U.S. CONSUMER PRODUCT SAFETY COMMISSION

WASHINGTON, D.C. 20207

Record of Commission Action
Commission Meeting of March 1, 1979

1111 - 18th Street, N.W.
Washington, D.C.

Presiding: Chairman King

Present : Commissioner Pittle
Commissioner Sloan
Commissioner Zagoria

ITEM

Proposed Amendment to the Interim Standard for Cellulose Insulation

(Briefing material transmitted by the Office of the Secretary on February 28, 1979.)

DECISION

The Commissioners approved the attached Federal Register document proposing an amendment to the Interim Standard for Cellulose Insulation.

VOTE

Concurring: Chairman King Susan B. King

Commissioner Pittle R. David Pittle

Commissioner Sloan Edith B. Sloan

Commissioner Zagoria Sam Zagoria

Submitted by the Office of the Secretary

Federal Register

THURSDAY, MARCH 8, 1979

PART IV

CONSUMER PRODUCT SAFETY COMMISSION

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INTERIM STANDARDS FOR CELLULOSE INSULATION

Proposals

[6355-01-M]

CONSUMER PRODUCT SAFETY COMMISSION

[16 CFR Part 1209]

AMENDED INTERIM STANDARD FOR CELLULOSE INSULATION

Subpart B—Proposed Certification Rule

AGENCY: Consumer Product Safety Commission.

ACTION: Proposed rule.

SUMMARY: In this document the Commission proposed regulations that manufacturers, private labelers, and importers must follow to certify that their products comply with the Commission's amended Interim Standard for Cellulose Insulation. The proposal contains requirements for conducting a reasonable testing program, for recordkeeping, and for certifying. These requirements will assist manufacturers, private labelers, and importers in complying with the amended interim standard and will also help the Commission monitor compliance with that standard.

DATES: The Commission proposes that the rule be applicable to cellulose insulation manufactured after October 15, 1979.

Written comments on the proposed rule, preferably in five copies, must be received by April 9, 1979.

ADDRESS: Written comments should be submitted to the Office of the Secretary, Consumer Product Safety Commission, 1111 18th St., N.W., Third Floor, Washington, D.C. 20207. All comments received and other information relating to this proceeding may be viewed in the Office of the Secretary.

FOR FURTHER INFORMATION CONTACT:

Allen Brauninger, Directorate for Compliance and Enforcement, Consumer Product Safety Commission, Washington, D.C. 20207, 301-492-6629.

SUPPLEMENTARY INFORMATION: Elsewhere in this issue of the FEDERAL REGISTER at page 12746, the Commission has published a proposed amendment of the Interim Standard for Cellulose Insulation which addresses the flame resistance and corrosiveness of cellulose insulation. The interim standard was published on August 8, 1978 (16 CFR Part 1209, 43 FR 35240). The proposed amendment incorporates (with changes made by the Commission) the requirements for settled density, smoldering combustion, critical radiant flux, and corrosiveness contained in the purchasing specification for cellulose insulation of the General Services Administration issued on June 15, 1978 and designated GSA Specification HH-I-515D. If issued by the Commission on a final basis, the proposed amendment would change the test procedures the Commission uses to determine if cellulose insulation produced or distributed for sale to or use by consumers is acceptable for flame resistance and corrosiveness. A more detailed explanation of the proposed amendment's requirements, rationale, and background is given in the preamble to the proposed amendment.

The Commssion is proposing to issue this certification rule to inform manufactuers, private labelers, and importers of the procedures to use in certifying that their products comply with the proposed amendment, in the event that it is issued in final form. In publishing the proposed certification rule at the same time as the proposed amendment, the Commission believes that manufacturers, importers, and private labelers of cellulose insulation will be able to more accurately assess the costs and effects of the proposed amendment to the standard, and will, therefore, be able to provide the Commission with more complete information in their comments on the proposed amendment and proposed certification rule.

Under the proposed certification rule manufacturers, private labelers, and importers are responsible for 1) implementing their own reasonable testing programs within certain broad outlines, 2) issuing certificates of compliance for cellulose insulation in the form of labels or separate certificates which state that the cellulose insulation complies with the standard and supply other specified information, and 3) keeping records which demonstrate that the certificates are based on a reasonable testing program. These requirements are discussed in detail in this preamble.

