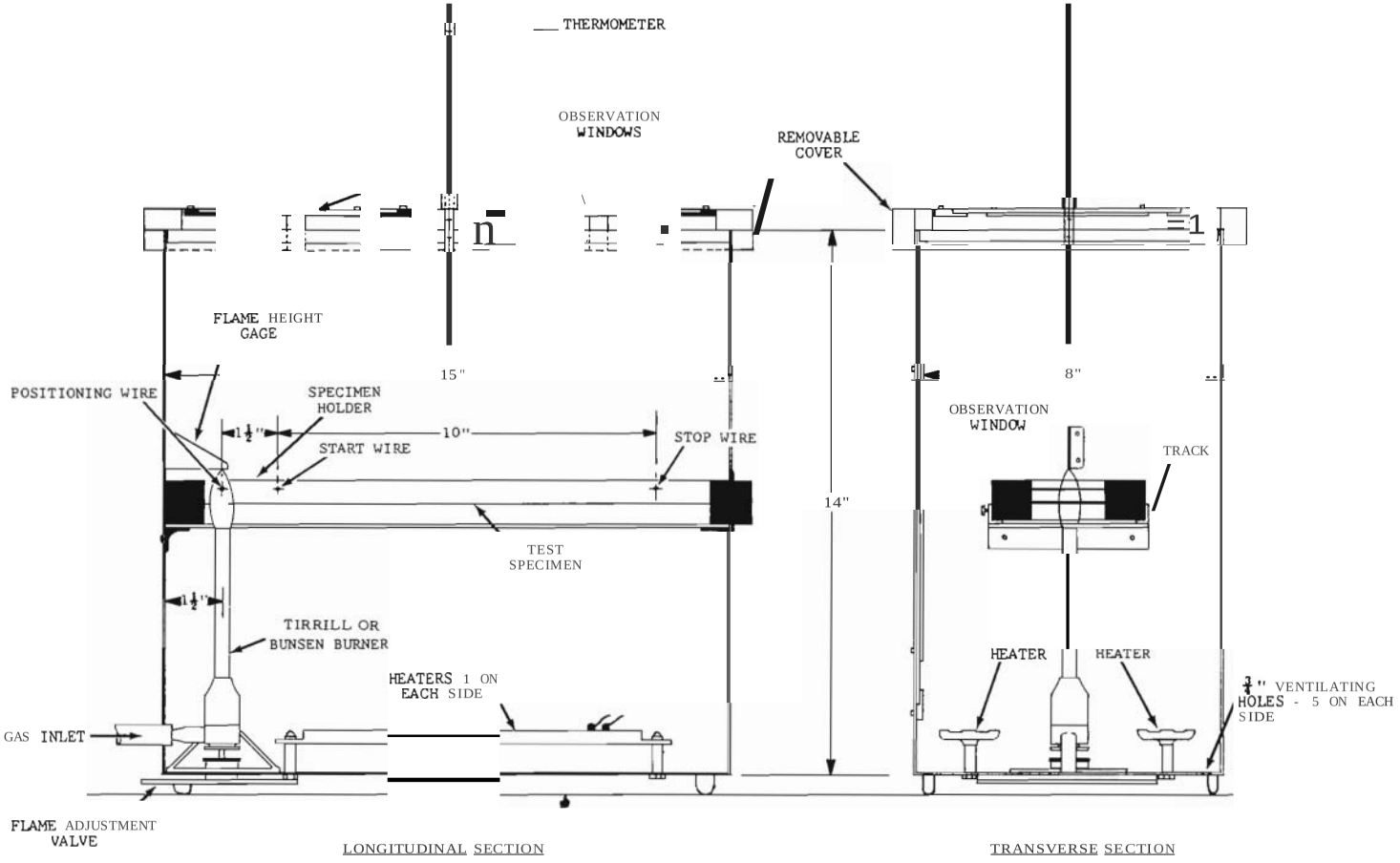

FIG. 1 HORIZONTAL RATE OF BURNING APPARATUS

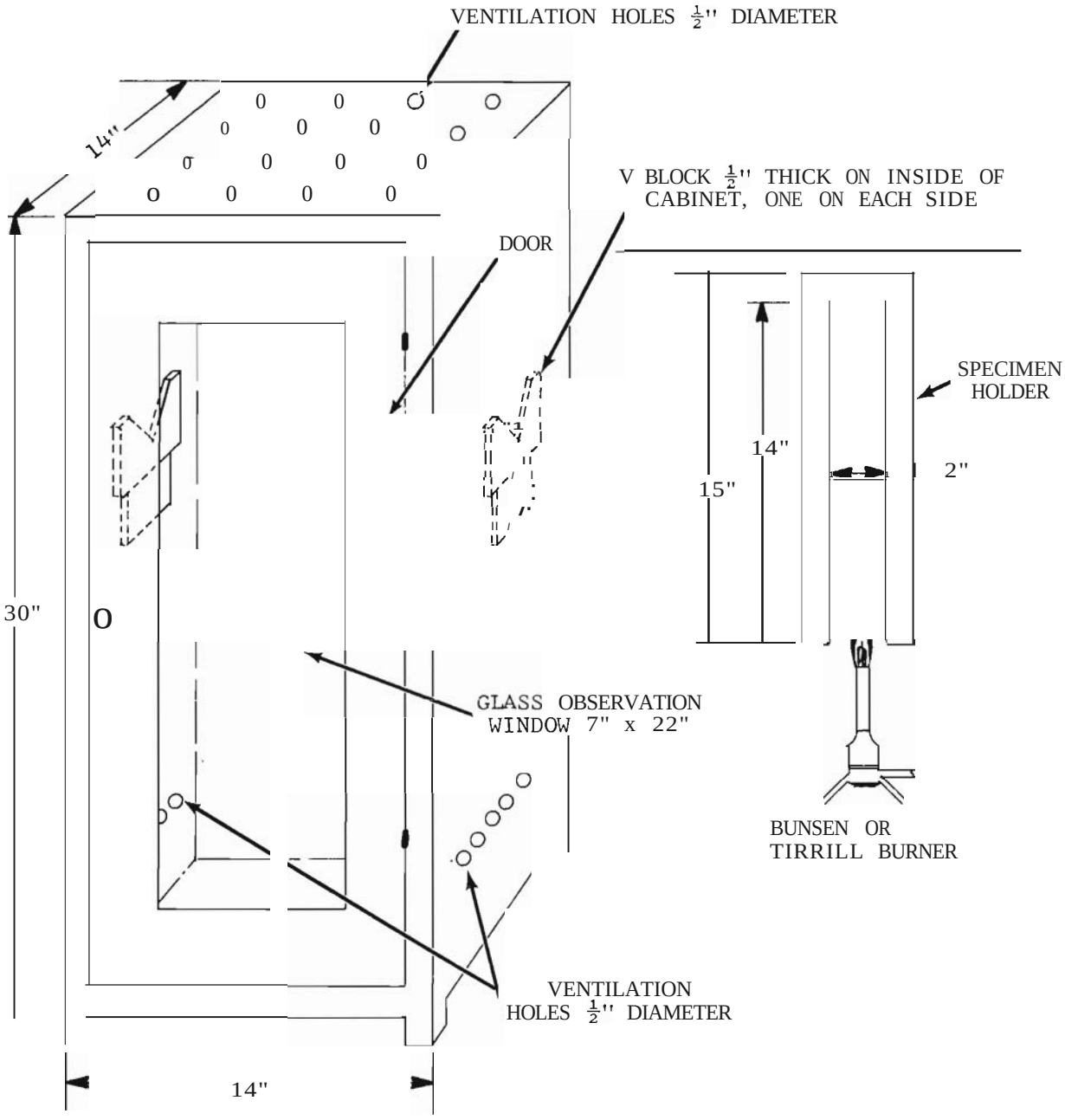

FIG. 2 VERTICAL RATE OF BURNING APPARATUS

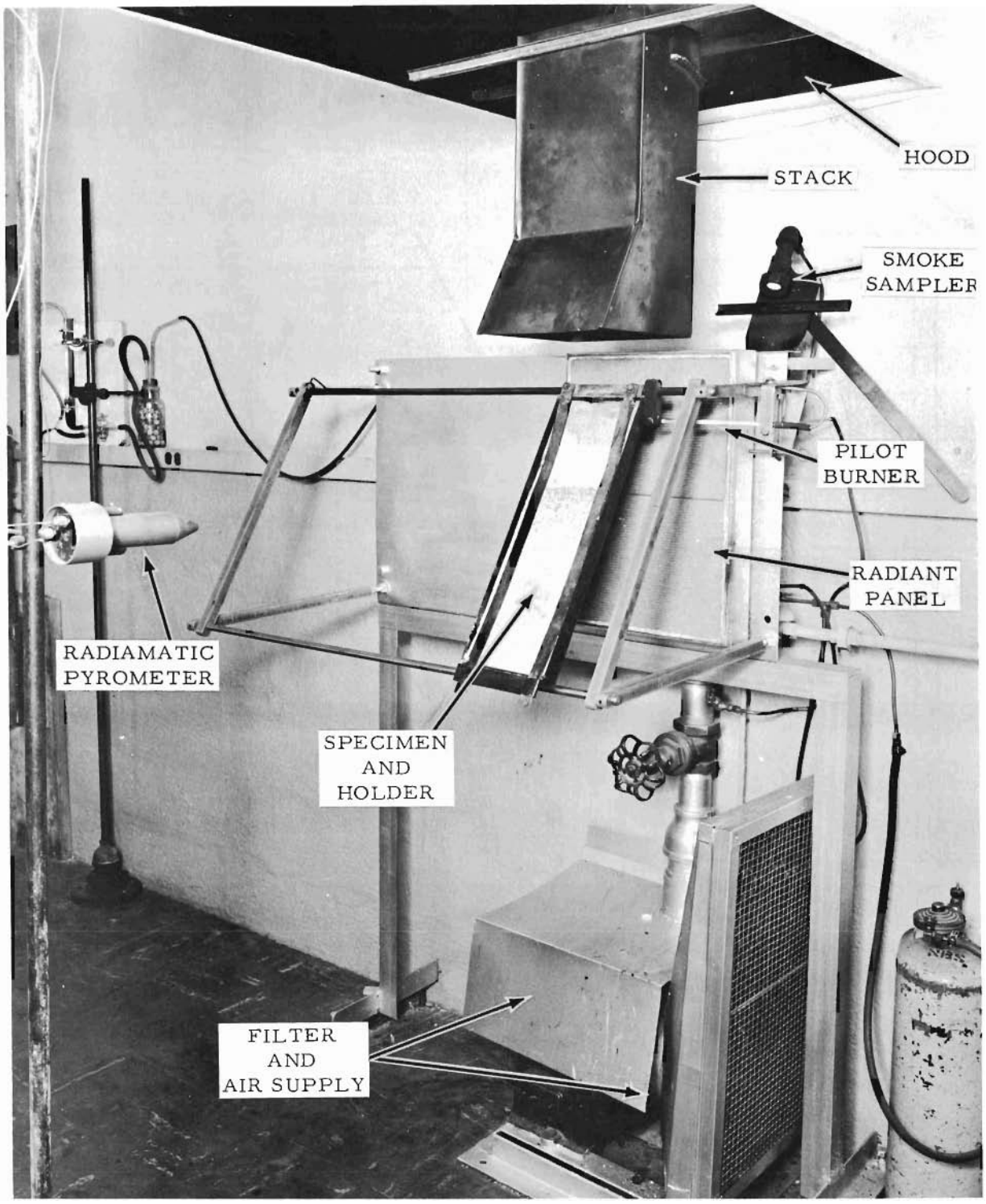

FIG. 3 RADIANT PANEL FLAME-SPREAD APPARATUS (ASSEMBLY)

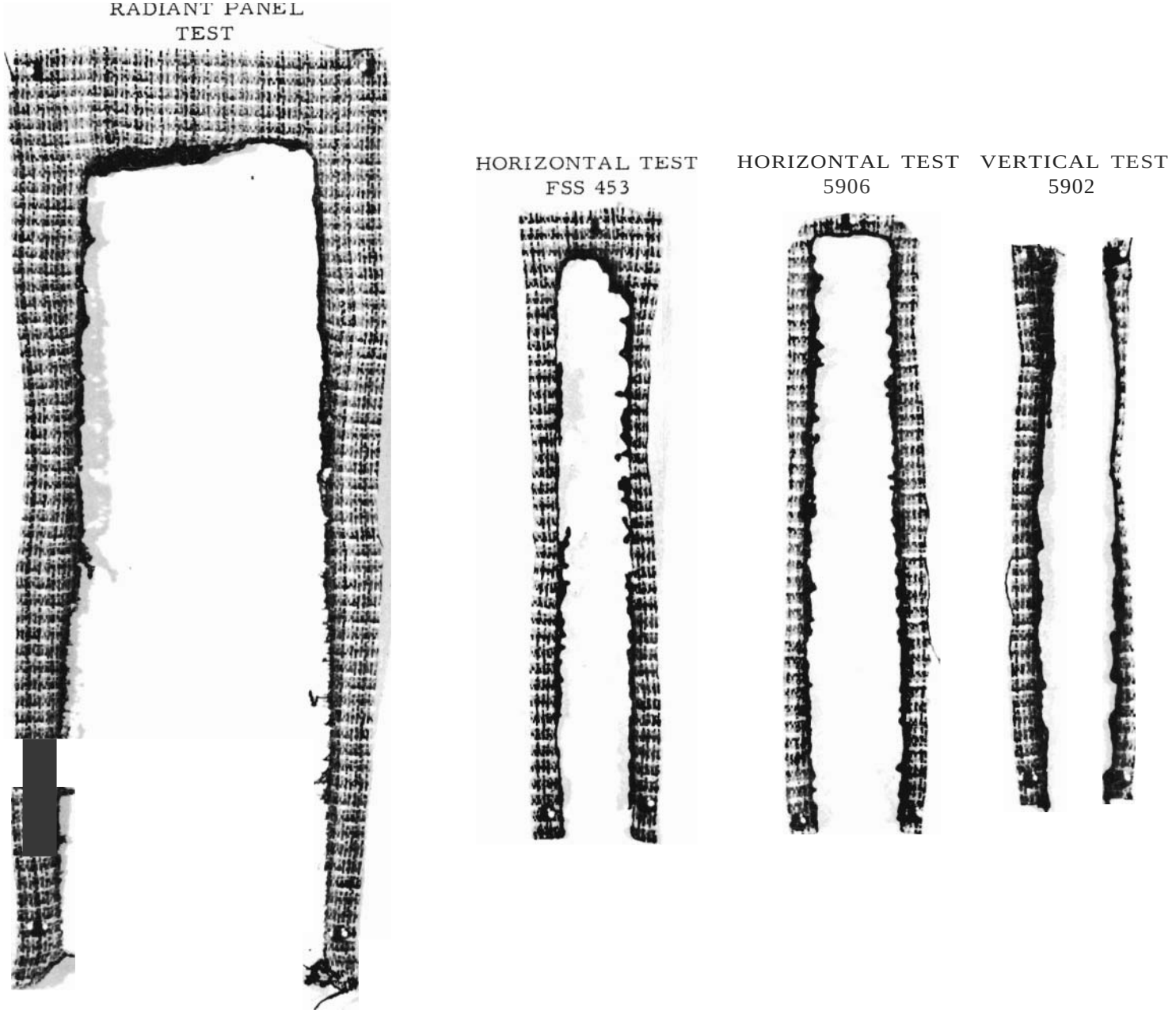

FIG. 4 HIGH FLAMMABLE MATERIAL

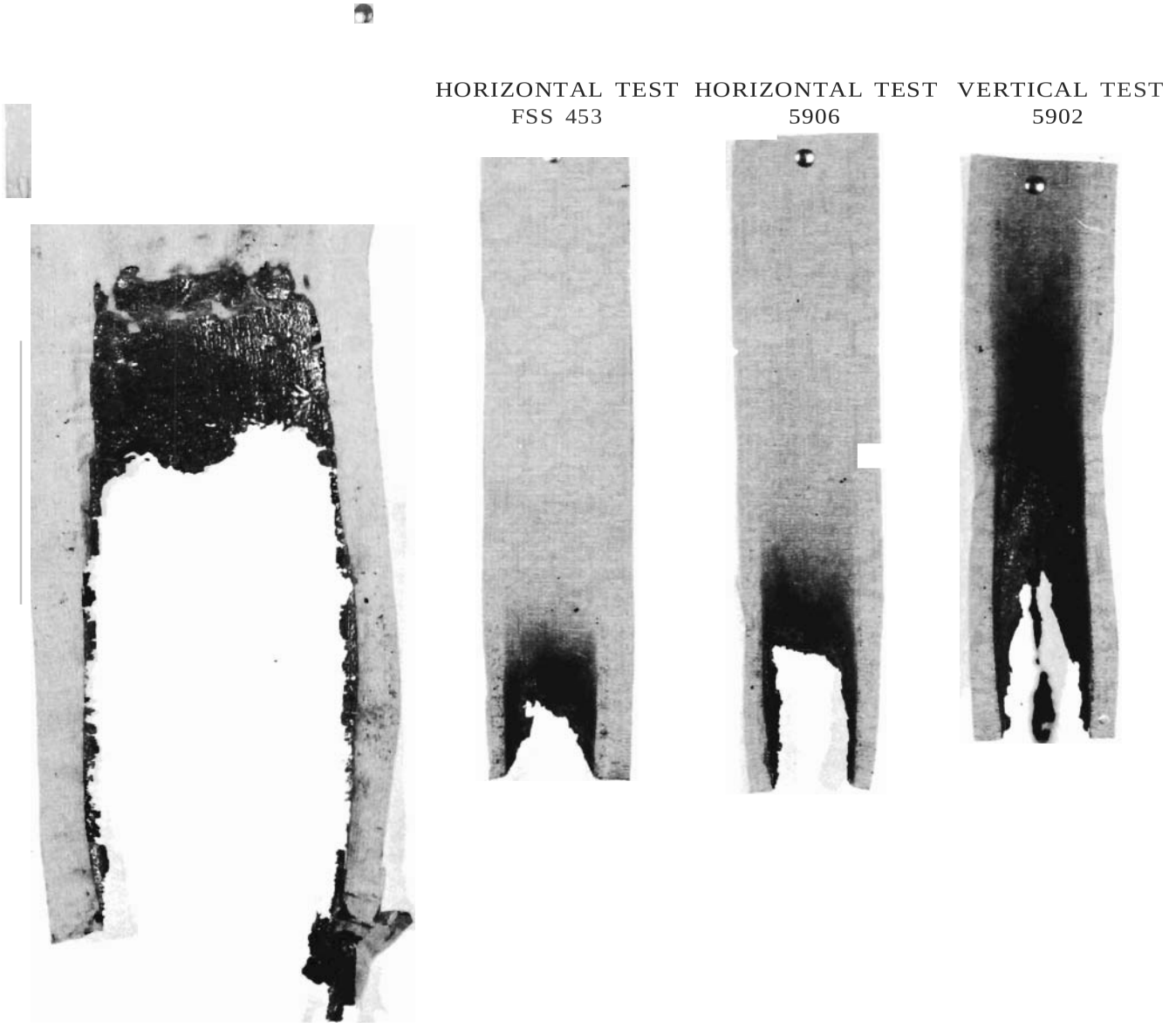

FIG. 5 LOW FLAMMABLE MATERIAL

APPENDIX I

MATERIALS DESCRIPTION

MATERIALS DESCRIPTION

No.	Code	Sample Thickness (in.)	Weight (lb./sq.yd.)	Designation	Use	Composition
1	R1	0.21	2.44	Rug (UP)	Flooring	Wool backed by Cotton with Neoprene base
2	F1	0.025	0.54	Fabric (UC)	Drapery	Nylon
3	F1	0.005	0.11	Fabric (UC)	Curtain	Dacron
4	F1	0.006	0.12	Fabric (UC)	Curtain - liner	Dacron
5	F2	0.020	1.11	Fabric (C)	Upholstery	Vinyl backed by Cotton
6	F1	0.018	0.66	Fabric (UC)	Upholstery	
7	F1	0.031	0.66	Fabric (UC)	Upholstery	
8	F1	0.034	1.20	Fabric (UC)	Upholstery	Nylon
9	F2	0.012	0.65	Fabric (C)	Ceiling	Vinyl backed by Dynel
10	S1	0.010	0.66	Sheet (F)	Panel and Door covering	Vinyl
11	S3	0.030	1.97	Sheet (R)	Bulkhead and Galley covering	Melamine backed by Phenol
12	R1	0.30	3.6	Rug (UP)	Flooring	Acrilan backed by Furane resin
13	F1	0.030	0.86	Fabric (UC)	Upholstery	Nylon, Cotton, Viscose and Metal