NOTICE OF INTENT TO PROPOSE AN AMENDMENT TO THE STANDARD

In the FEDERAL REGISTER of September 6, 1978 (43 FR 39720), the Commission published a notice of its intent to propose an amendment to the Interim Standard for Cellulose Insulation which would substitute the tests for settled density, smoldering combustion, critical radiant flux, and corrosiveness contained in GSA Specification HH-I-515D for the tests for flame resistance and corrosiveness currently specified in the interim standard. In that notice, the Commission solicited comments from all interested persons about many issues involved in proposing such an amendment to the standard, including issues related to certifying compliance with the standard if it were amended.

The notice stated that while section 14 of the Consumer Product Safety Act (CPSA) (15 U.S.C. 2063) gives the Commission authority to issue regulations to prescribe a reasonable testing program which must be used to support certification of compliance with any consumer product safety standard, the act does not require the Commission to issue such regulations. In the absence of a regulation prescribing a reasonable testing program, manufacturers, private labelers, and importers must either test each product, or devise and implement their own reasonable testing programs to support issuance of the certificate of compliance required by section 14.

In the notice of September 6, 1978, the Commission solicited comments on the issues of whether it should propose a regulation prescribing a reasonable testing program to support certification with the proposed amended standard, and if so, the form that such proposed regulations should take. The notice solicited comment on three broad alternatives that the Commission staff was considering for the form of proposed regulations to prescribe a reasonable testing program.

The first alternative described in that notice would require certification of insulation on a lot-by-lot basis, using the quality assurance provisions in paragraph 4 of GSA Specification HH-I-515D. Those provisions reference the sample selection procedures of Military Standard 105 (MIL-STD-105) "Sampling Procedures and Tables for Inspection Attributes," and require that the sample selected shall be subjected to all of the tests in the proposed amended standard.

The second alternative would require manufacturers to qualify their products by performing all of the tests in the proposed amended standard with passing results, and then to demonstrate each day that the product being produced is substantially the same as the product which yielded passing results when subjected to qualification tests.

The third alternative would require manufacturers to test their production each day, using simplified tests which could be conducted quickly at the place of production and which would be reliable predictors of the likelihood that the insulation would pass the tests specified in the proposed amended standard.

COMMENTS ON CERTIFICATION ISSUES

In response to the notice of September 6, 1978, comments on issues relating to certification were received from seven manufacturers of celluslose insulation, one chemical manufacturer, four testing laboratories, one consulting engineering firm, and one association of testing laboratories.

Four commentors favored the second alternative described in the

notice of September 6, 1978, and two commentors recommended a combination of the second and third alternatives. Most of these comments objected to the first alternative suggested in the notice of September 6, 1978, stating that such an approach would require manufacturers to hold large quantities of insulation pending completion of all tests specified in the proposed amended standard. These comments stated that the first alternative for a testing program would cause manufacturers to incur costs of maintaining large quantities of insulation in inventory, of obtaining warehouse space, and of segregating individual lots while in storage. The Commission agrees with these commentors that a testing program designed along the lines of the first alternative might create an undue burden on manufacturers.

A comment favoring the second alternative stated that a major problem involved with a testing program based on the third alternative is the lack of simplified tests which are known to have a high degree of correlation with the tests set forth in the proposed amended standard. One of two commentors favoring the third alternative agreed that much work must be done to establish the correlation between any simplified tests which might be performed by manufacturers at the place of production and the tests of the proposed amended standard.

The Commission staff explored the possibility that a test involving exposure of small quantities of insulation to a flame and measurement of any resulting char length and weight loss might be performed by manufacturers in place of the test for critical radiant flux in the proposed amended standard, and that a test measuring the acidity of the insulation might be performed by manufacturers instead of the corrosiveness test of the proposed amended standard. At this time, Commission staff lacks sufficient evidence that either of these tests has a high degree of correlation with the tests in the proposed amended standard. For this reason, the Commission is not proposing to require a testing program based on the third alternative suggested in the notice of September 6, 1978. However, the Commission recognizes that these or other simplied tests may be established in the future to have a sufficiently high degree of correlation with the tests in the proposed amended standard to merit their use in a reasonable testing program.

Three insulation manufacturers recommended that the Commission not issue specific requirements for a reasonable testing program, but that manufacturers be permitted to submit testing programs to the Commission for approval as "reasonable testing programs" to support certification of compliance. These comments state that a testing program which is workable for small manufacturers may not be practical for large manufacturers.

The Commission agrees that it is difficult to design a testing program which would be appropriate for all manufacturers and therefore, as is explained further below, has decided not to issue specific requirements for such a program. However, the Commission also declines to establish a procedure by which reasonable testing programs are submitted to the Commission for approval. The Commission believes such a procedure would place a heavy burden on the agency's limited resources by necessitating evaluation of individual testing programs. Instead, in this proposed certification rule, the Commission has decided to provide manufacturers, private labelers, and importers with a mandatory outline of a reasonable testing program, without specifying the type or frequency of tests for such a program.

The proposed testing program follows the general approach of the second alternative in the notice of September 6, 1978 because it requires qualification and production testing (without specifying the content of testing). The program is described below.

Reasonable Testing Program

As noted above, section 14(a) of the Consumer Product Safety Act requires each manufacturer, importer, or private labeler of a product which is subject to a consumer product safety standard to issue a certificate of compliance with the applicable standard and to base that certificate upon a test of each item or upon a reasonable testing program.

Because it is not practical to test each item subject to the standard, it is necessary for manufacturers, private labelers, and importers to use a reasonable testing program for cellulose insulation to support certificates of compliance with the proposed amended standard.

The proposed testing program allows manufacturers, private labelers, and importers to determine the types and frequency of testing for their own programs. The Commission believes that it should not specify these elements because a uniform, mandatory program would not be suitable for all cellulose insulation manufacturers. The manufacturers' operations differ in size and profitability. Quality control also varies between plants. For example, a manufacturer with a large daily output of insulation and with good sales prospects may be able to afford and may wish to conduct more frequent and more complex testing than a small manufacturer with a marginal operation. All manufacturers, of course, must comply with the proposed amended standard, if it is issued in final form.

While the Commission is not requiring specified testing at explicit intervals, the proposed rule does provide that all reasonable testing programs must conform to certain broad outlines. This is because the Commission believes that current cellulose insulation production, even with the best state-of-the-art in manufacturing, is sufficiently variable to warrant periodic testing to demonstrate that the product complies with the proposed amended standard.

Because of natural variability in the manufacturing process and the raw materials, some cellulose insulation manufacturing plants may experience difficulty in maintaining a consistent product. Based on information received concerning the cellulose insulation manufacturing process, the Commission has learned that variations in the final product may be caused by factors such as the quality of the paper (especially, if a manufacturer buys from more than one source), the availability and quality of the necessary chemicals, the grinding of the chemicals, the mechanism feeding chemicals into the paper stock, and the pulverization of the product. The manufacturing process is also affected by external factors such as ambient temperature and relative humidity. For some manufacurers, equipment breakdowns and equipment degradation through wear are common. Constant vigilance may be required to keep the manufacturing process functioning properly. In short, information available to the Commission indicates that current cellulosic insulation production is likely to result in significant product variability unless the manufacturing process is closely monitored.

Based on the nature of the manufacturing process, the Commission concludes that periodic testing of samples of insulation being produced is essential to ensure that the insulation will comply with the proposed amended standard.

Accordingly, proposed § 1209.33(b) requires that all reasonable testing programs must consist of four parts:

1. Qualification tests which must be performed on samples of the manufacturer's cellulose insulation to demonstrate that the product is capable of passing the tests prescribed by the proposed amended standard.

2. A written description of the raw materials, production equipment, and manufacturing process used to produce the cellulose insulation which passed the qualification testing. This description is known as the "product specification."

3. Production tests performed at appropriate intervals on the insulation as it is manufactured to demonstrate that the product being manufactured is substantially similar to the product which passed the qualification tests and to demonstrate that the product being manufactured meets the requirements of the proposed amended standard.

4. Corrective action, which must be taken whenever samples of the cellulose insulation yield unacceptable or failing test results.

The section on qualification testing (proposed § 1209.34) states that before any manufacturer, importer, or private labeler distributes any cellulose insulation which is subject to the standard, samples of the insulation must be tested for compliance with the standard. (As used in the rest of this preamble, the term "standard" means the proposed amendment to the interim standard for cellulose insulation based on GSA specification HH-I-515D.) Manufacturers, private labelers, or importers are free to determine what type of qualification testing to conduct. The qualification testing may be performed before the effective date of the standard.