MATERIALS DESCRIPTION (Continued)

No.	Code	Sarnp Ie Thickness (in.)	Weight (lb./sq.yd.)	Designation	Use	Composition
14	FI	0.020	0.63	Fabric (UC)	Drapery in Coat Compartment	Nylon and Metal
15	FI	0.027	0.60	Fabric (UC)	Upholstery	Nylon
16	FI	0.025	0.63	Fabric (UC)	Upholstery	Nylon
17	FI	0.026	0.73	Fabric (UC)	Upholstery	Nylon, Cotton and Metal
18	FI	0.030	0.73	Fabric (Ue)	Upholstery	Nylon
19	FI	0.020	0.57	Fabric (UC)	Curtain - window	Nylon
20	FI	0.020	0.60	Fabric (UC)	Drapery - coat and galley	Nylon
21	F2	0.015	0.73	Fabric (C)	Ceiling - lavatory	Vinyl backed by Cotton
22	F2	0.008	0.60	Fabric (C)	Lining - wall	Vinyl backed by Fiberglas
23	F2	0.022	1.01	Fabric (C)	Upholstery - seat and arm rest	Vinyl backed by Cotton

MATERIALS DESCRIPTION (Continued)

No.	Code	Sample Thickness (in.)	Weight (lb./sq.yd.)	Designation	Use	Composition
24	F2	0.017	1.01	Fabric (C)	Lining - wall and ceiling	Vinyl backed by Cotton
25	L1	0.30	5.48	Laminate (F)	Flooring - under seats	Vinyl backed by Fiberglas on Foam pad (1/4")
26	R1	0.21	3.22	Rug (UP)	Flooring	Wool
27	R2	0.36	3.82	Rug (P)	Flooring	Wool backed by Foam pad (3/16")
28	F2	0.012	0.66	Fabric (C)		Vinyl backed by Fiberglas
29	L1	0.17	2.19	Laminate (F)		Vinyl backed by Fiberglas on Foam pad (1/8")
30	S3	0.19	11.7	Sheet (R)	Window frames, Food tray, etc.	Vinyl 0/16")
31	S3	0.09	5.50	Sheet (R)		Vinyl 0/32")
32	S3	0.063	3.58	Sheet (R)		Vinyl 0/16")
33	S3	0.057	3.55	Sheet (R)		Vinyl (1/16")

MATERIALS DESCRIPTION (Continued)

No.	Code	Sample Thickness (in.)	Weight (lb./sq.yd.)	Designation	Use	Composition
34	S3	0.043	2.63	Sheet (R)		Vinyl 0/64")
35	S2	0.021	1.09	Sheet (SR)	Paneling	Resin-filled Cotton
36	F2	0.020	1.20	Fabric (C)	Paneling	Vinyl backed by Nylon - both sides coated
37	F2	0.060	1.93	Fabric (C)	Upholstery	Vinyl backed by Cotton
38	F2	0.045	1.09	Fabric (C)	Upholstery	Vinyl backed by Cotton
39	L2	0.036	2.73	Laminate (SR)	Lining - cargo compartment	Vinyl backed by Fiberglas Polyester filler
40	F2	0.025	0.98	Fabric (C)		Vinyl backed by Cotton
41	R1	0.24	3.39	Rug (UP)	Flooring	Nylon, Dacron
42	F1	0.040	0.98	Fabric (UC)	Upholstery	Nylon, Viscose
43	F1	0.030	0.86	Fabric (UC)	Curtain	Cotton, Mohair, Viscose, Metal
44	F1	0.025	0.73	Fabric (UC)		Nylon, Viscose, Metal

MATERIALS DESCRIPTI)N (Continued)

No.	Code	Sample Thickness (in.)	Weight (lb./sq.yd.)	Designation	Use	Composition
45	Fl	0.060	0.79	Fabric (UC)	Uplolstery	Nylon, Cotton, Dacron
46	F2	0.034	1.65	Fabric *(C)*	Up10lstery - seat	Vinyl backed by Cotton
47	51	0.011	0.73	Sheet (F)	COTering - allminum panel	Vinyl
48	F2	0.020	1.52	Fabric *(C)*	COTering - wall	Vinyl backed by Cotton
49	F2	0.020	1.49	Fabric *(C)*	Covering - wa11	Vinyl backed by Cotton
50	F2	0.033	1.30	Fabric *(C)*	Covering - wall	Vinyl backed by Cotton
51	F2	0.010	0.63	Fabric *(C)*	Headlining, Ceiling and Entrance lining	Vinyl backed by Fiberglas
52	F2	0.013	0.89	Fabric *(C)*	Lining - entrance	Vinyl backed by Fiberglas
53	F2	0.017	3.20	Fabric *(C)*	Lining - entrance and door	Vinyl backed by Fiberglas
54	F2	0.022	1.20	Fabric *(C)*	Wainscoting, Partition and Seat panels	Vinyl backed by Fiberglas

MATERIALS DESCRIPTION (Continued)

No.	Code	Sample Thickness (in.)	Sample Weight (lb./sq.yd.)	Designation	Use	Composition
55	F2	0.029	1.80	Fabric (C)	Covering - table top	Vinyl backed by Fiberglas
56	F2	0.010	0.57	Fabric (C)	Headlining, Covering - hatrack (side-wall)	Vinyl backed by Fiberglas
57	L1	0.011	0.67	Laminate (F)	Ceiling, Partition panel	Vinyl, Fiberglas backed by Mylar
58	L2	0.017	1.02	Laminate (SR)	Ceiling, Seat panel	Mylar backed by Fiberglas
59	L2	0.015	0.91	Laminate (SR)	Ceiling, Seat panel	Mylar backed by Fiberglas
60	F2	0.017	1.05	Fabric (C)	Covering - door and partition	Vinyl backed by Fiberglas
61	F2	0.009	0.44	Fabric (C)	Lining - hatrack	Vinyl backed by Dynel
62	F2	0.016	0.63	Fabric (C)	Covering - ceiling panel	Vinyl backed by Dynel
63	F2	0.011	0.51	Fabric (C)	Covering - ceiling panel	Vinyl backed by Dynel

MATERIALS DESCRIPTION (Continued)

No.	Code	Sample Thickness (in.)	Sample Weight (lb./sq.yd.)	Designation	Use	Composition
64	F2	0.005	0.28	Fabric (C)	Covering - insulation blanket	Vinyl backed by Nylon
65	F2	0.031	1.74	Fabric (C)	Flooring - cover	Vinyl backed by Fiberglas
66	S1	0.13	0.76	Sheet (F)	Flooring - underlay	Vinyl sponge (1/8") - closed cell
67	F3	0.045	1.52	Leather	Upholstery - lounge	Leather - top grain
68	S1	0.183	0.57	Sheet (F)	Flooring - underlay	Polyurethane Foam
69	S2	0.114	7.89	Sheet (SR)	Flooring - entry mat	Rubber - synthetic
70	F1	0.032	0.60	Fabric (UC)	Drapery	Acrylic Resin, Metal
71	A	2.50	11.76	Assemhly	Ceiling panel - with blanket	Vinyl backed by Fiberglas fabric (one) with Fiberglas core (2 1/2") - Lead sheet in Fiberglas
72	A	0.50	5.17	Assembly	Window panel	Vinyl clad aluminum (one) with Fiberglas pad (1/2")

MATERIALS DESCRIPTION (Continued)

No.	Code	Sample Thickness (in.)	Weight (lb•Is q.yd.)	Designation	Use	Composition
7J	A	0.75	6.40	Assembly	Hatrack - underside	Vinyl backed by Fiherglas fabric over Polyurethane sheet (3/8") cemented to Styrofoam sheet (1/4") by Polyester glass fabric
74	A	0.047	4.74	Assembly	Window panel	Plastic clad aluminum
75	A	0.50	4.59	Assembly	DADO Panel	Plastic clad aluminum sheet backed by Fiberglas pad *(1/2")*
76	A	0.245	12.20	Assembly	Toilet floor pan	Vinyl reinforced Fiherglas
77	53	NA	NA	Sheet (R)	Windowpane	Plexiglas
78	A	0.06	5.14	Assembly	Air return grille	Polyester Fiberglas
79	A	*0.1.5*	10.81	Assemhly	Toilet ceiling	Vinyl backed by fabric over Polyester glass fabric bonded on wood laminate (3/8")
80	A	1.03	10.9	Assembly	Aisle and Bulk-head partitions	Formica sheet honded on Polyester glass fabric (two) with Honeycomb paper core, (1")

MATERIALS DESCRIPTION (Continued)

No.	Code	Sample Thickness (in.)	Weight (lb./sq.yd.)	Designation	Use	Composition
81	A	1.15	10.1	Assembly	Aisle and Bulk-head partitions	Texolite sheet bonded on Polyester glass fabric (two) with Honeycomb paper core, (1")
82	A	1.04	8.24	Assembly	Aisle and Bulk-head partitions	Vinyl backed by fabric (two) cemented on Polyester glass fabric (two) with Honeycomb paper core (1")
83	A	LOS	12.1	Assembly	Aisle and Bulk-head partitions	Plastic sheet bonded on Polyester glass fabric (two) with Honeycomb paper core, (1")
84	A	0.54	6.46	Assembly	Partitions	Vinyl sheet cemented on Polyester glass fabric (two) with Honeycomb paper core, (1/2")
85	L3	0.042	4.59	Laminate (R)		Vinyl clad aluminum
86	L3	0.044	4.53	Laminate (R)	Lowered ceiling	Vinyl clad aluminum
87	L3	0.035	3.80	Laminate (R)	Closure panel	Vinyl clad aluminum
88	L3	0.040	4.25	Laminate (R)	Light cove	Mylar clad aluminum

MATERIALS DESCRIPTION (Continued)

No.	Code	Sample Thickness (in.)	Sample Weight (lb./sq.yd.)	Designation	Use	Composition
89	F3	0.040	1.05	Leather	Upholstery - lounge	Leather - top grain
90	Sl	1.19	0.71	Sheet (F)	Padding	Neoprene sponge (1")
91	Sl	NA	NA	Sheet (F)	Padding	Neoprene sponge 0")
92	F2	0.028	1.11	Fabric (C)	Upholstery	Vinyl backed by Cotton
93	F2	0.026	1.65	Fabric (C)	Upholstery	Vinyl backed by Cotton
94	F2	0.026	1.65	Fabric (C)	Upholstery	Vinyl backed by Cotton
95	Sl	0.012	0.48	Sheet (F)	Window shade	Vinyl plastisol film
96	Sl	0.29	1.20	Sheet (F)	Padding, Insulation	Vinyl sponge 0/4")
97	Sl	0.27	1.30	Sheet (F)	Padding, Insulation	Vinyl sponge (1/4")
98	Sl	0.27	1.62	Sheet (F)	Padding, Insulation	Vinyl sponge 0/4")
99	R2	0.32	3.77	Rt;g (P)	Floorine	Wool backed by Cotton and Jute with Foam Rubber padding

MATERIALS DESCRIPTION (Continued)

No.	Code	Sample Thickness (in.)	Weight (lb./sq.yd.)	Designation	Use	Composition
100	R1	0.18	2.57	Rug (UP)	Flooring	Mohair backed by Cotton and Jute
101	R2	0.32	4.22	Rug (P)	Flooring	Wool backed by Cotton and Jute with Curon padding (3/16")
102	R2	0.20	2.92	Rug (P)	Flooring	Nylon backed by Dacron with Latex base
103	R2	0.46	3.48	Rug (P)	Flooring	Nylon backed by Cotton, Jute and Dacron with Curon padding (3/16")
104	R2	0.28	4.75	Rug (P)	Flooring	Nylon backed by Synthetic with Foam padding
105	R1	0.22	2.88	Rug (UP)	Flooring	Mohair backed by Cotton and Jute
106	S1	2.75	2.50	Sheet (F)	Padding - seat	Polyether Foam (2 1/2")
107	S1	0.010	0.63	Sheet (F)	Covering - laminate	Polyvinyl
108	S1	0.005	0.35	Sheet (F)	Covering - laminate	Polyvinyl
109	S1	NA	NA	Sheet (F)	Covering - laminate	Polyvinyl

Code and Designation

F - Fabric
1 - Uncoated (UC), 2 - Coated (C), 3 - Leather
R - Rug
1 -Unpadded (UP), 2 - Padded (p)

S - Sheet, L - Laminate, A - Assembly
1 - Flexible (F), 2 - Semi-rigid (SR), 3 - Rigid (R)
FR - designates flame-retardant treatment. List includes: Nos. 30, 31, 33, 42, 44, 46,70, 92, 93, 94 and 109.

APPENDIX 2

FLAMMABILITY TEST DATA ON INTERIOR MATERIALS

LIST OF TABLES (APPENDIX 2)

TABLE I

TEST METHOD 5906 - HORIZONTAL

Part 1 - General Tests - Representative Materials

Material No.	Code	Ignition Time (min.)	Flaming Time (min.)	Burn Length (Measured From Start Wire) (in.)	Burn Rate (Measured From Start Wire) (in./min.)	Burn Rate Initial 1.5 in. (in./min.)	Burn Rate Final 10 in. (in./in.)	Remarks
1	R1	0.10	2.00	0.0	I			
1		0.10	2.00	0.0	I			
Avg.		0.10	2.00	0.0	I			
2	F1	0.25	3.40	8.4	2.7	12.5	11	
3	F1	0.00	0.00	0.0	I			
3		0.10	2.30	0.0	I			
Avg.		0.05	1.20	0.0	I			
4	F1	0.03	0.42	0.0	I			
4		0.17	0.35	0.0	I			
Avg.		0.10	0.39	0.0	I			
5	F2	0.10	0.92	0.2	1.2	2.3	11	Heavy smoke; acrid odor
5		0.12	0.70	0.0	I			
5		0.12	0.75	0.3	1.8	4.1	11	
Avg.		0.11	0.79	0.2	1.5	3.2	11	
6	FI	0.07	4.33	10.0	X	2.5	2.7	
6		0.07	3.84	10.0	X	3.7	3.0	
Avg.		0.07	4.10	10.0	X	3.1	2.8	
7	F1	0.05	4.92	10.0	X	3.6	2.2	
7		0.07	5.53	10.0	X	3.6	2.0	
Avg.		0.06	5.20	10.0	X	3.6	2.1	
8	F1	0.07	6.67	3.6	0.6	1.8	11	
8		0.07	3.22	2.4	0.6	2.9	11	
Avg.		0.07	5.00	3.0	0.6	2.4	11	
9	F2	0.05	0.50	0.0	I			
9		0.05	0.50	0.0	I			
Avg.		0.05	0.50	0.0	I			

TABLE I (Continued)

TEST METHOD 5906 - HORIZONTAL

Part 1 - General Tests - Representative Materials

Material No.	Code	Ignition Time (min.)	Flaming Time (min.)	Burn Length (Measured From Start Wire) (in.)	Burn Rate (Measured From Start Wire) (in./min.)	Burn Rate Initial 1.5 in. (in./min.)	Burn Rate Final 10 in. (in./min.)	Remarks
10	S1	0.05	0.33	0.0	I			
10		0.05	0.35	0.0	I			
10		0.05	0.32	0.0	I			
Avg.		0.05	0.34	0.0	I			
11	S3	0.25	2.50	0.0	I			
12	R1	0.05	13.80	10.0	X	0.98	0.8_	Heavy smoke
12		0.07	6.00	3.5	0.9	0.81	"	
Avg.		0.06	9.90	6.8	0.5	0.89	"	
13	F1	0.08	6.80	10.0	X	2.2	1.6	
13		0.13	6.80	10.0	X	3.2	1.6	
13		0.07	6.80	10.0	X	3.6	1.6	
13		0.07	6.70	10.0	X	3.5	1.6	
Avg.		0.09	6.80	10.0	X	3.1	1.6	
14	F1	0.10	5.30	10.0	X	2.3	2.2	
14		0.07	5.10	10.0	X	2.9	2.2	
14		0.10	5.10	10.0	X	3.1	2.2	
14		0.08	5.10	10.0	X	2.5	2.2	
Avg.		0.09	5.20	10.0	X	2.7	2.2	
15	F1	0.08	0.43	0.0	I			
15		0.07	0.57	0.0	0.0	6.9	"	
15		0.10	1.43	10.0	X	6.4	9.1	
15		0.03	0.67	0.8	1.7	9.0	"	
Avg.		0.07	0.78	2.7	2.7	7.4	"	
16	F1	0.08	1.29	1.2	1.2	7.6	"	
16		0.05	0.84	0.7	1.3	5.6	"	
16		0.05	0.77	0.3	0.6	6.0	"	
16		0.07	0.92	0.6	0.9	6.5	"	
Avg.		0.06	0.95	0.7	1.0	6.4	"	

TABLE I (Continued)

TEST METHOD 5906 - HORIZONTAL

Part 1 - General Tests - Representative Materials

Material No.	Code	Ignition Time (min.)	Flaming Time (min.)	Burn Length (Measured From Start Wire) (in.)	Burn Rate (Measured From Start Wire) (in./min.)	Burn Rate Initial 1.5 in. (in./roin.)	Burn Rate Final 10 in. (in./min.)	Remarks
17	FI	0.07	0.92	0.4	1.2	2.2	II	
17		0.05	9.25	10.0	X	2.8	1.2	
17		0.05	7.80	9.7	1.4	2.9	II	
17		0.08	0.67	0.2	1.2	3.6	II	
Avg.		0.06	4.70	5.1	1.3	2.9	II	
18	FI	0.10	3.25	10.0	X	6.4	3.4	Light smoke, melts, drips to bottom of cabinet and burns
18		0.05	2.62	10.0	X	5.8	4.3	
18		0.05	2.77	10.0	X	5.3	4.1	
18		0.10	3.13	10.0	X	8.2	3.5	
Avg.		0.08	2.90	10.0	X	6.4	3.8	
19	FI	0.07	2.43	7.0	3.6	3.6	II	Melts, drips to bottom of cabinet and burns
19		0.07	0.48	0.0	I			
19		0.05	2.20	9.5	5.1	5.3	II	
19		0.05	0.70	0.0	I			
Avg.		0.06	1.45	4.1	2.2	4.4	II	
20	FI	0.07	2.62	5.5	2.4	6.9	II	Heavy smoke; acrid odor
20		0.05	2.92	10.0	X	7.5	3.7	
20		0.05	3.30	10.0	X	5.6	3.3	
20		0.03	0.40	0.0	I			
Avg.		0.05	2.30	6.4	2.3	6.7	II	
21	F2	0.05	0.25	0.0	I			Heavy smoke; acrid odor
21		0.03	0.40	0.0	I			
21		0.03	0.40	0.0	I			
21		0.03	0.35	0.0	I			
Avg.		0.04	0.34	0.0	I			
22	F2	0.05	0.35	0.0	I			Heavy smoke; acrid odor
22		0.05	0.37	0.0	I			
22		0.05	0.30	0.0	I			
22		0.05	0.18	0.0	I			
Avg.		0.05	0.30	0.0	I			