The second step of the required reasonable testing program is the preparation of a written description of the cellulose insulation which passed the qualification testing. This written description is referred to as the "product specification."

Section 1209.35 of the proposed certification rule requires that the product specification include the following information:

a. A description of the equipment used to manufacture the insulation, including the model numbers and names of the equipment manufacturers, and details of any modification made to any item of equipment.

b. A description of the cellulosic stock material used.

c. The formulation of fire-retardant chemicals added, including their chemical constituents and their form (that is, granulated or powered); the amount of chemicals present in the finished insulation, expressed as a percentage of the total weight of chemicals and cellulosic stock; and the name and address of each chemical supplier.

d. A description of the tests which were used to qualify the product as well as the dates of performance and results and actual values, where applicable, of the tests.

e. Any other information needed to describe the product.

Proposed § 1209.35(d) states that whenever the manufacturer, private labeler, or importer makes any change to any item of production equipment, raw materials, or manufacturing process which is likely to affect the ability of the cellulose insulation to meet the standard, that change will result in a new product, requiring the preparation of a new product specification. Such a change will also require that the new product be subjected to qualification tests with passing or acceptable results.

The product specification required by proposed § 1209.35 must be prepared before any cellulose insulation subject to the standard is distributed in commerce. However, preparation of the product specification may be done at any time before the effective date of the standard, if the manufacturer desires.

The third step of the reasonable testing program appears in proposed § 1209.36. It consists of production tests which must be performed at "production intervals" to establish that the product being manufactured is substantially similar in those properties affecting flame resistance and corrosiveness to the product which passed the qualification testing and which is described in the product specification. ("Production interval" is defined in proposed § 1209.32(b) to mean a time span determined by the manufacturer, private labeler, or importer to be appropriate for conducting a test or series of tests on samples of the insulation being produced to demonstrate that the product meets the requirements of the standard. An appropriate production interval may vary from test to test.)

Manufacturers, private labelers, and importers must determine the types of tests for production testing. Furthermore, each production test is required to be conducted at a "production interval" short enough to ensure that if the samples selected for testing meet the standard or a portion of the standard, the insulation produced during the interval will also meet the standard or the appropriate portion of the standard.

If any production test yields failing results, production must cease and the manufacturing process must be "corrected". In addition, the material from which the samples were taken may not be distributed in commerce unless the material can be "corrected" so as to meet the standard. Cellulose insulation that does not comply with the standard cannot be sold or offered for sale.

Proposed § 1209.37(a) states that "corrective action" may consist of replacement, adjustment, or repair of equipment; change of chemical formulation or chemical quantity; change in cellulosic stock material; or any other action which a manufacturer believes is necessary to produce complying insulation. Corrective action includes changes to the manufacturing process as well as reworking the insulation product itself.

Proposed 1209.37(b) provides that if any corrective action required to be taken results in a change to the product so that it is no longer accurately described in the product specification, a new product results. Any new product must be subject to qualification testing in accordance with proposed § 1209.34 and must be described in a product specification in accordance with proposed § 1209.35 before the new product may be distributed in commerce.

The proposed certification rule states at § 1209.33(c) that the Commission will test for compliance with the standard by using the test procedures set forth in the standard. The proposed rule emphasizes, however, that manufacturers are free to use *any* reasonable test procedures. The proposed rule also states at § 1209.33(d) that any or all of the testing for the reasonable testing program may be performed by an outside party qualified to perform such tests. The manufacturer, private labeler, or importer retains responsibility for ensuring that all testing has been properly performed with acceptable results and for ensuring the integrity of all records of such tests required to be maintained by § 1209.38 of the proposed rule. In response to the September 6, 1978 notice of intent, comments from two manufacturers of cellulose insulation, two testing organizations, and one association of testing organizations suggested that the Commission *require* that the sampling and testing supporting certification be performed by parties other than the manfacturer of the product.

As noted above, the Commission has not followed this suggestion. The Commission points out that such a requirement could be unfair to certain firms, particularly larger manufacturers, who might be able to perform reasonable testing at a lower cost than the fees imposed by an outside testing laboratory. In addition, the Commission points out that such a requirement might necessitate issuance by the Commission of regulations determining exactly what type of firms and organizations would be eligible to perform the required sampling and testing. This, the Commission believes, would be an unnecessary burden on Commission resources.

Recordkeeping Requirements

Proposed § 1209.38 requires that manufacturers, private labelers, and importers subject to the standard maintain the following records which are required to be available to any designated officer or employee of the Commission upon request: (Section 16 (b) of the Consumer Product Safety Act (15 U.S.C. 2065(b)) authorizes the

Commission to require the establishment and maintenance of records that are necessary to implement the act or to determine compliance with regulations issued under the act. The section also provides that the records must be made available for inspection by duly designated agents of the Commission upon request).

1. A record of each product specification containing all the information required by proposed § 1209.35.

2. Records to demonstrate compliance with the requirements for production testing in proposed § 1209.36, including a description of the types of production tests conducted and the production interval selected for performance of each production test.

3. Records of all corrective actions taken, including the specific action taken, the date the action was taken, and the test failure which necessitated the action. These records are required to relate the corrective action taken to the product specification of the cellulose insulation which was the subject of the action and the product specification of any new product resulting from the action.

4. Records indicating exactly which insulation material is covered by each certificate of compliance issued.

The primary purpose for requiring maintenance of these records is so that manufacturers, private labelers, or importers will be able to demonstrate that they are conducting a reasonable testing program in certifying their products. In aiding Commission enforcement of the certification rule, the records will, of course, also promote Commission enforcement of the amended standard.

Besides aiding Commission enforcement, the records could be helpful to a manufacturer in limiting the scope of a possible recall order under section 15 of the CPSA. (The Commission is authorized under section 15 to order a manufacturer of a product which is found, after a hearing, to present a "substantial product hazard" to elect one of the following remedies: repair the defective product, replace the product with a non-defective product, or refund the purchase price of the product. "Substantial product hazard" is defined in section 15 to mean a failure to comply with an applicable consumer product safety rule or a product defect, which creates a substantial risk of injury to the public.) Records of product specifications, changes in specifications, dates and results of production tests, information concerning production intervals, and dates and results of corrective actions are examples of the types of information which could serve to identify the period of time during which noncomplying insulation was manufactured. In the absence of such information, all production conforming to a particular product specification could be subject to a recall order.

The records of each product specification are required to be maintained for as long as a product conforming to that specification is manufactured and for two years thereafter. Records of production testing, corrective actions taken, and certificates issued are required to be maintained for two years.

Retention of records for two years is required by the proposed rule because the Commission staff has obtained samples of cellulose insulation which were manufactured more than a year before those samples were collected. Some of these were taken from retailers' inventories. Thus, the Commission has evidence that cellulose insulation may remain in inventories before reaching the ultimate consumer for more than one year after it is manufactured. Commission enforcement personnel are particularly interested in being able to check the records concerning any insulation held in inventory.

The Commission is interested in receiving comments on whether the records required to be maintained by proposed § 1209.38 are the type of records manufacturers would normally keep to support certificates of compliance, even if the records were not specifically required by this proposed rule. The Commission is also interested in whether the information required for the records under proposed § 1209.38 could be incorporated into other records insulation manufacturers normally keep.

Certification of Compliance

1. Responsibilities of Manufacturers

Proposed § 1209.39(a)(1) of the regulations published below requires manufacturers of cellulose insulation subject to the standard which is sold in bags or similar containers to certify compliance with the standard with a label on each bag or container. The labels will be considered "certificates" of compliance, as that term is used in section 14(a) of the CPSA. (Note: Section 14(c) authorizes the Commission to issue rules requiring a product to bear a label containing specified information.) The certification label may be the same label required by § 1209.9 of the standard, as long as all the information required by both labels is clear.

The certification label is required to include the following information:

a. The statement "This product meets the amended CPSC standard (effective October 16, 1979) for the flame resistance and corrosiveness of cellulose insulation."

b. The name of the manufacturer (or private labeler or importer, see below) issuing the certificate.

c. The date of manufacture by day, month, and year.

d. The place of manufacture, by city, state, and zip code, or in the case of products manufactured outside the United States, by city and country.

This information must appear prominently and conspicuously on each bag or container in letters and figures at least one-fourth of an inch in height. All of the information, except for the statement concerning compliance with the proposed amendment and the name of the person issuing the certificate, may be in code if any interpretation of the coding system is available to consumers, persons in the chain of distribution, and the Commission.