TABLE I (Continued)

TEST METHOD 5906 - HORIZONTAL

Part 1 - General Tests - Representative Materials

Material No.	Code	Ignition Time (min.)	Flaming Time (min.)	Burn Length (Measured From Start Wire) (in.)	Burn Rate (Measured From Start Wire) (in./min.)	Burn Rate Initial 1.5 in. (in./min.)	Burn Rate Final 10 in. (in./min.)	Remarks
23	F2	0.05	2.33	10.0	X	5.0	5.0	Heavy smoke; acrid odor
23		0.05	2.43	10.0	X	6.0	4.6	
23		0.05	2.47	10.0	X	5.0	4.6	
Avg.		0.05	2.60	10.0	X	5.3	4.7	
24	F2	0.07	0.50	0.0	I			Heavy smoke; acrid odor
24		0.05	0.43	0.0	I			
24		0.08	0.53	0.0	I			
24		0.07	0.57	0.0	I			
Avg.		0.07	0.51	0.0	I			
25	L1	0.12	1.75	0.0	I			Heavy smoke; acrid odor
25		0.05	2.17	0.0	I			
25		0.05	2.15	0.0	I			
25		0.05	1.75	0.0	I			
Avg.		0.07	2.00	0.0	I			
26	R1	0.10	2.00	0.0	I			
26		0.10	2.00	0.0	I			
26		0.12	1.67	0.0	I			
26		0.12	1.70	0.0	I			
Avg.		0.11	1.8	0.0	I			
27	R2	0.13	14.89	4.0	0.3	0.57	"	Moderate to heavy smoke; pad burns ahead
27		0.10	15.00	6.5	0.5	1.20	"	of nap flame
27		0.13	5.00	1.4	0.4	1.40	"	Test stopped
27		0.12	5.00	1.4	0.4	1.60	"	Test stopped
Avg.		0.12	- -	3.3	0.4	1.19	"	
28	F2	0.05	0.50	0.0	I			
28		0.05	0.50	0.0	I			
28		0.03	0.33	0.0	I			
28		0.03	0.30	0.0	I			
Avg.		0.04	0.41	0.0	I			

TABLE I (Continued)

TEST METHOD 5906 - HORIZONTAL

Part 1 - General Tests - Representative Materials

Material No.	Code	Ignition Time (min.)	Flaming Time (min.)	Burn Length (Measured From Start Wire) (in.)	Burn Rate (Measured From Start Wire) (in./min.)	Burn Rate Initial 1.5 in. (in./min.)	Burn Rate Final 10 in. (in./min.)	Remarks
29	L	0.07	0.75	0.0	I			Heavy smoke
29		0.10	1.27	0.0	I			
29		0.07	0.50	0.0	I			
29		0.05	0.45	0.0	I			
Avg.		0.07	0.74	0.0	I			
30	S3	0.13	5.00	0.0	I			Heavy, sooty smoke
30		0.10	2.00	0.0	I			
30		0.13	2.00	0.0	I			
30		0.12	2.00	0.0	I			
Avg.		0.12	2.80	0.0	I			
31	S3	0.20	4.00	0.0	I			Moderate to heavy smoke
31		0.13	4.00	0.0	I			
31		0.16	2.00	0.0	I			
31		0.15	2.00	0.0	I			
Avg.		0.16	3.00	0.0	I			
32	S3	0.47	2.33	0.0	I			Very heavy smoke
32		0.42	2.00	0.0	I			
32		0.28	2.00	0.0	I			
32		0.22	2.00	0.0	I			
Avg.		0.35	2.10	0.0	I			
33	S3	0.47	2.05	0.0	I	0.9		Very heavy black smoke; burning stopped at 1.5 inches
33		0.13	2.00	0.0	I			
33		0.20	2.00	0.5	0.5	1.9	"	
33		0.15	1.75	0.5	0.5	1.7	"	
Avg.		0.24	2.00	0.3	0.3	1.5	"	
34	S3	0.30	3.00	0.0	I			
34		0.08	1.75	0.0	I			
34		0.05	2.00	0.0	I			
34		0.07	2.00	0.0	I			
Avg.		0.13	2.20	0.0	I			

TABLE I (Continued)

TEST METHOD 5906 - HORIZONTAL

Part 1 - General Tests - Representative Materials

Material No.	Code	Ignition Time (min.)	Flaming Time (min.)	Burn Length (Measured From Start Wire) (in.)	Burn Rate (Measured From Start Wire) (in./min.)	Burn Rate Initial 1.5 in. (in./min.)	Burn Rate Final 10 in. (in./min.)	Remarks
35	S2	0.13	0.59	0.0	I			
35		0.15	0.75	0.0	I			
35		0.13	1.42	0.0	I			
35		0.05	0.85	0.0	I			
Avg.		0.12	0.90	0.0	I			
36	F2	0.07	1.33	0.0	I			
37	F2	0.05	3.48	10.0	X	2.1	3.7	
37		0.05	3.69	10.0	X	2.4	3.3	
Avg.		0.06	3.58	10.0	X	2.3	3.5	
38	F2	0.05	2.37	10.0	X	3.5	5.3	
38		0.05	2.50	10.0	X	3.6	4.9	
Avg.		0.05	2.40	10.0	X	3.5	5.1	
40	F2	0.05	1.87	10.0	X	6.0	6.4	Heavy saoke
40		0.05	1.59	10.0	X	6.4	7.7	
40		0.03	1.69	10.0	X	5.6	7.1	
40		0.05	1.62	10.0	X	7.5	7.3	
Avg.		0.05	1.70	10.0	X	6.4	7.1	
41	R1	0.15	5.92	2.6	0.5	1.4	"	Heavy. sooty slIlOke
41		0.17	7.35	10.0	X	1.4	1.6	
41		0.13	7.47	10.0	X	1.5	1.5	
41		0.13	1.75	0.3	0.5	1.4	"	
Avg.		0.15	5.60	5.7	1.0	1.4	"	
42	F1	0.08	2.08	0.0	I			Light smoke
42		0.08	0.84	0.0	I			
42		0.10	1.03	0.0	I			
42		0.10	1.08	0.0	I			
Avg.		0.09	1.00	0.0	I			

TABLE 1 (Continued)

TEST METHOD 5906 - HORIZONTAL

Part 1 - General Tests - Representative Materials

Material No.	Code	Ignition Time (min.)	Flaming Time (min.)	Burn Length (Measured From Start Wire) (in.)	Burn Rate (Measured From Start Wire) (in./min.)	Burn Rate Initial 1.5 in. (in./min.)	Burn Rate Final 10 in. (in./min.)	Remarks
43	F1	0.07	3.84	10.0	x	3.9	3.0	Moderate gray smoke
43		0.12	3.92	10.0	x	4.6	2.9	
43		0.10	3.67	10.0	x	4.6	3.1	
43		0.12	3.89	10.0	x	4.1	3.0	
Avg.		0.10	3.80	10.0	x	4.3	3.0	
44	F1	0.05	0.52	0.0	I			Heavy black smoke
44		0.05	6.00	10.0	x	2.4	1.9	
44		0.10	0.84	0.0	I			
44		0.07	0.92	0.0	I			
Avg.		0.07	2.10	2.5	0.5	2.4	"	
45	F1	0.10	5.20	10.0	x	6.0	2.1	
45		0.05	5.27	10.0	x	3.5	2.1	
45		0.05	5.28	10.0	x	3.6	2.1	
45		0.05	5.32	10.0	x	3.5	2.1	
Avg.		0.06	5.30	10.0	x	4.1	2.1	
46	F2	0.10	0.84	0.0	I			Moderate BIIlOke
46		0.05	0.92	0.0	I			
46		0.07	0.90	0.0	I			
46		0.07	0.89	0.0	I			
Avg.		0.07	0.89	0.0	I			
47	S1	0.03	0.37	0.0	I	5.0		Burning stopped at 1.5 inches
47		0.03	0.55	0.0	I	8.8		Burning stopped at 1.5 inches
47		0.03	0.57	0.5	1.2	12.5	"	
47		0.03	0.57	0.0	I	7.5		Burning stopped at 1.5 inches
Avg.		0.03	0.52	0.1	0.3	8.7	"	
48	F2	0.05	0.80	0.0	I			
48		0.05	0.87	0.0	I			
48		0.05	0.92	0.0	I			
48		0.05	0.89	0.0	I			
Avg.		0.05	0.87	0.0	I			

TABLE I (Continued)

TEST METHOD 5906 - HORIZONTAL

Part 1 - General Tests - Representative Materials

Material No.	Code	Ignition Time (min.)	Flaming Time (min.)	Burn Length (Measured From Start Wire) (in.)	Burn Rate (Measured From Start Wire) (in./min.)	Burn Rate Initial 1.5 in. (in./min.)	Burn Rate Final 10 in. (in./min.)	Remarks
49	F2	0.05	1.30	1.8	2.2	3.5	"	Heavy smoke
49		0.07	2.64	6.3	2.9	3.6	"	
49		0.07	1.22	1.5	2.0	3.7	"	
49		0.05	3.07	8.4	3.2	3.4	"	
Avg.		0.06	2.10	4.5	2.6	3.5	"	
50	F2	0.05	2.50	3.4	1.7	3.7	"	Heavy gray smoke; acrid odor
50		0.05	3.22	10.4	X	4.7	3.5	
50		0.05	3.94	7.8	2.2	4.7	"	
50		0.05	2.30	3.5	1.8	4.7	"	
Avg.		0.05	3.0	6.2	2.3	4.5	"	
51	F2	0.05	0.28	0.0	I			Light gray smoke
51		0.05	0.30	0.0	I			
51		0.05	0.32	0.0	I			
51		0.05	0.23	0.0	I			
Avg.		0.05	0.28	0.0	I			
52	F2	0.05	0.38	0.0	I			Moderate to heavy smoke
52		0.05	0.38	0.0	I			
52		0.05	0.32	0.0	I			
52		0.05	0.37	0.0	I			
Avg.		0.05	0.36	0.0	I			
53	F2	0.03	0.75	0.0	I -			Moderate gray smoke
53		0.03	0.77	0.0	I			
53		0.03	0.80	0.0	I			
Avg.		0.03	0.77	0.0	I			
54	F2	0.05	0.80	0.0	I			Moderate gray smoke
54		0.03	0.67	0.0	I			
54		0.03	0.84	0.0	I			
54		0.05	0.50	0.0	I			
Avg.		0.04	0.70	0.0	I			

TABLE I (Continued)

TEST METHOD 5906 - HORIZONTAL

Part I - General Tests - Representative Materials

Material No.	Code	Ignition Time (min.)	Flaming Time (min.)	Burn Length (Measured From Start Wire) (in.)	Burn Rate (Measured From Start Wire) (in./min.)	Burn Rate Initial 1.5 in. (in./min.)	Burn Rate Final 10 in. (in./min.)	Remarks
55	F2	0.05	1.75	0.0	I			Heavy gray smoke; acrid odor
55		0.05	1.84	0.0	I			
55		0.05	1.00	0.0	I			
55		0.05	0.92	0.0	I			
Avg.		0.05	1.40	0.0	I			
56	F2	0.03	0.33	0.0	I			
56		0.02	0.28	0.0	I			
56		0.02	0.32	0.0	I			
56		0.02	0.27	0.0	I			
Avg.		0.02	0.30	0.0	I			
57	LI	0.03	0.33	0.0	I			Moderate gray smoke; acrid odor; mylar melts
57		0.03	0.35	0.0	I			
57		0.03	0.33	0.0	I			
57		0.03	0.30	0.0	I			
Avg.		0.03	0.33	0.0	I			
58	L2	0.02	0.42	0.0	I			Melts
58		0.03	0.42	0.0	I			
58		0.03	0.43	0.0	I			
58		0.03	0.45	0.0	I			
Avg.		0.03	0.43	0.0	I			
59	L2	0.03	0.59	0.0	I			Moderate gray smoke; acrid odor; melts and flashes
59		0.03	0.62	0.0	I			
59		0.03	0.65	0.0	I			
59		0.03	0.69	0.0	I			
Avg.		0.03	0.64	0.0	I			
60	F2	0.03	0.75	0.0	I			Light smoke; acrid odor
60		0.03	0.59	0.0	I			
60		0.05	0.75	0.0	I			
60		0.03	0.79	0.0	I			
Avg.		0.04	0.72	0.0	I			

TABLE I (Continued)

TEST METHOD 5906 - **HORIZONTAL**

Part 1 - General Tests - Representative Materials

Material No.	Code	Ignition Time (min.)	Flaming Time (min.)	Burn Length (Measured From Start Wire) (in.)	Burn Rate (Measured From Start Wire) (in./min.)	Burn Rote Initial 1.5 in. (in./min.)	Burn Rote Final 10 in. (in./min.)	Remarks
61	F2	0.03	0.17	0.0	I			No smoke
61		0.03	0.35	0.0	I			
61		0.02	0.32	0.0	I			
61		0.03	0.33	0.0	I			
Avg.		0.03	0.27	0.0	I			
62	F2	0.03	0.33	0.0	I			No smoke; melts
62		0.03	0.18	0.0	I			
62		0.03	0.33	0.0	I			
Avg.		0.03	0.28	0.0	I			
63	F2	0.02	0.07	0.0	I			Melts
63		0.03	0.23	0.0	I			
63		0.03	0.28	0.0	I			
63		0.03	0.53	0.0	I			
Avg.		0.03	0.28	0.0	I			
64	F2	0.02	0.57	1.0	2.5	10.0	II	Light gray smoke; acrid odor
64		0.02	0.48	0.9	2.7	11.5	II	
64		0.03	0.62	0.7	1.6	10.7	II	
64		0.03	0.40	0.7	2.8	12.5	II	
Avg.		0.03	0.52	0.8	2.4	10.7	II	
65	F2	0.05	1.00	0.0	I			Moderate gray smoke
65		0.07	1.08	0.0	I			
65		0.07	1.08	0.0	I			
65		0.07	1.33	0.0	I			
Avg.		0.07	1.10	0.0	I			
66	S1	0.02	0.50	0.0	I			Bluish smoke; acrid odor
66		0.02	0.40	0.0	I			
66		0.02	0.47	0.0	I			
66		0.02	0.42	0.0	I			
Avg.		0.02	0.45	0.0	I			

TABLE I (Continued)

TEST METHOD 5906 - HORIZONTAL

Part 1 - General Tests - Representative Materials

Material No.	Code	Ignition Time (min.)	Flaming Time (min.)	Burn Length (Measured From Start Wire) (in.)	Burn Rate (Measured From Start Wire) (in./min.)	Burn Rate Initial 1.5 in. (in./min.)	Burn Rate Final 10 in. (in./min.)	Remarks
67	F3	0.33	7.92	6.8	1.0	1.4	"	Moderate light gray smoke; very foul odor
67		0.17	1.05	0.0	I			
67		0.17	1.45	0.0	I	1.4		Burning stopped at 1.5 inches
67		0.12	2.17	0.3	0.3	1.6	"	
Avg.		0.20	3.15	1.8	0.3	1.4	"	
68	S1	0.03	0.75	0.0	I			Light to moderate smoke; sponge melts
68		0.05	0.62	0.0	I			
68		0.05	0.60	0.0	I			
68		0.07	0.64	0.0	I			
Avg.		0.05	0.65	0.0	I			
69	S2	0.00	0.00	0.0	I			Heavy blue-gray smoke
69		0.00	0.00	0.0	I			
69		0.00	0.00	0.0	I			
69		0.00	0.00	0.0	I			
Avg.		0.00	0.00	0.0	I			
70	F1	0.05	0.33	0.0	I			
70		0.05	0.33	0.0	I			
70		0.03	0.32	0.0	I			
70		0.05	0.25	0.0	I			
Avg.		0.05	0.30	0.0	I			
76	A	0.07	5.00	0.0	I			Moderate heavy smoke; acrid odor
76		0.08	5.00	0.0	I			
Avg.		0.08	5.00	0.0	I			
77	S3	0.17	2.75	1.9	1.3	1.4	"	Test stopped. Drips, burns
77		0.20	4.62	2.7	1.1	0.8	"	
Avg.		0.19	- -	2.3	1.2	1.1	"	
80	A	0.13	1.50	0.0	I			

TABLE I (Continued)

TEST **METHOD** 5906 - HORIZONTAL

Part 1 - General Tests - Representative Materials

Material No.	Code	Ignition Time (min.)	Flaming Time (min.)	Burn Length (Measured From Start Wire) (in.)	Burn Rate (Measured From Start Wire) (in./min.)	Burn Rate Initial 1.5 in. (in./min.)	Burn Rate Final 10 in. (in./min.)	Remarks
81	A	0.33	2.00	0.0	I			
82	A	1.03	2.50	0.0	I			
83	A	0.10	2.30	0.0	I			
84	A	0.12	1.17	0.0	I			**Light** gray smoke
85	L3	0.00	0.00	0.0	I			
86	L3	0.00	0.00	0.0	I			
87	L3	0.00	0.00	0.0	I			
88	L3	0.00	0.00	0.0	I			
89	F3	0.07	1.92	0.8	1.4		II	
89		0.07	0.92	0.0	I			
Avg.		0.07	1.40	0.4	0.7		II	
91	Sl	0.02	2.23	10.0	X	4.7	5.2	Heavy smoke; acrid odor
92	F2	0.05	0.75	0.0	I			Very heavy smoke; acrid odor
92		0.05	0.75	0.0	I			
92		0.07	0.70	0.0	I			
92		0.05	0.64	0.0	I			
Avg.		0.05	0.71	0.0	I			

TABLE I (Continued)

TEST METHOD 5906 - HORIZONTAL

Part 1 - General Tests - Representative Materials

Material No.	Code	Ignition Time (min.)	Flaming Time (min.)	Burn Length (Measured From Start Wire) (in.)	Burn Rate (Measured From Start Wire) (in./min.)	Burn Rate Initial 1.5 in. (in./min.)	Burn Rate Final 10 in. (in./min.)	Remarks
93	F2	0.07	1.03	0.0	I			Very heavy gray smoke
93		0.05	1.08	0.0	I			
93		0.05	0.92	0.0	I			
93		0.07	0.95	0.0	I			
Avg.		0.06	1.00	0.0	I			
94	F2	0.05	1.20	0.0	I			Heavy gray smoke; acrid odor
94		0.07	1.22	0.0	I			
94		0.07	1.30	0.0	I			
94		0.07	1.08	0.0	I			
Avg.		0.07	1.20	0.0	I			
95	51	0.02	0.23	0.0	I			Very acrid odor
95		0.03	0.27	0.0	I			
Avg.		0.03	0.25	0.0	I			
96	51	0.02	0.84	0.0	I			
96		0.02	0.59	0.0	I			
96		0.02	0.75	0.0	I			
96		0.02	0.59	0.0	I			
Avg.		0.02	0.69	0.0	I			
97	51	0.02	0.87	0.0	I			
97		0.02	0.75	0.0	I			
97		0.02	0.72	0.0	I			
97		0.02	0.75	0.0	I			
Avg.		0.02	0.77	0.0	I			
98	51	0.02	0.62	0.0	I			
98		0.02	0.59	0.0	I			
98		0.02	0.84	0.0	I			
98		0.02	0.85	0.0	I			
Avg.		0.02	0.73	0.0				