In those few instances where cellulose insulation is not sold in bags (Information available to the Commission indicates that nearly all cellulose insulation is sold in bags), the certificate of compliance must necessarily be in the form of a document which is separate from the product. Proposed § 1209.39(a)(2) provides for certification with a separate document such as an invoice, a bill, or other statement which must accompany the shipment or delivery of insulation not sold in bags. The separate document is required to contain the name of the manufacturer, private labeler, or importer issuing it as well as the statement—"This product meets the amended CPSC standard (effective October 16, 1979) for flame resistance and corrosiveness of cellulose insulation. This material was manufactured on (insert day, month, and year of manufacture) at (insert city, state, and zip code, or in the case of insulation manufactured outside the United States, city and country)." The information concerning the date of manufacture and the place of manufacture may be in code, provided an interpretation of the code is available to the Commission, persons in the chain of distribution, and consumers upon request.

In deciding that certification for cellulose insulation, where feasible, should be in the form of a label rather than a separate certificate the Commission points out that the label will be visible to all in the distribution chain, and the certification will be immediately available if any questions arise whether particular bags of insulation comply with the amended standard. The Commission believes that a certificate of compliance in the form of a label on each bag is the most convenient and probably the least costly form of a certificate for manufacturers. (This is especially true because a label stating that the product meets the amended Commission standards for cellulose insulation would be required under the proposed amended

standard.) The Commission also points out that a label affixed to each bag of insulation, in contrast to a certificate covering many bags of insulation and supplied to the retailer, is much more meaningful to consumers and will enable them to identify complying cellulose insulation.

The Commission, furthermore, notes that certificates of compliance in the form of separate documents may create a problem for Commission enforcement personnel and all parties in the chain of distribution in determining what specific products are covered by particular certificates, especially after the products covered by different certificates have been commingled. A label on each bag of insulation eliminates this practical difficulty.

Both the certification label and the separate certificate are required to include the date of manufacture, expressed by day, month, and year. The Commission has proposed the requirement to indicate the day of manufacture, since the Commission has information indicating that the ability of a manufacturer's product to meet the requirements of the standard may change from one day to the next. If the day of manufacture is indicated, manufacturers whose insulation is subject to a recall should be able to confine the recall to the specific insulation that has been improperly certified or found to present a substantial product hazard under section 15 of the CPSA.

The Commission does not believe that stamping each bag of insulation with the day of manufacture will present any great technical or economic problems for manufacturers. However, the Commission solicits comments on this question.

There is another issue involving certificates of compliance with the Commission is particularly interested in receiving comments on. With regard to insulation sold in bags or containers, the Commission notes that distributors and retailers might prefer to be provided with a separate certificate for insulation they receive in addition to the certification label. Distributors and retailers can retain a separate certificate after they have sold the certified products and can produce a certificate as a defense in any enforcement action for violation of the standard. Without a separate certificate, distributors and retailers might want to maintain their own records indicating that the products they received and sold were labeled as complying. Of course, distributors and retailers can either keep their own records or can contractually obtain the separate certificate from the person who provides them with the insulation. However, the Commission is considering requiring the issuance of separate certificates for insulation sold in bags, in addition to the certification labels, and is interested in receiving comments on this issue.

2. Responsibilities of Private Labelers and Importers

Proposed § 1209.39(b) provides that when a private labeler distributes cellulose insulation subject to the standard under the private labeler's name, the private labeler must issue the certificate of compliance but may rely on the manufacturer's tests to support the certificate. Where the private labeler issues the certificate, however, the private labeler has the responsibility for ensuring that all testing used to support the certificate (even though performed by the manufacturer) has been performed properly with passing or acceptable results and that all records of such tests being held by the manufacturer are accurate and complete.

Proposed § 1209.39(d) contains similar provisions for importers of insulation. The importers are required to issue the certificates of compliance, but may rely on the foreign manufacturer's tests to support the certificates if the records of the tests are maintained in the United States and the importer is resident, or maintains a resident agent in this country. The records must be available in the U.S. to enable Commission investigators to inspect the records and thus, monitor compliance with the certification rule and the standard. Like private labelers, importers who certify are responsible for ensuring that all testing has been performed properly with passing or acceptable results and that all records of the tests are accurate and complete.

3. Multiple Responsibility

Proposed § 1209.40 provides that if there is more than one party (i.e., manufacturer, private labeler, or importer) otherwise subject to the requirements of this proposed rule for certain cellulose insulation, only the party closest to the consumer in the distribution chain need issue a certificate.