TABLE I (Continued)

TEST METHOD 5906 - HORIZONTAL

Part 1 - General Tests - Representative Materials

Material No.	Code	Ignition TiMe (min.)	Flaming Time (min.)	Burn Length (Neasured From Start Wire) (in.)	Burn Rate (Measured From Start Wire) (in./min.)	Burn Rate Initial 1.5 in. (in./min.)	Final lOin. (in./min.)	Remarks
99	R2	0.07	3.25	0.5	0.3	0.9	"	Pad burns more than nap
99		0.07	2.92	0.0	I			
Avg.		0.07	3.09	0.3	0.2	0.9	"	
100	Rl	0.07	1.50	0.0	I			
100		0.07	1.33	0.0	I			
Avg.		0.07	1.42	0.0	I			
107	Sl	0.03	0.59	0.0	I			Heavy smoke; acrid odor
108	Sl	0.03	0.13	0.0	I			Heavy, sooty smoke; acrid odor

TABLE I

TEST METHOD 5906 - HORIZONTAL

Part 2 - Special Tests - New, Used and Cleaned Materials

Material No.	Code	Ignition Time (min.)	Flaming Time (min.)	Burn Length (Measured From Start Wire) (in.)	Burn Rate (Measured From Start Wire) (in./min.)	Burn Rate Initial 1.5 in. (in./min.)	Burn Rate Final 10 in. (in./min.)	Remarks
13N	Fl	0.07	7.12	10.0	X	3.3	1.5	Light smoke
13N		0.07	6.75	10.0	X	2.9	1.6	
Avg.		0.07	6.93	10.0	X	3.1	1.5	
13NC	Fl	0.05	6.72	10.0	X	2.3	1.7	Light smoke
13NC		0.05	6.59	10.0	X	2.4	1.7	
Avg.		0.05	6.65	10.0	X	2.3	1.7	
13U	Fl	0.07	6.25	10.0	X	3.1	1.7	Light smoke
13U		0.07	7.03	10.0	X	3.0	1.5	
Avg.		0.07	6.64	10.0	X	3.1	1.6	
13UC	Fl	0.07	6.92	10.0	X	3.3	1.6	Light smoke
13UC		0.07	7.20	10.0	X	3.1	1.5	
Avg.		0.07	7.06	10.0	X	3.2	1.5	
18N	Fl	0.07	2.18	10.0	X	5.8	5.4	
18N		0.05	2.17	10.0	X	5.4	5.4	
Avg.		0.06	2.18	10.0	X	5.6	5.4	
18NC	Fl	0.07	2.07	10.0	X	7.1	5.6	
18NC		0.07	2.03	10.0	X	7.1	5.7	
Avg.		0.07	2.05	10.0	X	7.1	5.7	
18U	Fl	0.07	2.05	10.0	X	7.1	5.6	
18U		0.07	2.37	10.0	X	3.9	5.2	
Avg.		0.07	2.21	10.0	X	5.5	5.4	
18UC	Fl	0.05	1.72	10.0	X	6.5	6.9	
18UC		0.05	1.99	10.0	X	6.8	5.8	
Avg.		0.05	1.85	10.0	X	6.6	6.3	

TABLE I (Continued)

TEST METHOD 5906" - HORIZONTAL

Part 2 - Special Tests - New, Used and Cleaned Materials

Material No.	Code	Ignition Time (min.)	Flaming Time (min.)	Burn Length (Measured From Start Wire) (in.)	Burn Rate (Measured From Start Wire) (in./min.)	Burn Rate Initial 1.5 in. (in./min.)	Burn Rate Final 10 in. (in./min.)	Remarks
19N	Fl	0.07	0.20	0.0	I			Light smoke; melts, drips to bottom of cabinet and burns
19N		0.07	0.13	0.0	I			
Avg.		0.07	0.17	0.0	I			
19NC	Fl	0.07	2.89	10.0	X	6.8	3.8	
19NC		0.07	3.17	10.0	X	5.4	3.5	
Avg.		0.07	3.03	10.0	X	6.1	3.6	
19U	Fl	0.05	0.32	0.0	I			
19U		0.05	2.22	10.0	X	3.3	5.8	
A-lg.		0.05	1.27	5.0	2.9	3.3	"	
19UC	Fl	0.05	2.48	10.0	X	6.8	4.7	
19UC		0.05	2.08	10.0	X	6.5	5.6	
Avg.		0.05	2.28	10.0	X	6.6	5.2	
20N	Fl	0.07	2.77	10.0	X	4.5	4.2	Light smoke; melts, drips to bottom of cabinet and burns
20N		0.05	3.25	10.0	X	3.8	3.6	
Avg.		0.06	3.01	10.0	X	4.1	3.9	
20NC	Fl	0.05	3.08	10.0	X	4.7	3.7	
20NC		0.07	3.43	10.0	X	5.0	3.3	
Avg.		0.06	3.25	10.0	X	4.8	3.5	
20U	Fl	0.05	0.42	0.0	I			
20U		0.05	0.25	0.0	I			
Avg.		0.05	0.34	0.0	I			
20UC	Fl	0.05	0.59	0.2	1.0	4.5	"	
20UC		0.05	2.38	6.5	3.6	2.9	"	
Avg.		0.05	1.98	3.4	2.3	3.1	"	

TABLE I (Continued)

TEST METHOD 5906 - HORIZONTAL

Part 2 - Special Tests - New, Used and Cleaned Materials

Material No.	Code	Ignition Time (min.)	Flaming Time (min.)	Burn Length (Measured From Start Wire) (in.)	Burn Rate (Measured From Start Wire) (in./min.)	Burn Rate Initial 1.5 in. (in./min.)	Final 10 in. (in./min.)	Remarks
2iNC	R2	0.07	4.00	0.0	I			Test stopped
27NC		0.07	4.00	0.0	I			
Avg.		0.07	4.00	0.0	I			
27U	R2	0.07	9.00	3.5	0.5	0.7	II	Test stopped
27U		0.07	5.00	0.5	0.2	0.7	II	Note 2
Avg.		0.07	7.00	2.0	0.4	0.7	II	
27UC	RZ	0.08	6.00	1.0	0.3	0.6	II	Test stopped
27UC		0.08	5.00	1.0	0.4	0.6	II	
Avg.		0.08	5.50	1.0	0.4	0.6	II	
99N	R2	0.07	3.25	0.5	1.1	0.5	II	
99N		0.07	2.92	0.0	I			Note 3
AVL.		0.07	3.08	0.3	0.6	0.3	II	
99NC	R2	0.07	3.33	0.0	I			Test stopped
99NC		0.07	3.33	0.0	I			
Avg.		0.07	3.33	0.0	I			
99U	R2	0.08	4.25	0.0	I			
99U		0.08	4.84	0.0	I			
Avg.		0.08	4.54	0.0	I			
99UC	R2	0.08	4.35	0.5	0.5	0.5	II	
99UC		0.08	6.59	1.5	0.5	0.5	II	
Avg.		0.08	5.17	1.0	0.5	0.5	II	

TABLE I (Continued)

TEST METHOD 5906 - HORIZONTAL

Part 2 - Special Tests - New, Used and Cleaned Materials

Material No.	Code	Ignition Time (min.)	Flaming Time (min.)	Burn Length (Measured From Start Wire) (in.)	Burn Rate (Heasured From Start Wire) (in./min.)	Burn Rate Initial 1.5 in. (in./min.)	Burn Rate Final 10 in. (in./min.)	Remarks
lOON	Rl	0.07	1.SO	0.0	I			Note 3
lOON	Rl	0.07	1.33	0.0	I			Note 3
Avg.		0.07	1.42	0.0	I			
100NC	Rl	0.08	1.SO	0.0	I			Note 3
100NC		0.08	1.59	0.0	I			Note 3
Avg.		0.08	1.54	0.0	I			
100U	Rl	0.08	2.00	0.0	I			Note 3
100U		0.08	2.00	0.0	I			Note 3
Avg.		0.08	2.00	0.0	I			
lOOUC	Rl	0.07	2.00	0.0	I			Note 3
lOOUC		0.07	1.45	0.0	I			
Avg.		0.07	1.72	0.0	I			

Note 1: Letters after material no. signify: N - New; NC - New and Cleaned; U - Used; UC - Used and Cleaned.

Note 2: Test conducted with 0.042" aluminum sheet on top of pad which stopped hurning.

Note 3: Material burned only in area of test flame.

I Burned less than 1.5 inches (start wire)
II Burned less than 11.5 inches (stop wire)
X Burned full length

TABLE II

TEST METHOD FSS RELEASE 453

General Tests - Representative Materials

Material No.	Code	Ignition Time (min.)	Flaming Time (Measured After 15 sec. Burner Removal) (min.)	Burn Length (Measured From Start Wire) (in.)	Burn Rate (Measured From Start Wire) (in./min.)	Burn Rate Initial 1.5 in. (in./min.)	Burn Rate Final 10 in. (in./min.)	Remarks
13	Fl	0.03	7.03	10.0	X	2.3	1.5	
13		0.05	2.52	2.9	1.3	2.6	"	
Avg.		0.04	4.77	6.5	1.4	2.4	"	
14	Fl	0.07	5.53	10.0	X	2.9	1.9	
14		0.07	5.05	10.0	X	3.2	2.1	
Avg.		0.07	5.29	10.0	X	3.1	2.0	
15	Fl	0.05	1.47	10.0	X	4.5	7.5	
15		0.05	1.32	3.0	2.4	6.0	"	
15		0.05	0.77	1.0	1.4	4.5	"	
15		0.05	1.98	8.6	4.8	9.0	"	
Avg.		0.05	1.38	5.7	4.0	6.0	"	
16	Fl	0.05	0.65	0.5	0.9	5.6	"	
16		0.05	0.45	0.1	I			
16		0.05	0.52	0.0	I			
16		0.03	0.72	0.9	1.5	4.5	"	
Avg.		0.05	0.59	0.5	0.6	5.0	"	
17	Fl	0.07	0.48	0.0	I			
17		0.07	0.45	0.0	I			
17		0.07	0.45	0.0	I			
17		0.07	0.48	0.0	I			
Avg.		0.07	0.47	0.0	I			
18	Fl	0.08	2.59	10.0	X	4.5	4.1	
18		0.13	2.63	10.0	X	4.5	4.1	
18		0.08	3.02	10.0	X	4.3	3.5	
18		0.07	3.28	10.0	X	4.3	3.2	
Avg.		0.08	2.83	10.0	X	4.4	3.7	
19	Fl	0.07	0.30	0.0	0.0	9.0	"	
19		0.07	2.74	10.0	X	7.0	3.7	
19		0.07	2.50	4.0	2.2	1.8	"	
19		0.07	2.50	3.0	1.3	4.5	"	
Avg.		0.07	2.02	4.2	1.8	5.6	"	

TABLE II (Continued)

TEST METHOD FSS RELEASE 453

General Tests - Representative Materials

Material No.	Code	Ignition Time (min.)	Flaming Time (Measured After 15 sec. Burner Removal) (min.)	Burn Length (Measured From Start Wire) (in.)	Burn Rate (Measured From Start Wire) (in./min.)	Burn Rate Initial 1.5 in. (in./min.)	Burn Rate Final 10 in. (in./", in.)	Remarks
20	F1	0.05	3.33	10.0	X	6.9	3.0	
20		0.05	0.48	0.3	1.3	3.3	"	
20		0.05	0.00	0.0	I			
20		0.05	2.69	6.0	2.6	2.8	"	
Avg.		0.05	1.62	4.1	1.7	4.3	"	
23	F2	0.05	2.10	10.0	X	3.2	5.1	
23		0.03	2.10	10.0	X	4.7	5.0	
23		0.03	2.18	10.0	X	5.0	5.1	
Avg.		0.04	2.12	10.0	X	4.3	5.0	
27	R2	0.07	1.25	0.0	I			
27		0.07	2.1,5	0.0	I			
27		0.05	1.92	0.0	I			
27		0.05	2.42	0.0	I			
Avg.		0.06	2.01	0.0	I			
33	S3	0.12	0.03	0.0	I			
33		0.10	0.00	0.0	I			
33		0.10	0.00	0.0	I			
33		0.10	0.00	0.0	I			
Avg.		0.10	0.01	0.0	I			
37	F2	0.05	3.52	10.0	X	2.0	3.4	
37		0.05	3.35	10.0	X	2.0	3.5	
Avg.		0.05	3.43	10.0	X	2.0	3.5	
38	F2	0.03	2.95	10.0	X	3.0	3.7	
38		0.05	2.82	10.0	X	3.1	3.9	
Avg.		0.04	2.89	10.0	X	3.1	3.8	
40	F2	0.05	1.70	10.0	X	6.9	5.9	
41	R1	0.12	1.97	0.0	I			
41		0.12	2.10	0.0	I			
41		0.12	2.32	0.0	I			
Avg.		0.12	2.13	0.0	I			

TABLE II (Continued)

TEST METHOD FSS RELEASE 453

General Tests - Representative Materials

Material No.	Code	Ignition Time (min.)	Flaming Time (Measured After 15 sec. Burner Removal) (min.)	Burn Length (Heasured From Start Wire) (in.)	Burn Rate (Measured From Start Wire) (in./min.)	Bunl Rate Initial 1.5 in. (in./min.)	Bunl Rate Final lOin. (ill./min.)	Remarks
42	Fl	0.07	0.59	0.0	I			
42		0.10	0.55	0.0	I			
42		0.12	0.43	0.0	I			
42		1.10	0.59	0.0	I			
Avg.		0.35	0.54	0.0	I			
43	Fl	0.07	4.08	10.0	X	3.6	2.6	
43		0.07	4.07	10.0	X	3.3	2.6	
43		0.07	4.20	10.0	X	2.6	2.6	
43		0.07	4.13	10.0	X	3.8	2.6	
Avg.		0.07	4.11	10.0	X	3.6	2.6	
44	Fl	0.07	1.33	0.8	1.5	1.7	"	
44		0.07	0.33	0.0	I			
44		0.07	2.55	1.8	1.0	1.6	"	
Avg.		0.07	1.48	0.9	0.8	1.1	"	
45	Fl	0.05	5.07	10.0	X	2.7	2.1	
45		0.05	5.42	10.0	X	2.6	2.0	
Avg.		0.05	5.24	10.0	X	2.7	2.1	
49	F2	0.07	0.55	0.2	0.9	3.0	"	
49		0.07	0.42	0.2	5.0	2.6	"	
Avg.		0.07	0.49	0.2	3.0	2.6	"	
50	F2	0.07	0.87	0.8	2.4	2.1	"	
50		0.07	0.13	0.0	I			
50		0.07	1.10	0.8	0.9	3.7	"	
50		0.07	1.33	1.5	1.4	3.5	"	
Avg.		0.07	0.86	0.8	1.2	3.1	"	
64	F2	0.03	0.25	1.2	3.6	11.3	"	
64		0.02	0.00	0.7	8.4	10.1	"	
64		0.02	0.00	0.0	I			
64		0.02	0.25	1.8	5.4	10.1	"	
Avg.		0.02	0.13	0.9	4.4	10.1	"	

TABLE II (Continued)

TEST METHOD FSS RELEASE 453

General Tests - Representative Materials

Material No.	Code	Ignition Time (min.)	Flaming Time (Measured After 15 sec. Burner Removal) (Olin.)	Burn Length (Measured From Start Wire) (in.)	Burn Rate (Measured From Start Wire) (1n./min.)	Initial 1.5 in. (in./min.)	Final 10 in. (1n./min.)	Remarks
67	F3	0.08	0.00	0.0	I			
67		0.05	0.03	0.0	I			
67		0.05	0.07	0.0	I			
67		0.05	0.59	0.0	I			
Avg.		0.06	0.17	0.0	I			
89	F3	0.07	0.03	0.0	I			
89		0.07	0.03	0.0	I			
89		0.07	0.02	0.0	I			
89		0.07	0.05	0.0	I			
Avg.		0.07	0.03	0.0	I			

I Burned less than 1.5 inches (start wire)
II Burned less than 11.5 inches (stop wire)
X Burned full length

TABLE III (Continued)

TEST **METHOD** 5902 - **VERTICAL**

Part 1 - General Tests - Representative Materials

Material No.	Code	Ignition Time (min.)	Flaming Time (Measured After 12 sec. Burner Removal) (min.)	Glow Time (Measured After Flameout) (min.)	Burn Length (in.)	Char Length (in.)	Burn Rate (12 sec. Burner Time Included) 0-12 in. (in./min.)	12 in. (in./min.)	Remarks
11	S3	0.03	0.37		3.0	1.5	5.6	1	
12	R1	0.07	4.78		12.0	12.0	X	2.4	
12		0.05	3.84		12.0	12.0	X	3.0	
Avg.		0.06	4.31		12.0	12.0	X	2.7	
13	FI	0.05	2.75		12.0	12.0	X	4.1	
13		0.05	1.77		12.0	12.0	X	6.3	
13		0.05	1.30		12.0	12.0	X	8.3	
13		0.05	1.69		12.0	12.0	X	6.5	
Avg.		0.05	1.88		12.0	12.0	X	6.4	
14	F1	0.05	1.18		12.0	12.0	X	9.0	
14		0.05	1.07		12.0	12.0	X	9.9	
14		0.05	1.12		12.0	12.0	X	9.5	
14		0.05	1.08		12.0	12.0	X	9.7	
Avg.		0.05	1.11		12.0	12.0	X	9.5	
15	F1	0.05	0.69		9.2	7.5	11.0	1	
15		0.07	0.75		7.5	4.6	8.5	I	
15		0.05	0.42		8.0	11.5	14.1	I	
15		0.05	0.87		8.0	9.0	7.9	I	
Avg.		0.05	0.68		8.2	8.1	10.4	I	
16	FI	0.03	0.45		7.0	3.0	11.3	1	
16		0.05	0.55		1.8	5.5	2.6	1	
16		0.03	0.38		5.0	6.5	9.1	1	
16		0.03	0.57		1.0	5.0	1.4	1	
Avg.		0.03	0.49		3.7	5.0	6.1	I	
17	F1	0.05	1.13		12.0	12.0	X	9.4	
17		0.05	1.10		12.0	12.0	X	9.6	
17		0.05	1.13		12.0	12.0	X	9.4	
17		0.05	0.99		12.0	12.0	X	10.6	
Avg.		0.05	1.09		12.0	12.0	X	9.8	

TABLE III (Continued)

TEST METHOD 5902 - VERTICAL

Part 1 - General Tests - Representative Materials

Material No.	Code	Ignition Time (min.)	Flaming Time (Measured After 12 sec. Burner Removal) (min.)	Glow Time (Measured After Flameout) (min.)	Burn Length (in.)	Char Length (in.)	Burn Rate (12 sec. Burner Time Included) 0-12 in. (in./min.)	Burn Rate (12 sec. Burner Time Included) 12 in. (in./min.)	Remarks
18	FI	0.07	1.70		12.0	12.0	X	6.5	Melts, drips to bottom of cabinet and burns
18		0.03	1.30		12.0	12.0	X	8.2	
18		0.03	1.45		12.0	12.0	X	7.4	
Avg.		0.04	1.1,8		12.0	12.0	X	7.4	
19	FI	0.08	1.42		8.0	8.3	5.2	I	Melts, drips to bottom of cabinet and burns
19		0.07	0.99		7.7	7.8	6.9	I	
19		0.03	2.08		12.0	12.0	X	5.3	
19		0.05	1.10		7.5	8.1	6.0	I	
Avg.		0.06	2.08		8.8	9.0	5.9	1	
20	FI	0.05	0.65		6.2	6.2	7.7	I	
20		0.05	0.38		7.7	7.7	14.4	I	
20		0.05	1.10		8.3	8.3	6.6	I	
20		0.05	0.59		5.4	5.4	7.3	I	
Avg.		0.05	0.68		6.9	6.9	9.0	I	
21	F2	0.05	0.15		3.5	2.8	11.7	I	Sooty smoke;acrid odor
21		0.03	0.08		3.5	2.8	14.0	I	
21		0.03	0.00		3.0	2.6	18.0	I	
21		0.03	0.00		3.8	3.1	22.8	I	
Avs.		0.04	0.06		3.4	2.8	16.6	I	
22	F2	0.03	0.00		7.0	1.0	41.9	I	Heavy, sooty smoke; acrid odor
22		0.03	0.00	0.50	2.8	1.2	16.8	I	
22		0.05	0.00		2.6	1.0	17.3	I	
22		0.05	0.00		3.0	1.1	18.0	I	
Avg.		0.04	0.00		3.9	1.1	23.5	I	
23	F2	0.05	0.78		11.0	9.5	11.8	I	Heavy, sooty smoke; acrid odor
23		0.03	1.17		12.0	12.0	X	9.0	
23		0.03	1.08		12.0	12.0	X	9.6	
23		0.03	0.84		12.0	12.0	X	12.0	
Avs.		0.04	1.03		U.B	11.4	10.6	I	

TABLE III (Continued)

TEST METHOD 5902 - VERTICAL

Part 1 - General Tests - Representative Materials

Material No.	Code	Ignition Time (min.)	Flaming Time (Measured After 12 sec. Burner Removal) (min.)	(Measured After Flameout) (min.)	Burn Length (in.)	Char Length (in.)	Burn Rate (12 sec. Burner Time Included) 0-12 in. (in./min.)	12 in. (in./min.)	Remarks
24	F2	0.03	0.00		3.8	2.5	22.8	I	
24		0.03	0.00		2.5	2.0	15.0	I	
24		0.03	0.00		3.0	3.0	18.0	I	
24		0.03	0.00		3.2	3.4	19.2	I	
Avg.		0.03	0.00		3.1	2.7	18.8	I	
25	L1	0.05	0.07		0.0	0.0	0.0	I	
25		0.05	0.89		1.5	0.0	1.4	I	
Avg.		0.05	0.48		0.8	0.0	0.8	I	
25		0.05	0.15		2.0	0.0	6.7	I	No. 25 specimen without pad backing
26	R1	C.07	3.72		12.0	12.0	X	3.1	Heavy smoke
26		0.05	3.92		12.0	12.0	X	2.9	
26		0.05	3.74		12.0	12.0	X	3.1	
26		0.07	3.59		12.0	12.0	X	3.2	
Avg.		0.06	3.74		12.0	12.0	X	3.1	
27	R2	0.10	6.12		12.0	12.0	X	1.9	
27		0.10	5.72		12.0	12.0	X	2.1	
27		0.07	6.25		12.0	12.0	X	1.9	
27		0.07	6.55		12.0	12.0	X	1.8	
Avg.		0.08	6.16		12.0	12.0	X	1.9	
28	F2	0.05	0.00		2.3	1.0	15.3	I	
28		0.05	0.00	0.20	1.9	0.4	12.7	I	
28		0.05	0.00	0.03	2.7	1.3	18.0	I	
28		0.05	0.00		2.0	0.5	13.3	I	
Avg.		0.05	0.00		1.6	0.8	14.8	I	
29	L1	0.05	0.00	0.08	2.0	0.0	13.3	I	
29		0.05	0.00	0.12	4.0	0.0	26.6	I	
29		0.05	0.00	0.10	3.5	0.0	23.3	I	
29		0.05	0.00	0.12	3.0	0.0	20.0	I	
Avg.		0.05	0.00	0.11	3.1	0.0	20.8	I	

TABLE III (Continued)

TEST METHOD 5902 - VERTICAL

Part 1 - General Tests - Reprcsentative Materials

Material No.	Code	Ignition Timc (min.)	Flaming Time (Measured After 12 sec. Burner Removal) (min.)	Glow Time (l1easured After Flameout) (min.)	Ilurn Length (in.)	Char Length (in.)	Burn Rate (12 sec. Burner Time Includc·l) 0-12 in. (in.loin.)	Burn Rate (12 sec. Burner Time Includc·l) 12 in. (in./min.)	Remarks
30	S3	0.05	0.00		0.0	0.0		I	
30		0.05	0.00		0.0	0.0		I	
30		0.05	0.00		0.0	0.0		I	
30		0.05	0.00		0.0	0.0		I	
Avg.		0.05	0.00		0.0	0.0		I	
31	S3	0.03	0.00		0.0	0.0		I	
31		0.03	0.00		0.0	0.0		I	
31		0.03	0.00		0.0	0.0		I	
31		0.03	0.00		0.0	0.0		I	
Avg.		0.03	0.00		0.0	0.0		I	
32	S3	0.05	3.45		12.0	12.0	X	3.3	
32		0.05	4.25		12.0	12.0	X	2.6	
32		0.05	4.43		12.0	12.0	X	2.6	
32		0.05	4.55		12.0	12.0	X	2.6	
Avg.		0.05	4.17		12.0	12.0	X	2.8	
33	S3	0.05	0.00		0.0	0.0	0.0	I	Very black 91DOke
33		0.03	2.84		12.0	12.0	X	4.0	
33		0.05	3.42		12.0	12.0	X	3.4	
33		0.05	2.67		12.0	12.0	X	4.3	
Avg.		0.05	2.97		12.0	12.0	X	3.9	
34	S3	0.03	0.00		1.1	0.0	6.6	I	
34		0.03	0.00		1.0	0.0	6.0	I	
34		0.03	0.00		1.0	0.0	6.0	I	
34		0.03	0.00		1.2	0.0	7.2	I	
Avg.		0.03	0.00		1.1	0.0	6.5	I	
35	S2	0.03	0.22		3.0	2.5	8.0	I	
35		0.03	2.07		12.0	12.0	X	5.4	
35		0.03	1.85		12.0	12.0	X	5.9	
35		0.03	1.85		12.0	12.0	X	5.9	
Avg.		0.03	1.90		9.8	9.6	6.3	I	
36	F2	0.03	2.55		12.0	12.0	X	4.4	

TABLE III (Continued)

TEST **METHOD** 5902 - **VERTICAL**

Part 1 - General Tests - Representative Materials

Material No.	Code	**Ignition** Time (min.)	**Flaming Time** (Measured After 12 sec. Burner Removal) (min.)	**Glow** Time (Measured After Flameout) (min.)	Burn Length (in.)	Char Length (in.)	Burn Rate (12 sec. Burner Time Included) 0-12 in. (in./min.)	12 in. (in./min.)	Remarks
37	F2	0.03	1.27		12.0	12.0	X	8.4	
37		0.05	1.89		12.0	12.0	X	5.9	
Avg.		0.04	1.58		12.0	12.0	X	7.1	
38	F2	0.03	1.05		12.0	12.0	X	9.9	
38		0.03	0.95		12.0	12.0	X	10.7	
Avg.		0.03	1.00		12.0	12.0	X	10.3	
40	F2	0.03	0.70		12.0	12.0	X	13.8	
40		0.03	0.43		12.0	12.0	X	20.0	
40		0.03	0.42		12.0	12.0	X	20.5	
40		0.03	0.38		12.0	12.0	X	21.8	
Avg.		0.03	0.48		12.0	12.0	X	19.0	
41	R1	0.07	3.37		12.0	12.0	X	3.4	Heavy smoke
41		0.05	3.78		12.0	12.0	X	3.1	
41		0.07	3.22		12.0	12.0	X	3.6	
41		0.05	3.87		12.0	12.0	X	3.0	
Avg.		0.06	3.56		12.0	12.0	X	3.3	
42	F1	0.03	1.62		12.0	12.0	X	6.7	Heavy, black smoke
42		0.03	1.37		12.0	12.0	X	7.8	
42		0.03	1.62		12.0	12.0	X	6.7	
42		0.03	1.74		12.0	12.0	X	6.3	
Avg.		0.03	1.59		12.0	12.0	X	6.9	
43	F1	0.03	0.72		12.0	12.0	X	13.6	Moderate, blue-black smoke
43		0.05	0.74		12.0	12.0	X	13.6	
43		0.03	0.78		12.0	12.0	X	12.6	
43		0.03	0.84		12.0	12.0	X	12.6	
Avg.		0.03	0.77		12.0	12.0	X	13.1	
44	F1	0.05	0.75		10.0	6.6	11.1	I	
44		0.05	0.92		10.0	9.5	9.4	1	
44		0.05	1.10		10.5	9.5	8.0	I	
44		0.05	0.72		11.0	11.8	12.7	1	
Avg.		0.05	0.87		10.4	9.6	10.3	I	

TABLE III (Continued)

TEST METHOD 5902 - VERTICAL

Part 1 - General Tests - Representative Materials

Material No.	Code	Ignition Time (min.)	Flaming Time (Measured After 12 sec. Burner Removal) (min.)	Glow Time (Measured After Flameout) (min.)	Burn Length (in.)	Char Length (in.)	Burn Rate (12 sec. Burner Time Included) 0-12 in. (in./min.)	Burn Rate (12 sec. Burner Time Included) 12 in. (in./min.)	Remarks
45	F1	0.05	1.28		12.0	12.0	X	8.4	
45		0.03	2.28		12.0	12.0	X	4.9	
45		0.03	1.25		12.0	12.0	X	8.5	
45		0.03	1.35		12.0	12.0	X	7.9	
Avg.		0.03	1.54		12.0	12.0	X	7.4	
46	F2	0.05	0.07		1.8	1.0	8.3	I	
46		0.07	0.23		2.5	2.2	6.8	I	
46		0.05	0.00		1.7	0.7	11.3	I	
46		0.05	0.00		1.6	0.2	10.6	I	
Avg.		0.06	0.08		1.9	1.0	9.2	I	
47	S1	0.03	0.64		12.0	12.0	X	15.0	Heavy, black smoke
47		0.03	0.59		12.0	12.0	X	16.0	
47		0.03	0.62		12.0	12.0	X	15.3	
47		0.03	0.50		12.0	12.0	X	18.0	
Avg.		0.03	0.59		12.0	12.0	X	16.1	
48	F2	0.07	0.00	0.08	2.0	0.6	14.6	I	Heavy smoke
48		0.05	0.00	0.20	2.0	0.9	13.3	I	
48		0.07	0.00	0.23	1.2	1.2	8.8	I	
48		0.07	0.00	0.22	2.0	0.9	13.3	I	
Avg.		0.06	0.00	0.18	1.8	0.9	12.5	I	
49	F2	0.05	0.10	0.22	3.4	0.5	13.6	I	Moderate, very sooty smoke
49		0.05	0.07	0.22	3.2	0.5	14.7	I	
49		0.03	0.10	0.23	3.4	0.6	12.7	I	
49		0.03	0.10	0.20	3.6	0.6	13.4	I	
Avg.		0.04	0.09	0.22	3.4	0.6	13.6	I	
50	F2	0.03	1.02		12.0	7.0	X	10.1	
50		0.03	0.52		12.0	5.0	X	17.5	
50		0.03	0.75		12.0	10.0	X	13.1	
50		0.03	0.64		12.0	4.0	X	15.0	
Avg.		0.03	0.73		12.0	6.5	X	13.9	

TABLE III (Continued)

TEST METHOD 5902 - VERTICAL

Part 1 - General Tests - Representative Materials

Material No.	Code	Ignition Time (min.)	Flaming Time (Measured After 12 sec. Burner Removal) (min.)	Glow Time (Measured After Flameout) (min.)	Burn Length (in.)	Char Length (in.)	Burn Rate (12 sec. Burner Time Included) 0-12 in. (in./min.)	12 in. (in./min.)	Remarks
51	F2	0.03	0.00		2.5	0.2	15.0	I	Light gray, sooty smoke
51		0.03	0.00		2.5	1.0	15.0	I	
51		0.03	0.00		2.5	1.0	15.0	I	
51		0.03	0.00		2.3	1.0	13.8	I	
Avg.		0.03	0.00		2.5	0.8	14.7	I	
52	F2	0.03	0.00		2.4	1.0	14.4	I	
52		0.03	0.00		1.2	0.5	7.2	I	
52		0.03	0.00		1.2	0.0	7.2	I	
52		0.03	0.00		1.1	0.0	6.6	I	
Avg.		0.03	0.00		1.5	0.4	8.9	I	
53	F2	0.03	0.00	0.02	4.5	0.2	27.0	I	
53		0.03	0.00	0.02	4.0	0.3	24.0	I	
53		0.03	0.00		4.2	0.2	25.1	I	
53		0.03	0.00		4.2	0.2	25.1	I	
Avg.		0.03	0.00		4.2	0.2	25.3	I	
54	F2	0.03	0.00		1.8	0.0	10.8	I	Black, sooty smoke
5t,		0.03	0.00		1.0	0.0	6.0	I	Bubbles, gaseous flame
54		0.03	0.00		1.0	0.0	6.0	I	
54		0.03	0.00		0.8	0.0	4.8	I	
A"g.		0.03	0.00		1.2	0.0	6.9	I	
55	F2	0.05	0.00	0.07	2.0	0.0	13.0	I	
55		0.03	0.00	0.00	1.8	0.0	10.8	I	Moderate, gray smoke
55		0.03	0.00	0.07	1.6	0.0	9.6	I	
55		0.03	0.00	0.10	2.1	0.0	12.6	I	
Avg.		0.03	0.00		1.9	0.0	11.6	I	
56	F2	0.03	0.00	0.03	2.0	0.6	12.0	I	Bluish gray smoke
56		0.03	0.00	0.02	3.0	1.3	18.0	I	
56		0.03	0.00	0.03	2.6	1.0	15.6	I	
56		0.03	0.00	0.03	2.7	0.8	16.2	I	
Avg.		0.03	0.00		2.1	0.9	15.5	I	

TABLE III (Continued)

TEST METHOD 5902 - VERTICAL

Part 1 - General Tests - Representative Materials

Material No.	Code	Ignition Time (min.)	Flaminz Time (Heasured After 12 sec. Burner Removal) (min.)	Glow Time (Measured After Flameout) (min.)	Burn Length (in.)	Char Length (in.)	Burn Rate (12 sec. Burner Time Included) 0-12 in. (in./r.li".)	12 in. (in./min.)	Remarks
57	LI	0.03	0.00		6.6	1.0	39.5	I	Vinyl melts, exposes perforations
57		0.03	0.00	0.05	6.2	0.7	37.1	I	
57		0.03	0.00		6.9	1.0	41.3	I	
57		0.03	0.00		7.1	0.9	42.5	I	
Avg.		0.03	0.00		6.7	0.9	40.1	I	
58	L2	0.05	0.00		3.2	0.7	21.3	I	Gold material
58		0.03	0.00		J.O	0.6	18.0	I	Bubbles, bursts into gaseous
58		0.03	0.00		3.1	0.5	18.0	I	flame
58		0.03	*0.00*		3.0	0.6	18.0	I	Black, sooty smoke
Avg.		0.03	0.00		3.1	0.6	18.8	I	
59	L2	0.03	0.00		3.7	0.6	22.2	I	Black, sooty smoke
59		0.03	0.00		3.7	0.6	22.2	I	
59		0.03	0.00		3.3	0.4	17.8	I	
59		0.03	0.00		3.6	0.5	21.6	I	
Avg.		0.03	0.00		3.5	0.5	20.9	I	
60	F2	0.02	0.00	0.05	3.0	0.4	16.4	I	
60		0.02	0.00	0.03	3.2	0.3	17.5	I	
60		0.02	0.00	0.03	*3.I,*	0.4	18.6	I	
60		0.02	0.00	0.02	3.4	0.3	18.6	I	
Avg.		0.02	0.00		3.3	0.4	17.8	I	
61	F2	0.00	0.00		3.7	3.7	18.5	I	Blue gray smoke
61		0.07	0.00		4.5	4.5	33.8	I	
61		0.05	0.00		5.4	5.4	40.6	I	
Avg.		*0.04*	0.00		4.5	4.5	31.0	I	
62	F2	0.03	0.00		5.2	5.2	31.1	I	
62		0.03	0.00		5.7	5.7	34.1	I	
62		0.03	0.00		5.0	5.0	30.0	I	
62		0.03	0.00		4.4	4.4	26.3	I	
Avg.		0.03	0.00		5.1	5.1	30.4	I	

TABLE III (Continued)

TEST METHOD 5902 - VERTICAL

Part 1 - General Tests - Representative Materials

Material No.	Code	Ignition Time (min.)	Flaming Time (Measured After 12 sec. Burner Removal) (min.)	Glow Time (Measured After Flameout) (min.)	Burn Length (in.)	Char Length (in.)	Burn Rate (12 sec. Burner Time Included) 0-12 in. (in./min.)	Burn Rate (12 sec. Burner Time Included) 12 in. (in./min.)	Remarks
63	F2	0.03	0.00		4.3	4.3	25.7	I	
63		0.02	0.00		5.7	5.7	31.1	I	
63		0.02	0.00		6.2	6.2	33.9	I	
63		0.02	0.00		4.4	4.4	24.0	I	
Avg.		0.02	0.00		5.2	5.2	28.7	I	
64	F2	0.02	0.42		12.0	12.0	X	20.0	Heavy smoke
64		0.02	0.38		12.0	12.0	X	21.2	
64		0.02	0.45		12.0	12.0	X	18.9	
64		0.02	0.48		12.0	12.0	X	18.0	
Avg.		0.02	0.43		12.0	12.0	X	19.5	
65	F2	0.02	0.00		2.2	0.0	12.0	I	Moderate, gray smoke
65		0.02	0.00		2.0	0.0	10.9	I	
65		0.02	0.00		1.0	0.0	5.6	I	
65		0.02	0.00		1.2	0.0	6.6	I	
Avg.		0.02	0.00		1.6	0.0	8.8	I	
66	S1	0.02	0.00		3.2	2.4	17.5	I	
66		0.02	0.00		3.2	2.4	17.5	I	
66		0.02	0.00		4.4	2.2	24.0	I	
66		0.02	0.00		4.8	2.2	26.2	I	
Avg.		0.02	0.00		3.9	2.3	21.3	I	
67	F3	0.05	1.23	2.17	9.0	8.5	6.5	I	Moderate, gray smoke, foul odor
67		0.05	0.78	2.00	5.0	5.0	5.4	I	
67		0.05	0.92	3.00	6.4	5.8	6.0	I	
67		0.05	1.07	3.92	8.0	6.5	6.5	I	
Avg.		0.05	1.00		7.1	6.5	6.1	I	
68	S1	0.02	0.67		12.0	12.0	X	14.1	
68		0.02	0.95		12.0	12.0	X	10.6	
68		0.02	1.33		8.0	8.5	5.3	I	
68		0.02	0.75		12.0	12.0	X	12.8	
Avg.		0.02	0.93		11.0	11.1	13.2	I	

TABLE III (Continued)

TEST METHOD 5902 - VERTICAL

Part 1 - General Tests - Representative Materials

Material No.	Code	Ignition Time (min.)	Flaming Time (Measured After 12 sec. Burner Removal) (",in.)	Glow Time (Measured After Flameout) (min.)	Burn Length (in.)	Char Length (in.)	Burn Rate (12 sec. Burner Time Included) 0-12 in. (in./min.)	12 in. (in./min.)	Remarks
69	52	0.02	0.00		0.1	0.0	0.5	I	
69		0.02	0.00		0.1	0.0	0.5	I	
69		0.02	0.00		0.1	0.0	0.5	I	
69		0.02	0.00		0.1	0.0	0.5	I	
Avg.		0.02	0.00		0.1	0.0	0.5	I	
70	F1	0.03	0.00		6.4	4.1	38.3	I	
70		0.02	0.00		6.4	4.3	35.0	I	
70		0.02	0.00		5.4	3.5	30.0	I	
70		0.02	0.00		5.6	3.4	30.6	I	
Avg.		0.02	0.00		6.0	3.8	33.5	I	
76	A	0.00	0.00		0.0	0.1	0.0	I	
76		0.12	0.00		0.0	0.1	0.0	I	
Avg.			0.00		0.0	0.1	0.0	I	
77	53	0.07	9.75		12.0	12.0	X	1.2	Moderate smoke
77		0.07	7.12		12.0	12.0	X	1.7	Tremendous heat
Avg.			8.43		12.0	12.0	X	1.4	
80	A	0.12	0.20		0.0	0.0	0.0	I	
Avg.			0.20		0.0	0.0	0.0	I	
81	A	0.08	0.59		0.0	0.0	0.0	I	
Avg.			0.59		0.0	0.0	0.0	I	
82	A	0.07	0.43		0.0	0.0	0.0	I	
Avg.			0.43		0.0	0.0	0.0	I	
83	A	0.07	0.42		0.0	0.0	0.0	I	
Avg.			0.42		0.0	0.0	0.0	I	
84	A	0.05	0.33		0.0	0.0	0.0	I	
Avg.			0.33		0.0	0.0	0.0	I	

TABLE III (Continued)

TEST METHOD 5902 - VERTICAL

Part 1 - General Tests - Representative Materials

Material No.	Code	Ignition Time (min.)	Flaming Time (Measured After 12 sec. Burner Removal) (min.)	Glow Time (Measured After Flameout) (min.)	Burn Length (in.)	Char Length (in.)	Burn Rate (12 sec. Burner Time Included) 0-12 in. (in./min.)	Burn Rate (12 sec. Burner Time Included) 12 in. (in./min.)	Remarks
85	L3	0.00	0.00		0.0	0.0	0.0	I	
Avg.			0.00		0.0	0.0	0.0	I	
86	L3	0.00	0.00		0.0	0.0	0.0	I	
Avg.			0.00		0.0	0.0	0.0	I	
87	L3	0.00	0.00		0.0	0.0	0.0	I	
Avg.		0.00	0.00		0.0	0.0	0.0	I	
88	L3	0.00	0.00		0.0	0.0	0.0	I	
Avg.		0.00	0.00		0.0	0.0	0.0	I	
89	F3	0.07	1.22	2.00	12.0	12.0	X	8.8	
89		0.07	1.53	2.50	12.0	12.0	X	7.2	
39		0.07	1.74	2.17	12.0	12.0	X	6.4	
89		0.07	1.67	2.33	12.0	12.0	X	6.7	
Avg.		0.07	1.Y.		12.(1	12.0	X	7.3	
92	F2	0.05	0.02		2.8	2.8	16.8	I	
92		0.G5	0.00		3.2	3.0	21.3	I	
92		0.05	0.33		2.2	3.0	4.5	I	
92		0.05	0.23		3.2	3.8	8.4	I	
Avg.		0.05	0.15		2.9	3.2	12.8	I	
93	F2	0.05	0.00		1.6	1.2	10.0	I	
93		0.03	0.05		2.3	2.0	10.6	I	
93		0.03	0.10		2.0	0.3	7.5	I	
93		0.03	1.17		2.2	2.0	6.6	I	
Avg.		0.03	fl.33		2.0	1.4	8.7	I	
94	F2	0.02	0.07		7..0	0.2	9.2	I	
94		0.07	0.00		1.6	1.7	9.6	I	
9(		0.07	0.00		1.8	1.5	10.8	I	
94		0.07	0.00		1.7	1.6	10.2	I	
Avg.		0.07	0.01		1.8	1.3	10.0	I	

TABLE III (Continued)

TEST METHOD 5902 - VERTICAL

Part 1 - General Tests - Representative Meterials

Material No.	Code	Ignition Time (min.)	Flaming Time (Measured After 12 sec. Ul.Irner Removal) (I.,in.)	Glow Time (Measured After Flameout) (min.)	Burn Length (in.)	Char Length (in.)	Burn Rate (12 sec. 1I1'rner Time Incl.,ded) 0-12 in. (in./min.)	Burn Rate (12 sec. 1I1'rner Time Incl.,ded) 12 in. (in./min.)	Remarks
95	Sl	0.03	0.00		2.6	2.9	15.6	I	
95		0.03	0.00		1.6	2.0	9.6	I	
Avg.		0.03	0.00		2.1	2.4	12.6	1	
96	SI	0.02	0.00		2.0	0.2	10.9	I	
96		0.02	0.00		2.0	0.2	10.9	I	
96		0.02	0.00		2.0	0.8	10.9	I	
96		0.02	0.00		2.0	0.8	10.9	I	
Avg.		0.02	0.00		2.0	0.5	10.9	I	
97	Sl	0.02	0.02		3.0	0.7	15.0	I	Moderate, heavy smoke
97		0.02	0.00		3.0	1.0	16.3	I	Sample deforms
97		0.02	0.00		2.5	0.7	13.7	I	
97		0.02	0.00		2.5	1.0	13.7	I	
Avg.		0.02	0.01		2.7	0.9	14.6	I	
98	Sl	0.02	0.05		3.0	0.3	12.9	I	Moderate, heavy smoke
98		0.02	0.03		3.5	0.4	16.2	I	
98		0.02	0.00		3.4	0.4	18.6	I	
98		0.02	0.08		3.4	1.0	12.8	I	
Avg.		0.02	0.04		3.3	0.5	15.1	I	
99	R2	0.07	0.94		1.2	0.2	1.1	I	Pad backing burns 12 inches
99		0.07	1.08		1.1	0.2	0.9	I	
Avg.		0.07	1.01		1.1	0.2	1.0	I	
100	R1	0.05	0.40		2.5	0.1	4.5	I	
100		0.05	0.38		2.6	0.1	4.9	I	
Avg.		0.05	0.39		2.6	0.1	4.7	I	
107 (1)	Sl	0.03	0.05		2.5	5.0	11.3	I	Black, heavy smoke; acrid odor
Avg.		0.03	0.05		2.5	5.0	11.3	I	

TABLE III (Continued)

TEST METHOD 5902 - VERTICAL

Part 1 - General Tests - Representative Materials

Material No.	Code	Ignition Time (min.)	Flaming Time (Measured After 12 sec. Burner Removal) (min.)	Glow Time (Measured After Flameout) (min.)	Burn Length (in.)	Char Length (in.)	Burn Rate (12 sec. Burner Time Included) 0-12 in. (in./min.)	12 in. (in./min.)	Remarks
108(1)	51	0.03	0.00(2)		1.0	2.7	10.0	I	Black, dense smoke; acrid odor
Avg.			0.00		1.0	2.7	10.0	I	
109(1)	51	0.03	1.50		S.O	8.0	X	0.4	Very dense black smoke; acrid odor
Avg.			1.50		8.0	8.0	X	0.4	

Note (J): Materials 107, 108 and 109 were only eight inches in length.

Note (2): Material 108 flamed out 0.12 minutes before burner removal.

I Burned less than 12 inches
X Burned full length

TABLE III

TEST METHOD 5902 - **VERTICAL**

Part 2 - Special Tests - New, Used and Cleaned Materials

Material No.	Code	Igniti.on Time (min.)	Flaming Time (Measured After 12 sec. Burner Removal) (min.)	Glow Time (Measured After Flameout) (min.)	Burn Length (in.)	Char Length (in.)	Burn Rate (12 sec. Burner Time Included) 0-12 in. (in./min.)	Burn Rate (12 sec. Burner Time Included) 12 in. (in./min.)	Remarks
13N(1)	Fl	0.05	1.37		12.0	12.0	X	7.9	Very light smoke
13N		0.05	1.28		12.0	12.0	X	8.4	
Avg.		0.05	1.33		12.0	12.0	X	8.2	
13NC	Fl	0.05	1.45		12.0	12.0	X	7.5	
13NC		0.05	1.48		12.0	12.0	X	7.4	
Avg.		0.05	1.46		12.0	12.0	X	7.4	
13U	Fl	0.05	1.20		12.0	12.0	X	8.9	
13U		0.05	1.30		12.0	12.0	X	8.3	
Avg.		0.05	1.25		12.0	12.0	X	8.6	
13UC	Fl	0.05	1.07		12.0	12.0	X	9.8	
13UC		0.05	1.59		12.0	12.0	X	6.9	
Avg.		0.05	1.33		12.0	12.0	X	8.3	
18N	Fl	0.05	1.48		9.7	9.7	6.0	I	Very light smoke, melts, drips to
18N		0.05	1.70		10.0	10.0	5.4	1	bottom of cabinet and burns
Avg.		0.05	1.59		9.9	9.9	5.7	I	
18NC		0.05	1.05		10.5	10.5	8.8	I	
18NC		0.05	1.32		10.0	10.0	6.8	I	
Avg.		0.05	1.18		10.3	10.3	7.8	I	
18UC	Fl	0.05	1.89		12.0	12.0	X	5.9	
18UC		0.05	1.32		12".0	12.0	X	5.9	
Avg.		0.05	1.61		12.0	12.0	X	5.9	
J9N	Fl	a.n5	0.60		7.3	7.3	9.7	I	Light smoke, melts, drips to
19N		0.05	0.84		7.0	7.0	7.1	I	bottom of cabinet and burns
Avg.		0.05	0.72		7.2	7.2	8.4	I	

TABLE III (Continued)

TEST METHOD 5902 - VERTICAL

Part 2 - Special Tests - New, Used and Cleaned Materials

Material No.	Code	Ignition Time (Min.)	(Measured After 12 sec. Burner Removal) (min.)	Glow Time (Measured After Flameout) (min.)	Burn Lenf.th (in.)	Char Length (in.)	Burn Rate (12 sec. Burner Time Included) 0-12 in. (in./min.)	12 in. (in./min.)	Remarks
19NC	F1	0.05	0.97		7.0	7.0	6.3	I	
19NC		0.05	0.84		7.1	7.1	7.2	I	
Avg.		0.05	0.91		7.1	7.1	6.7	I	
19U	F1	0.05	0.74		12.0	12.0	13.5	I	
19U		0.05	0.50		8.3	8.3	12.8	I	
Avg.		0.05	0.62		10.2	10.2	13.1	I	
19UC	F1	0.05	0.75		8.0	8.0	8.9	I	Melts, drips to bottom of
19UC		0.05	0.42		7.8	7.8	13.9	I	cabinet and burns
Avg.		0.05	0.58		7.9	7.9	11.4	I	
20N	F1	0.05	0.53		5.6	5.6	8.2	I	
20N		0.05	0.53		5.5	5.3	8.1	I	
Avg.		0.05	0.53		5.6	5.5	8.1	I	
20NC	F1	0.05	0.90		6.9	6.9	6.6	I	
20NC		0.05	0.50		6.1	6.1	9.4	I	
Avg.		0.05	0.70		6.5	6.5	8.5	I	
20U	F1	0.05	0.40		6.0	6.0	10.9	I	
20U		0.05	0.92		6.7	6.7	6.3	I	
Avg.		0.05	0.66		6.4	6.4	8.6	I	
20UC	F1	0.05	0.50		6.0	6.0	9.2	I	
20UC		0.05	0.43		6.2	6.2	10.7	I	
Avg.		0.05	0.47		6.1	6.1	9.9	I	
27NC	R2	0.05	2.42		2.6	1.8	1.0	I	
27NC		0.05	2.52		1.8	1.0	0.7	I	
Avg.		0.05	2.47		2.2	1.4	0.8	I	

TABLE III (Continued)

TEST METHOD 5902 - VERTICAL

Part 2 - Special Tests - New, Used and Cleaned Materials

Material No.	Code	Ignition Time (min.)	Flaming Time (Measured After 12 sec. Burner Removal) (min.)	Glow Time (Heasured After Flameout) (min.)	Burn Length (in.)	Char Length (in.)	Burn Rate (12 sec. Burner Time Included) 0-12 in. (in./min.)	12 in. (in./;lIin.)	Remarks
27U	R2	0.05	2.94	1.33	5.0	3.8	1.6	I	
27U		0.05	6.18	1.28	12.0	9.5	X	1.9	
Avg.		0.05	4.56	1.31	8.5	6.7	1.8	I	
27UC	R2	0.05	0.97	1.17	1.0	0.2	0.9	I	
27UC		0.05	1.52	1.33	1.3	0.4	0.8	I	
Avg.		0.05	1.24	1.25	1.2	0.3	0.8	I	
99N	R2	0.07	0.94	1.17	1.2	0.2	1.1	I	
99N		0.07	1.08	1.33	1.1	0.2	0.9	I	
Avg.		0.07	1.01	1.25	1.2	0.2	1.0	I	
99NC	R2	0.05	0.85	1.17	1.5	0.2	1.5	I	
99NC		0.05	0.84	1.25	2.0	0.3	2.0	I	
Avg.		0.05	0.85	1.21	2.8	0.3	1.7	I	
99U	R2	0.05	3.25		5.0	7.0	1.5	I	
99U		0.05	7.33		12.0	12.0	X	1.6	
Avg.		0.05	5.29		8.5	9.5	1.6	I	
99UC	R2	0.05	2.74		4.0	5.0	1.5	I	
99UC		0.05	3.00		3.0	3.2	1.0	I	
Avg.		0.05	2.87		3.5	4.1	t.2	!	
lOON	Rl	0.05	0.40		2.5	0.1	4.5	I	Moderate smoke
lOON		0.05	0.38		2.6	0.1	l'.9	I	
Avg.		0.05	0.39		2.6	0.1	4.7	I	
IOONC	Rl	0.05	0.53		2.0	0.1	2.9	I	
100NC		0.05	0.20		loB	0.1	5.1	I	
Avg.		0.05	0.37		L9	0.1	4.0	I	

TABLE III (Continued

TEST METHOD 5902 - VERTICAL

Part 2 - Special Tests - New, Used and Cleaned Materials

Material No.	Code	Ignition Time (min.)	Flaming Time (Measured After 12 sec. Burner Remollal) (min.)	Glow Time (Measured After Flameout)	Burn Length (in.)	Char Length (in.)	Burn Rate (12 sec. Burner Time Included) 0-12 in. (in./min.)	Burn Rate (12 sec. Burner Time Included) 12 in. (in./min.)	Remarks
100U	R1	0.05	0.17		2.0	0.1	6.3	I	
100U		0.05	0.15		2.1	0.1	7.0	I	
Avg.		0.05	0.16		2.1	0.1	6.6	I	
lOaUC	Rl	0.05	0.33		3.5	0.1	7.3	I	
100UC		0.15	0.22		3.4	0.1	9.2	I	
Avg.		0.10	0.27		3.5	0.1	8.4	I	

Note (1): Letters after material no. signify: N - New; NC - New and Cleaned; U - Used; UC - Used and Cleaned

TABLE IV

TEST METHOD NBS **RADIANT PANEL**

Part 1 - General Tests - Representative Materials

Material No.	Code	Ignition Time (min.)	Burn Length (in.)	Burn Rate (Initial 3" Length) (in./min.)	Smoke Factor (mg)	Heat Factor (deg. C.)	Flame Spread Factor (F_s)	Flame Spread Index (I_s)	Coefficient of Variation (percent)	Remarks
1	R1		6-9			12	4.95	14		
1			6-9		1.2	29	6.76	45		
1		0.22	6-9	1.4		28	1.93	12		
Avg.						23	4.54	24	64	
2	FI		0		0.0	0	1.00	0		Melts away from pilot before ignition
2		0.16	6-9	4.9		16	6.13	22		
Avg.						8	3.57	11	50	
3	FI		0		0.0	0	1.00	0		Melts away from pilot before ignition
3			0		0.0	0	1.00	0		
3			0		0.0	0	1.00	0		
3			0		0.0	0	1.00	0		
Avg.					0.0	0	1.00	0	0	
4	FI		0		0.0	0	1.00	0		Melts away from pilot before ignition
4			0		0.0	0	1.00	0		
4			0		0.0	0	1.00	0		
4			0		0.0	0	1.00	0		
Avg.					0.0	0	1.00	0	0	
5	F2		9-12			33	13.08	98		
5			12-15		2.5	51	24.17	281		
Avg.					2.5	42	18.63	190	48	
6	FI		15+		0.8	47	19.13	205		Melts and drops against screen
6			15+		0.3	64	25.34	370		
6			6-9			8	10.00	18		
Avg.					0.6	40	18.16	198	73	
7	FI		15+		0.6	57	33.21	432		
7			15+		0.8	60	27.17	372		
Avg.					0.7	58	30.19	402	7	

TABLE IV (Continued)

TEST METHOD NBS RADIANT PANEL

Part 1 - General Tests - Representative Materials

Material No.	Code	Ignition Time (min.)	Burn Length (in.)	Burn Rate (Initial 3" Length) (in./min.)	Smoke Factor (mg)	Heat Factor (deg. C.)	Flame Spread Factor (F_s)	Flame Spread Index (I_s)	Coefficient of Variation (percent)	Remarks
8	Fl		15+		3.9	58	16.97	224		
8			15+		3.7	78	16.47	293		
Avg.					3.8	68	16.72	258	13	
9	F2		0		0.4	0	1.00	0		
9			0		0.0	0	1.00	0		
9			0		0.0	0	1.00	0		
Avg.					0.1	0	1.00	0	0	
10	Sl		15+		0.0	16	79.72	291		
10			9-12		1.4	16	27.41	100		
Avg.					0.7	16	53.56	195	48	
11	S3		3-6		0.8	47	2.30	25		
11		0.30	12-15	7.9	1.2	36	7.19	59		
11		0.56	12-15	30.0		59	7.47	100		
Avg.		0.43		18.9	1.0	47	5.65	61	50	
12	Rl		15+			152	10.64	369		
12			15+		1.1	150	9.06	310		
12		0.11	15+	5.8		181	9.77	403		
Avg.					1.1	161	9.82	361	11	
13	Fl	0.15	15+	9.1	1.2	86	13.82	271		
13		0.15	15+	15.0	0.1	69	13.71	216		
13		0.18	15+	15.8	0.7	74	13.05	220		
13		0.19	15+	15.0	0.9	51	12.68	147		
Avg.		0.17		13.7	0.7	70	13.32	214	21	
14	Fl	0.20	15+	15.8	0.4	48	13.67	150		
14		0.16	15+	15.8	0.5	38	13.63	118		
14		0.17	15+	18.8	0.5	48	14.82	162		
14		0.16	15+	18.8	0.6	38	15.75	137		
Avg.		0.17		17.3	0.5	43	14.47	142	10	

TABLE IV (Continued)

TEST METHOD NBS RADIANT PANEL

Part 1 - General Tests - Representative Materials

Material No.	Code	Ignition Time (min.)	Burn Length (in.)	Burn Rate (Initial 3" Length) (in./min.)	Smoke Factor (mg)	Heat Factor (deg. C.)	Flame Spread Factor (F_s)	Flame Spread Index (Is)	Coefficient of Variation (percent)	Remarks
15	FI	0.10	15+	19.1	3.8	24	9.96	55		Melts
15		0.10	0-3		3.1	6	1.00	1.4		Melts; some burning at pilot
15		0.10	12-15	11.5	2.0	27	9.67	60		Melts
15		0.11	15+	18.8	2.1	16	13.20	48		
Avg.		0.10		16.5	2.8	18	8.46	41	57	
16	FI	0.06	9-12	25.0	0.4	39	9.96	89		
16		0.08	3-6	17.6	0.2	22	5.00	25		
16		0.19	0-3		0.2	23	1.00	5.2		Melts; some burning at pilot
16		0.12	0-3		0.1	28	1.00	6.4		
Avg.		0.11		21.3	0.2	28	4.24	31	109	
17	FI	0.12	15+	12.0	1.2	46	12.69	133		
17		0.07	15+	7.9	1.1	38	12.45	108		
17		0.12	15+	9.7	0.9	44	10.87	109		
17		0.18	15+	11.5	1.7	36	13.33	109		
Avg.		0.12		10.5	1.2	41	12.34	114	9	
18	FI	0.16	15+	11.1	1.0	44	14.17	142		Melts; the drops fall to floor & burn
18		0.05	15+	7.5	0.8	29	15.33	101		
18		0.22	15+	12.5	0.8	25	11.20	64		
18		0.20	15+	20.0	0.7	14	14.50	46		
Avg.		0.16		12.8	0.9	28	13.80	88	42	
19	FI	0.16	15+	2.4	0.3	29	9.34	62		
19		0.12	9-12	7.9	0.1	10	7.25	17		
19		0.16	12-15	18.8	0.1	13	8.23	24		Melts; does not burn on floor
19		0.20	12-15	8.1	0.5	9	7.15	15		Melts; the drops fall to floor & burn
Avg.		0.16		9.3	0.3	15	7.99	29	64	
20	FI	0.14	0-3		0.1	19	1.00	4.3		Rapid melting; some burning at pilot
20		0.17	0-3		0.4	19	1.00	4.3		
20		0.17	0-3		0.4	21	1.00	4.8		
20		0.10	0-3		0.3	17	1.00	3.9		
Avg.		0.14			0.3	19	1.00	4.3	7	

TABLE IV (Continued)

TEST METHOD NBS RADIANT PANEL

Part 1 - General Tests - Representative Materials

Material No.	Code	Ignition Time (min.)	Burn Length (in.)	Burn Rate (Initial 3" Length) (in./min.)	Smoke Factor (mg)	Heat Factor (deg. C.)	Flame Spread Factor (F_s)	Flame Spread Index (I_s)	Coefficient of Variation (percent)	Remarks
21	F2	0.12	9-12	25.0	1.1	15	26.01	89		Violent flashing
21		0.07	9-12	21.4	1.3	22	20.57	103		
21		0.09	9-12	17.6	1.9	11	14.46	36		
21		0.10	12-15	16.7	1.4	7	20.35	33		
Avg.		0.09		20.2	1.4	14	20.35	65	48	
22	F2	0.05	9-12	25.0	1.2	9	8.96	18		Flashes
22		0.05	6-9	12.0	0.8	22	8.33	42		
22		0.08	6-9	11.1	0.3	18	10.53	43		
22		0.07	3-6	12.0	0.4	19	4.12	18		
Avg.		0.06		15.0	0.7	17	7.99	30	40	
23	F2	0.06	15+	16.7	1.7	66	26.16	394		
23		0.05	15+	17.6	3.4	38	28.30	245		
23		0.07	15+	16.7	3.8	49	24.48	274		
23		0.10	15+	17.6	1.9	39	35.58	316		
Avg.		0.07		17.2	2.7	48	28.63	307	18	
24	F2	0.07	6-9	5.9	1.3	14	6.16	20		Flashes the entire length of sample
24		0.10	9-12	4.4	3.0	20	18.37	84		Flashes; continues to glow after flame out
24		0.12	6-9	5.7	2.0	22	4.21	21		Flashes
24		0.10	9-12	6.0	2.1	12	9.94	27		Flashes
Avg.		0.09		5.5	2.1	17	9.67	38	70	
25	L1	0.05	9-12	2.8	16.1	65	4.76	71		Flashes
25		0.11	12-15	13.4	18.3	71	**12.91**	209		
25		0.14	12-15	2.2	14.5	68	7.66	119		
25		0.10	12-15	2.3	12.3	61	10.13	141		
Avg.		0.10		5.2	15.3	66	8.86	134	37	
26	R1	0.15	6-12	2.7	2.6	52	3.72	44		
26		0.12	12-15	2.7	3.5	59	5.92	80		
26		0.18	15+	3.1	1.1	78	9.76	174		
26		0.15	15+	2.8	1.5	60	8.03	110		
Avg.		0.15		2.8	2.2	62	6.86	102	47	

TABLE IV (Continued)

TEST METHOD NBS RADIANT PANEL

Part 1 - General Tests - Representative Materials

Material No.	Code	Ignition Time (min.)	Burn Length (in.)	Burn Rate (Initial 3" Length) (in./min.)	Smoke Factor (mg)	Heat Factor (deg. C.)	Flame Spread Factor (F_s)	Flame Spread Index (I_s)	Coefficient of Variation (percent)	Remarks
27	R2	0.15	15+	3.1	3.6	82	10.13	189		
27		0.11	15+	3.1	3.9	83	11.28	214		
27		0.18	15+	2.9	3.3	107	10.38	253		
27		0.14	15+	3.2	1.2	90	13.05	268		
Avg.		0.15		3.1	3.0	91	11.21	231	14	
28	F2	0.14	0-3		0.7	9	1.00	2.1		Flashes; burning around pilot
28		0.13	0-3		0.7	8	1.00	1.8		
28		0.06	3-6	13.6	0.8	16	4.57	17		
28		0.05	0-3		0.7	22	1.00	5.0		
Avg.		0.09		3.4	0.7	14	1.89	6.4	95	
29	L1	0.11	3-9	15.8	3.7	35	4.33	35		Flashes;large flame at top of specimen
29		0.09	9-12	9.7	2.8	28	7.00	45		
29		0.12	9-12	15.0	2.8	46	7.54	79		
29		0.12	0-3		3.1	50	1.00	11		
Avg.		0.11		10.1	3.1	40	4.97	42	57	
30	S3	0.25	9-12	3.8	25.4	63	5.22	75		Large flame at top of specimen
30		0.21	9-12	4.7	25.1	55	3.24	41		
30		0.12	9-12	4.8	24.2	71	5.41	88		
30		0.25	9-12	7.3	24.6	42	6.79	65		
Avg.		0.21		5.1	24.8	58	5.17	67	26	
31	S3	0.22	9-12	2.9	19.2	38	2.63	23		Flashes throughout test
31		0.11	9-12	4.6	16.8	43	6.29	61		
31		0.09	9-12	2.9	16.6	59	2.89	39		
31		0.22	9-12	2.3	18.1	53	2.96	36		
Avg.		0.16		3.2	17.7	48	3.69	40	35	
32	S3	0.17	9-12	5.8	21.0	73	6.17	103		Flashes
32		0.16	9-12	5.8	19.2	62	5.15	73		
32		0.24	9-12	5.4	1.3	68	4.62	72		
32		0.29	12-15	5.1	17.4	77	5.57	98		
Avg.		0.22		5.5	14.7	70	5.38	86	16	

TABLE IV (Continued)

TEST METHOD NBS RADIANT PANEL

Part 1 - General Tests - Representative Materials

Material No.	Code	Ignition Time (min.)	Burn Length (in.)	Burn Rate (Initial 3" Length) (in./Illin.)	Smoke Factor (Illg)	Heat Factor (deg. C.)	Flame Spread Factor (F_s)	Flame Spread Index (I_s)	Coefficient of Variation (percent)	Remarks
33	S3	0.15	9-12	7.0	17.4	55	6.18	78		Flashes
33		0.22	9-12	7.1	15.0	53	6.25	76		
33		0.24	9-12	7.5	10.8	60	6.20	85		
33		0.18	9-12	7.0	9.1	81	7.83	145		
Avg.		0.20		7.2	13.1	62	6.62	96	17	
34	S3	0.18	9-12	3.9	6.5	18	7.79	32		Flashes
34		0.09	6-9	4.6	7.1	20	4.52	21		
34		0.08	9-12	3.8	6.8	26	4.78	28		
34		0.22	9-12	6.0	6.3	34	5.76	45		
Avg.		0.14		4.6	6.7	25	5.71	31	28	
35	S2	0.10	6-9	4.6	1.7	16	10.02	37		
35		0.11	6-9	6.1	3.0	18	6.23	27		
35		0.16	6-9	7.0	1.8	9	4.28	8.8		
35		0.19	3-6	3.1	2.1	14	1.87	6.0		
Avg.		0.14		5.2	2.2	14	5.60	19	65	
36	F2	0.10	12-15	17.6	4.1	28	17.60	112		
36		0.10	12-15	20.0	5.8	31	12.29	87		
Avg.		0.10		18.8	4.9	29	14.95	100	13	
37	F2	0.09	15+	33.4	5.9	63	40.35	580		
37		0.05	15+	25.0	5.9	62	43.77	619		
Avg.		0.07		29.2	5.9	63	42.06	599	3	
38	F2	0.09	15+	33.4	4.7	46	44.59	468		
38		0.06	15+	25.0	5.6	50	44.17	504		
Avg.		0.08		29.2	5.2	48	44.38	486	4	
39	L2	0.16	9-12	4.8	2.9	26	7.44	44		
39		0.15	9-12	6.7	4.7	27	7.78	48		
39		0.14	9-12	5.5	2.3	24	10.57	58		
39		0.17	9-12	6.7	1.9	23	9.16	48		
Avg.		0.16		5.9	2.9	25	8.74	50	10	

TABLE IV (Continued)

TEST METHOD NBS RADIANT PANEL

Part 1- General Tests - Representative Materials

Material No.	Code	Ignition Time (min.)	Burn Length (in.)	Burn Rate (Initial 3" Length) (in./min.)	Smoke Factor (mg)	Heat Factor (deg. C.)	Flame Spread Factor (F_s)	Flame Spread Index (I_s)	Coefficient of Variation (percent)	Remarks
40	F2	0.05	15+	30.0	1.3	84	47.39	908		
40		0.05	15+	37.5	1.8	75	45.72	782		
40		0.10	15+	60.0	1.2	39	67.61	601		
40		0.10	15+	50.0	1.4	62	59.22	837		
Avg.		0.08		44.4	1.4	65	54.99	782	15	
41	Rl	0.30	12-15	4.1	7.2	141	6.93	223		Melta; drops fall to floor and burn
41		0.70	12-15	5.3	7.8	152	7.96	276		
41		0.75	9-12	6.7	7.4	134	6.78	207		
41		0.30	9-12	2.7	7.6	123	3.58	100		
Avg.		0.51		4.7	7.5	138	6.31	202	32	
42	Fl	0.18	15+	9.1	2.1	78	11.11	198		
42		0.21	15+	8.8	2.2	61	11.21	156		
42		0.15	15+	9.7	1.8	67	11.39	174		
42		0.18	15+	9.4	1.1	65	11.11	165		
Avg.		0.18		9.2	1.8	68	11.21	173	9	
43	Fl	0.14	15+	37.5	0.7	79	42.52	766		
43		0.11	15+	27.3	0.3	74	39.91	673		
43		0.16	15+	50.0	0.6	63	35.26	507		
43		0.15	15+	20.0	0.4	67	29.11	445		
Avg.		0.14		33.7	0.5	71	36.70	598	22	
44	Fl	0.14	15+	11.1	1.5	66	17.79	268		Melts; drops fall to floor and burn
44		0.20	15+	12.0	2.0	59	12.14	167		
44		0.11	15+	10.4	2.0	58	13.58	180		
44		0.17	15+	11.1	1.5	66	14.54	219		
Avg.		0.16		11.1	1.7	62	14.58	208	19	
45	Fl	0.17	15+	16.7	0.9	79	14.50	261		
45		0.30	15+	37.5	0.6	71	13.80	223		
45		0.16	15+	14.3	0.7	59	13.12	177		
45		0.12	15+	11.1	0.8	88	13.56	272		
Avg.		0.19		19.9	0.8	74	13.75	233	16	

TAnLE IV (Continued)

TEST METHOD NBS RADIANT PANEL

Part 1 - General Tests - Representative Materials

Material No.	Code	Ignition Time (min.)	Burn Length (in.)	Burn Rate (Initial 3" Length) (in./min.)	Smoke Factor (mg)	Heat Factor (deg. C.)	Flame Spread Factor (F_s)	Flame Spread Index (I_s)	Coefficient of Variation (percent)	Remarks
46	F2	0.18	12-15	6.1	3.3	27	7.96	49		Flashes
46		0.17	12-15	5.7	2.9	2/,	8.83	48		
46		0.07	12-15	2.7	3.1	45	8.63	89		
46		0.07	12-15	3.3	3.3	39	10.78	96		
Avg.		0.12		4.4	3.2	34	9.05	70	31	
47	Sl	0.09	9-12	33.3	0.4	15	32.3	111		
47		0.08	12-15	37.5	1.6	17	33.7	131		
47		0.05	15+	27.3	1.3	37	42.0	354		
47		0.06	12-15	30.0	0.9	39	34.2	303		
Avg.		0.07		32.0	1.1	27	35.5	225	47	
48	F2	0.11	9-12	2.8	1.2	30	7.58	52		Flashes
48		0.09	6-9	2.6	1.5	16	6.14	22		
48		0.07	9-12	2.5	0.9	36	7.11	58		
48		0.07	9-12	2.7	1.3	36	6.80	56		
Avg.		0.09		2.6	1.2	30	6.91	47	31	
49	F2	0.12	12-15	3.8	2.8	49	14.83	166		Flashes
49		0.15	15+	33.3	2.3	45	19.32	198		
49		0.12	9-12	23.1	2.1	45	11.15	114		
49		0.13	9-12	25.0	2.5	45	8.25	137		
Avg.		0.13		21.3	2.4	41	13.39	154	20	
50	F2	0.11	12-15	27.3	1.8	59	30.07	405		
50		0.09	12-15	23.1	2.1	46	20.19	212		
50		0.15	12-15	21.4	1.7	50	31.29	357		
50		0.06	9-12	15.0	1.5	62	22.57	376		
Avg.		0.10		21.7	1.8	52	26.03	337	22	
51	F2	0.05	0-3		1.0	18	1.00	4.1		Flashes to 6 inches
51		0.05	0-3		2.7	13	1.00	2.9		
51		0.05	6-9	6.8	0.7	22	36.37	182		Flashes
51		0.04	6-9	7.5	0.9	21	10.94	52		
Avg.		0.05		7.2	1.3	19	12.33	61	121	

TABLE IV (Continued)

TEST METHOD NBS RADIANT PANEL

Part 1 - General Tests - Representative Materials

Material No.	Code	Ignition Time (min.)	Burn Length (in.)	Burn Rate (Initial 3" Length) (in./min.)	Smoke Factor (mg)	Heat Factor (deg. C.)	Flame Spread Factor (F_s)	Flame Spread Index (I_s)	Coefficient of Variation (percent)	Remarks
52	F2	0.05	6-9	5.4	1.3	23	11.64	61		Flashes to 12 inches
52		0.05	3-6	5.5	0.2	18	2.66	11		
52		0.08	3-6	4.6	0.7	20	2.36	11		Flashes
52		0.06	6-9	6.0	0.9	29	8.11	54		
Avg.		0.06		5.4	0.8	22	6.19	34	68	
53	F2	0.07	6-9	3.6	1.1	23	5.44	29		Flashes
53		0.07	0-3		1.0	25	1.00	5.7		
53		0.08	6-9	4.1	0.5	18	8.89	34		
53		0.06	6-9	4.9	0.8	36	8.79	72		
Avg.		0.07		3.2	0.8	26	6.03	36	67	
54	F2	0.09	6-9	3.7	2.2	34	6.65	52		Flashes
54		0.09	6-9	3.6	2.4	28	7.95	51		
54		0.09	6-9	4.1	1.5	28	10.54	67		
54		0.09	6-9	3.8	1.9	42	4.99	48		
Avg.		0.09		3.8	2.0	33	7.53	54	14	
55	F2	0.15	12-15	2.8	5.9	71	30.38	492		Flashes at first of test
55		0.08	12-15	2.8	5.8	60	21.99	301		
55		0.11	12-15	5.5	4.5	54	8.59	106		Flashes
55		0.14	12-15	3.1	5.1	76	24.31	421		
Avg.		0.12		3.6	5.3	65	21.32	330	44	
56	F2	0.05	9-12	60.0	0.9	15	47.45	162		Flashes
56		0.05	9-12	75.0	1.3	12	70.44	193		
56		0.05	9-12	100.0	0.3	13	55.16	164		
56		0.04	9-12	60.0	0.9	22	70.44	353		
Avg.		0.05		73.8	0.8	16	60.87	218	36	
57	L1	0.05	12-15	60.0	2.1	13	42.11	125		Flashes
57		0.05	9-12	42.3	1.6	8	75.59	138		
57		0.05	6-9	75.0	0.8	7	45.44	73		
57		0.04	9-12	50.0	1.3	23	60.99	389		
Avg.		0.05		56.8	1.4	14	56.03	181	68	

TABLE IV (Continued)

TEST METHOD NBS RADIANT PANEL

Part 1 - General Tests - Representative Materials

Material No.	Code	Ignition Time (min.)	Burn Length (in.)	Burn Rate (Initial 3" Length) (in./min.)	Smoke Factor (mg)	Heat Factor (deg. C.)	Flame Spread Factor (F_s)	Flame Spread Index (I_s)	Coefficient of Variation (percent)	Remarks
58	L2	0.10	6-9	8.1	1.9	12	6.24	17		Flashes
58		0.12	6-9	6.3	2.4	20	10.38	47		
58		0.17	6-9	7.9	1.2	20	5.08	23		
58		0.10	6-9	6.6	1.8	20	4.96	23		
Avg.		0.12		5.7	1.8	18	6.67	28	42	
59	L2	0.09	6-9	6.5	1.4	19	6.65	29		Flashes
59		0.09	6-9	6.6	2.1	17	5.65	22		
59		0.17	6-9	6.0	3.0	15	4.34	15		
59		0.10	6-9	6.5	2.1	8	4.19	7.6		
Avg.		0.11		6.4	2.2	15	5.21	18	44	
60	F2	0.07	0-3		1.5	39	1.00	8.9		Flashes to 7 inches
60		0.09	12-15	30.00	3.1	29	16.27	108		Flashes
60		0.09	3-6	11.1	1.8	23	3.77	20		
60		0.07	0-3		1.9	37	1.00	8.4		
Avg.		0.08		10.3	2.1	32	5.51	36	115	
61	F2		0-3		0.0	18	1.00	4.1		Shrinks away from heat when exposed to pilot flame and does not ignite
61			0-3		0.0	19	1.00	4.3		
61			0-3		0.0	19	1.00	4.3		
61			0-3		0.0	22	1.00	5.0		
Avg.					0.0	20	1.00	4.4	8	
62	F2		0-3		0.0	15	1.00	3.4		Shrinks away from heat when exposed to pilot flame and does not ignite
62			0-3		0.0	20	1.00	4.6		
62			0-3		0.0	18	1.00	4.1		
62			0-3		0.0	19	1.00	4.3		
Avg.					0.0	18	1.00	4.1	4	
63	F2		0-3		0.0	13	1.00	3.0		Shrinks away from heat when exposed to pilot flame and does not ignite
63			0-3		0.0	13	1.00	3.0		
63			0-3		0.0	16	1.00	3.6		
63			0-3		0.0	20	1.00	4.6		
Avg.					0.0	16	1.00	3.6	6	

TABLE IV (Continued)

TEST METHOD NBS RADIANT PANEL

Part 1 - General Tests - Representative Materials

Material No.	Code	Ignition Time (min.)	Burn Length (in.)	Burn Rate (Initial 3" Length) (in./min.)	Smoke Factor (mg)	Heat Factor (deg. C.)	Flame Spread Factor (F_s)	Flame Spread Index (I_s)	Coefficient of Variation (percent)	Remarks
64	F2	0.04	9-12	60.0	1.7	19	70.44	305		
64		0.03	12-15	50.0	2.3	11	116.11	291		
64		0.04	12-15	37.5	1.4	28	85.08	543		
64		0.02	12-15	100.0	1.9	7	84.33	135		
Avg.		0.04		61.9	1.8	16	88.99	319	46	
65	F2	0.11	0-3		1.5	50	1.00	11		Burns only at pilot
65		0.12	0-3		1.5	45	1.00	10		
65		0.09	0-3		1.5	47	1.00	11		
65		0.09	0-3		1.5	38	1.00	8.7		
Avg.		0.10			1.5	45	1.00	10	10	
66	S1	0.06	6-9	21.4	1.6	22	10.54	53		
66		0.06	6-9	13.7	1.4	17	8.16	32		
66		0.04	3-6	12.5	1.3	13	4.57	14		Flashes
Avg.		0.05		15.9	1.4	17	7.76	33		
67	F3	0.16	15+	10.7	0.7	74	11.21	189		
67		0.20	15+	8.6	0.2	56	12.15	155		
67		0.12	15+	3.4	0.3	58	33.67	445		
Avg.		0.16		7.6	0.4	63	19.01	263	41	
68	S1	0.04	15+	30.0	0.1	34	33.22	258		Rapid smouldering, no large flame
68		0.06	15+	33.3	0.6	33	44.00	331		
68		0.05	15+	23.1	0.4	28	68.16	435		
68		0.05	15+	21.4	0.6	33	55.71	419		
Avg.		0.05		26.9	0.4	32	50.27	361	20	
69	S2	0.20	0-3		4.5	35	1.00	7.9		Burns at pilot, large amounts of white smoke
69		0.26	0-3		5.3	23	1.00	5.2		
69		0.41	0-3		4.7	29	1.00	6.6		
69		0.21	0-3		5.5	20	1.00	4.6		
Avg.		0.27			5.0	27	1.00	6.1	20	

TABLE IV (Continued)

TEST METHOD NBS RADIANT PANEL

Part 1 - General Tests - Representative Materials

Material No.	Code	Ignition Time (min.)	Burn Length (in.)	Burn Rate (Initial 3" Length) (in. Imin.)	Smoke Factor (mg)	Heat Factor (deg. C.)	Flame Spread Factor (F_s)	Flame Spread Index (I_s)	Coefficient of Variation (percent)	Remarks
70	Fl	0.09	6-9	9.1		12	20.04	55		
70		0.10	3-6	6.5		20	2.78	13		
70		0.09	3-6	7.3		21	3.00	14		
70		0.08	6-9	9.1		7	8.44	14		
Avg.		0.09		8.0		15	8.57	24	75	
71	A	0.07	0-3		0.5	31	1.00	7.1		Cover melts away - insulating material burns at pilot. Lead sheet in materiRl melts after approx. 13 minutes
71		0.05	0-3		0.8	28	1.00	6.4		
71		0.08	0-3		0.4	45	1.00	10		
Avg.		0.07			0.6	35	1.00	7.9	19	
72	A	0.05	9-12	2.6	0.8	12	7.85	21		Only vinyl burns, aluminum does not melt, insulation material on back does not burn
72		0.05	0-3		0.9	33	1.00	7.5		
Avg.		0.05		1.3	0.9	23	4.41	14.5	31	
73	A	0.05	12-15	6.0	2.1	51	26.25	305		Flashes
73		0.07	15+	12.0	7.8	66	16.94	255		
73		0.05	9-12	6.9	5.3	21	19.74	96		
73		0.06	15+	6.4	3.4	31	15.40	109		
A·"g.		0.05		7.3	4.6	42	19.58	191	20	
74	A	0.31	12-15	8.3	2.7	28	5.99	38		Flashes
74		0.15	9-12	5.7	2.7	15	7.80	27		
Avg.		0.23		7.0	2.7	22	6.89	33	18	
75	A		6-9		0.7	11	'5.05	13		Only vinyl burns, aluminum does not melt
75			9-12		2.8	10	16.60	38		
Avg.					1.8	11	10.83	25	49	
76	A	0.20	9-12	3.6	32.4	67	3.85	59		
76		0.17	12-15	3.1	38.6	64	4.27	62		
76		0.14	12-15	3.8	34.2	71	4.37	71		
76		0.14	12-15	3.9	33.1	69	5.03	69		
Avg.		0.16		3.6	34.6	68	4.38	68	31	

TABLE IV (Continued)

TEST METHOD NBS RADIANT PANEL

Part 1 - General Tests - Representative Materials

Material No.	Code	Ignition Time (min.)	Burn Length (in.)	Burn Rate (Initial 3" Length) (in./min.)	Smoke Factor (mg)	Heat Factor (deg. C.)	Flame Spread Factor (F_s)	Flame Spread Index (I_s)	Coefficient of Variation (percent)	Remarks
77	S3	0.19	15+	3.8	3.3	198	8.39	379		Melts, drops fall to floor and cause large fire on floor
77		0.20	15+	4.0	4.0	190	8.01	347		
Avg.		0.20		3.9	3.7	194	8.20	363	14	
78	A	0.57	15+	6.8	16.7	94	6.55	140		
78		0.37	15+	17.6	18.2	89	15.38	312		
78		0.21	15+	4.2	17.1	96	7.16	157		
Avg.		0.38		9.5	17.3	93	9.70	203	38	
79	A		12-15		6.4	42	4.49	43		Continues to glow for approx. 30 mins. after test
79			12-15		4.2	29	4.67	31		
79			9-12		7.1	49	3.57	40		
79			12-15		6.7	47	4.72	51		
Avg.					6.1	42	4.36	41	17	
80	A	0.30	6-9	4.7	7.2	49	4.62	52		
80		0.33	9-12	5.0	3.8	59	9.37	126		
80		0.36	6-9	4.5	3.3	69	4.24	67		
80		0.40	9-12	6.5	2.4	58	6.01	80		
Avg.		0.35		5.2	4.2	59	6.06	81	34	
81	A	0.35	9-12	3.7	6.0	54	5.32	66		Continues to smoulder after flame out
81		0.51	9-12	4.4	3.0	56	5.17	66		
81		0.58	9-12	5.2	2.8	70	5.60	89		
81		0.37	9-12	4.4	3.1	73	4.99	83		
Avg.		0.45		4.4	3.7	63	5.27	76	14	
82	A	0.18	9-12	1.6	4.7	55	4.21	53		
82		0.15	6-9	2.2	7.5	54	2.95	36		
82		0.14	6-9	2.0	3.9	62	5.62	79		Large flame at top of specimen
82		0.14	9-12	2.9	5.3	63	3.70	53		
Avg.		0.15		2.2	5.4	59	4.12	55	19	

TABLE IV (Continued)

TEST **METHOD NBS RADIANT PANEL**

Part 1 - General Tests - Representative Haterials

Material No.	Code	Ignition Time (min.)	Burn Length (in.)	Burn Rate (Initial 3" Length) (in./min.)	Smoke Factor (mg)	Heat Factor (deg. C.)	Flame Spread Factor (F_s)	Flame Spread Index (I_s)	Coefficient of Variation (percent)	Remarks
82	X	0.08	6-9	2.3		38	10.81	**94**		Grasscloth cover only
82		0.33	9-12	10.4		22	7.46	37		Polyester glass fabric only
82		0.08	15+	16.6		44	31.97	321		1-inch Paper Honeycomb only
82		0.14	6-9	2.8		41	12.93	121		Grasscloth & Polyester glass fabric
83	A	0.15	9-12	1.0	4.6	41	3.04	28		Outer covering blisters and burns before other materia1,slight flashing
83		0.20	9-12	1.0	6.4	40	3.53	32		
83		**0.09**	9-12	1.0	5.7	58	4.16	55		
83		0.12	9-12	1.0	4.1	43	3.31	33		
Avg.		0.14		1.0	5.2	46	3.51	37	17	
84	A	0.12	9-12	13.1	5.3	30	5.45	37		
84		0.14	9-12	3.6	4.9	53	4.72	57		
84		0.08	9-12	3.4	4.2	46	4.93	52		
84		0.17	9-12	4.0	2.3	37	11.16	**94**		Flashes
Avg.		0.13		5.9	4.2	42	6.57	60	35	
84	X	0.08	9-12	8.6		10	12.25	28		Cover material only
84		0.08	15+	27.3		49	32.37	362		½-inch Paper Honeycomb only
85	L3	0.57	6-9	15.0	1.1	14	9.03	**29**		Flashes
85		0.51	6-9	11.1	0.8	12	4.72	13		
85		0.53	6-9	20.0	2.9	7	4.86	7.8		
85		0.45	6-9	9.4	0.9	17	4.85	**19**		
Avg.		0.52		13.9	1.2	13	5.87	17	46	
86	L3	0.41	9-12	6.3	0.7	12	4.96	14		Flashes
86		0.37	9-12	4.9	1.3	10	5.72	13		
86		0.53	9-12	8.3	1.6	16	6.43	24		
86		0.43	6-9	8.8	0.9	16	3.78	14		
Avg.		0.44		7.1	1.1	14	5.22	16	27	

TABLE IV (Continued)

TEST METHOD NBS RADIANT PANEL

Part 1 - General Tests - Representative Materials

Material No.	Code	Ignition Time (min.)	Burn Length (in.)	Burn Rate (Initial 3" Length) (in./min.)	Smoke Factor (mg)	Heat Factor (deg. C.)	Flame Spread Factor (F_s)	Flame Spread Index (I_s)	Coefficient of Variation (percent)	RelD8rks
87	L3	0.60	6-9	12.5	1.5	17	5.13	20		Flashes; ID8terial flakes off and falls to floor still burning
87		0.49	9-12	12.5	1.3	13	6.72	20		
87		0.42	6-9	15.8	0.5	7	4.13	6.6		
87		0.35	6-9	8.8	0.8	17	4.02	16		
Avg.		0.47		12.4	1.0	14	5.00	16	34	
88	L3		0-3		0.2	16	1.00	3.6		Mo flame; Ky1ar melts and pulls away from aluminUlll
88			0-3		0.1	17	1.00	3.9		
88			0-3		0.1	13	1.00	3.0		
88			0-3		0.1	14	1.00	3.2		
Avg.					0.1	15	1.00	3.4	9	
89	F3	0.18	15+	12.0	1.2	40	12.06	110		
89		0.16	15+	10.7	0.7	66	10.60	160		
89		O.11	15+	8.1	0.7	36	11.94	98		
89		0.15	15+	U.S	0.8	57	18.59	242		
Avg.		0.15		10.6	0.9	50	13.30	152	37	
90	51	0.03	15+	9.1	21.3	136	48.38	1500		
91	51	0.02	15+	23.1		209	62.04	2956		
95	51	0.12	9-12	11.5	0.4	15	8.79	30		
96	51	0.05	6-9	5.3		24	8.16	45		
96		0.05	9-12	4.0		25	63.34	361		
96		0.05	9-12	5.7		25	17.36	99		
96		0.05	9-12	5.3		22	6.77	34		
Avg.		0.05		5.0		24	23.91	135	99	

TABLE IV (Continued)

TEST **METHOD NBS RADIANT PANEL**

Part 1 - General Tests - Representative Haterials

Material No.	Code	Ignition Time (min.)	Burn Length (in.)	Burn Rate (Initial 3" Length) (in./min.)	Smoke Factor (mg)	Heat Factor (deg. C.)	Flame Spread Factor (F_s)	Flame Spread Index (I_s)	Coefficient of Variation (percent)	Remarks
97	Sl	0.05	9-12	13.1		21	42.24	202		
97		0.05	6-9	12.0		23	8.49	45		
97		0.05	6-9	12.5		17	12.77	50		
97		0.05	6-9	10.0		27	9.11	56		
Avg.		0.05		11.9		22	18.15	88	75	
98	Sl	0.05	6-9	11.1		32	20.78	152		Flashes
98		0.06	9-12	8.1		25	22.76	130		
98		0.05	6-9	7.7		25	8.53	49		
98		0.05	9-12	11.6		39	12.27	109		
Avg.		0.05		9.6		30	16.09	110	35	
106	Sl		15+		1.0	48	78.91	864		Polyether Foam only (I-inch thick)
106	X	0.11	15+	9.7		117	17.77	474		Polyether Foam covered with #17 upholatery
106	X	0.16	15+	12.0	0.5	174	18.30	726		Polyether Foam covered with #13 upholstery
107	Sl	0.09	0-3		0.6	22	1.00	5.0		
108	Sl	0.11	0-3		0.6	12	1.00	2.7		
109	Sl	0.07	9-12	15.8	3.3	22	9.12	46		

X **Experimental**

TABLE IV (Continued)

TEST **METHOD NBS RADIANT PANEL**

Part 2 - Special Tests - New, Used and Cleaned Materials

Material No.	Code	Ignition Time (min.)	Burn Length (in.)	Burn **Rate** (Initial 3" Length) (in./min.)	Smoke Factor (mg)	Heat Factor (deg. C.)	**Flame** Spread Factor (F_s)	**Flame** Spread Index (I_s)	Coefficient of Variation (percent)	**Remarks**
13N	Fl	0.15	15+	11.5	0.8	92	14.13	296		
13NC		0.15	15+	17.6		103	14.48	340		
13U		0.19	15+	16.6	0.7	116	21.86	.578		
13U		0.18	15+	16.6	0.4	121	19.80	546		
Avg.		0.19		16.6	0.5	118	20.83	562	3	
13UC	Fl	0.17	15+	14.3	0.8	130	21.16	627		
13UC		0.17	15+	15.0	0.4	116	21.11	558		
Avg.		0.17		14.6	0.6	123	21.14	592	5	
18N	Fl	0.23	15+	25.0		51	17.84	207		**Melts;** the drops fall to floor **&** burn
18NC		0.20	15+	17.6	0.4	42	14.64	140		**Melts;** the drops fall to floor **&** burn
18NC		0.24	15+	15.8	0.3	59	14.47	197		
Avg.		0.22		16.7	0.4	50	14.55	167	17	
18U	Fl	0.17	15+	20.0	0.7	47	14.74	158		Melts; the drops fall to floor **&** burn
18U		0.18	15+	17.6	0.8	45	17.06	175		
Avg.		0.18		18.8	0.8	46	15.90	166	5	
18UC	Fl	0.15	15+	21.4	1.4	60	14.94	204		**Melts;** the drops fall to floor **&** burn
18UC		0.15	15+	14.3	0.9	43	14.64	144		
Avg.		0.15		17.9	1.2	51	14.79	174	17	
19N	Fl		9-12			16	10.46	38		Kelts; the drops fall to floor **&** burn
19NC			12-15			19	9.19	40		**Melts;** the drops fall to floor **&** burn
19U			0-3			12	1.00	2.7		**Melts,** the drops fall to floor, no
19U			0-3			12	1.00	2.7		burning on floor
Avg.						12	1.00	2.7		
19UC	Fl		0-3			11	1.00	2.5		**Melts;** no burning on floor
19UC			0-3			14	1.00	3.2		
Avg.						12	1.00	2.8	14	

TABLE IV (Continued)

TEST METHOD NBS RADIANT PANEL

Part 2 - Special Tests - New, Used and Cleaned Materials

Material No.	Code	Ignition Time (min.)	Burn Length (in.)	Burn Rate (Initial 3" Length) (in./min.)	Smoke Factor (mg)	Heat Factor (deg. C.)	Flame Spread Factor (F_s)	Flame Spread Index (I_s)	Coefficient of Variation (percent)	Remarks
20N	Fl		0-3			19	1.00	4.3		
20NC			9-12			19	8.39	36		Melts; the drops fall to floor & burn
20NC			0-3			14	1.00	3.2		Melts; no burning on floor
Avll..						16	4.69	20	82	
20U	Fl	0.23	0-3		0.3	11	1.00	2.5		Some burning at pilot
20U		0.22	0-3		0.2	16	1.00	3.6		
Av'il..		0.23			0.3	13	1.00	3.0	18	
20UC	Fl		0-3			15	1.00	3.4		Some burning at pilot
20UC			0-3			10	1.00	2.3		
Av'il..						13	1.00	2.9	19	
27N	R2	0.11	15+	3.1	2.9	83	11.28	214		
27NC		0.10	9-12	2.1	2.3	107	4.08	100		
27NC		0.10	9-12	2.1	2.2	101	4.20	97		
Avll. .		0.10		2.1	2.3	104	4.14	98	2	
27U	R2	0.13	15+	2.9	2.5	132	9.87	297		
27U		0.12	15+	2.8	2.7	115	8.84	232		
Avg.		0.13		2.9	2.6	123	9.35	264		
27UC	R2	0.11	12-15	2.8	2.7	124	12.35	349		
27UC		0.12	12-15	2.9	2.4	123	7.86	220		
Avg.		0.12		2.9	2.5	124	10.11	285	23	
70	Fl		0-3		0.2	25	1.00	5.7		Cleaned with Perchlorethylene spot cleaner and then placed in conditioning room overnight to dry
70			6-9		0.3	29	22.85	151		
Avg.					0.3	27	11.92	78		

TABLE IV (Continued)

TEST **METHOD NBS RADIANT PANEL**

Part 2 - Special Tests - **New,** Used and Cleaned Materials

Katerial No.	Code	Ignition Time (min.)	Burn Length (in.)	Burn Rate (Initial 3" Length) (in./min.)	Smoke Factor (mg)	Heat Factor (deg. C.)	Flame Spread Factor (F_s)	Flame Spread Index (I_s)	Coefficient of Variation (percent)	Remarks
99N	R2	0.10	12-15	3.0	3.1	110	12.38	311		
99N		0.10	12-15	3.0	3.2	94	8.74	187		
Avg.		0.10		3.0	3.2	102	10.56	249	25	
99NC	R2	0.10	15+	3.1	2.3	86	10.56	207		
99NC		0.17	15+	3.4	2.1	81	13.78	255		
Avg.		0.13		3.3	2.2	84	12.17	231	10	
99U	R2	0.09	12-15	2.2	1.3	97	10.54	233		
99U		0.09	12-15	2.9	0.9	87	11.84	235		
Avg.		0.09		2.5	1.1	92	11.19	234		
99UC	R2	0.11	9-12	3.0	1.8	98	4.23	95		
99UC		0.12	15+	3.0	2.1	104	9.54	226		
Avg.		0.12		3.0	1.9	101	6.89	160	41	
lOON	R1	0.12	3-6	2.8	1.4	44	1.83	18		
lOON		0.13	6-9	2.8	1.3	34	3.08	24		
Avg.		0.13		2.8	1.4	39	2.45	21	14	
100NC	R1	0.12	6-9	7.9	1.2	29	3.45	23		
100NC		0.12	6-9	2.5	1.2	39	1.99	18		
Avg.		0.12		5.2	1.2	34	2.72	20	13	
100U	R1	0.14	6-9	12.5	1.2	36	4.03	33		
100U		0.14	6-9	3.8	1.1	54	3.00	37		
Avg.		0.14		8.2	1.2	45	3.51	35		
100UC	R1	0.12	6-9	16.7	1.4	59	4.82	65		
100UC		0.12	6-9	16.7	1.3	55	4.85	61		
Avg.		0.12		16.7	1.4	57	4.84	63	3	

Note: Letters after material no. signify: N - **New;** NC - **New** and Cleaned; U - Used; UC - Used and Cleaned.