Economic Impact of the Proposed Certification Rule

As described earlier in the notice, the proposed certification rule includes requirements for a reasonable testing program as well as recordkeeping and labeling. The Commission does not believe the costs of the proposed rule will be burdensome because while the rule mandates a specified label or separate certificate for bags of insulation, it leaves manufacturers with a great deal of flexibility as to testing and recordkeeping.

Information presently available to the Commission indicates the following costs are associated with the reasonable testing program, recordkeeping, and labeling requirements of the proposed certification rule.

Reasonable testing program. This proposed rule provides that before regular production begins, manufacturers must qualify their cellulose insulation product by testing samples of the product for compliance with the standard. After the product is qualified, the manufacturer must demonstrate with production testing that the insulation being manufactured is substantially similar to the qualified product. The manufacturer determines the types of qualification testing to conduct as well as the types and frequency of production testing.

The costs of meeting the qualification and production testing requirements will obviously differ from firm to firm and will depend on such factors as the cost of equipment for test selected, the frequency of testing, and the need for skilled personnel to conduct the tests selected.

If a manufacturer were to qualify his product by using the specific tests in the standard, the Commission estimates the cost would be under $1,000. The approximate fees of commercial laboratories to conduct the tests in the standard are: (1) settled density, $150; (2) smoldering combustion test, $60–$100; (3) corrosiveness test, $115–$275; (4) critical radiant flux test, $175–$225; and (5) calibration for the critical radiant flux rest, $100. This total cost ranges from $600 to $850, plus shipping and is based on manufacturers being able to qualify their products on the first attempt. Before providing certification labels to firms, most commercial laboratories require manufacturers to participate in the commercial laboratory's complete certification program, which includes at least one on-site inspection, and testing in addition to that required in the standard (for example, testing for thermal resistance, odor emission, starch content, and fungal growth). The cost for this type of program leading to a certification label is approximately $3000.

As noted above, firms will incur varying costs for production testing. The total cost of production testing will depend on the type and frequency of tests and on the frequency of test failures. (If a manufacturer fails a test, proposed § 1209.36 requires that he immediately stop production, take corrective action, and requalify the product for the test that is failed.) This requirement concerning production test failure should not be burdensome to larger firms, which have invested in their own equipment, since these firms could repeat a test almost immediately if there were a failure.

Similar firms may not have the same flexibility to repeat tests and avoid halts in production and therefore, may wish to design their testing programs to include only tests which can be performed quickly.

Although the Commission cannot estimate the frequency of failure because it does not know the tests that firms will use, the Commission emphasizes that the frequency of failure is likely to be reduced as manufacturers gain experience and skill in manufacturing complying products. The frequency of failure may also be reduced by the availability of commercial pre-mix chemical formulations that have recently been developed. These pre-mix chemical formulations are likely to be used by many small firms and could reduce the frequency of failure for these firms.

Recordkeeping requirements. The proposed certification rule at section 1209.38 requires manufacturers, private labelers, and importers to maintain records of each product specification; records demonstrating compliance with the production testing requirements, including a description of the types of production tests conducted and the production interval selected for performance of each test; records of all corrective actions taken; and records indicating exactly which insulation material is covered by each certificate issued. The proposed certification rule requires that the records be maintained for a two year period. The Commission does not believe that the recordkeeping costs will be significant, since manufacturers are presently maintaining records to demonstrate that they are conducting a reasonable testing program to comply with the present interim standard. The proposed certification rule allows manufacturers a great deal of latitude in the format of their recordkeeping so that most manufacturers should be able to incorporate certification recordkeeping into their present systems will little difficulty.

Labeling requirements. Section 1209.39(a)(1) of the proposed certification rule requires manufacturers of cellulose insulation whose product is sold in bags or similar containers to certify compliance with the standard with a label on each bag or container. The label must include the statement: "This product meets the amended CPSC standard (effective October 16, 1979) for flame resistance and corrosiveness of cellulose insulation." The label must also include the name of the manufacturer or private labeler or importer issuing the certificate, the date of manufacture by day, month, and year, and the place of manufacture.

The Commission believes that the labeling requirements of the certification rule will have a minimal economic impact on manufacturers. The label statement that the product meets the amended CPSC standard is the same as the label statement that would be required by the proposed amendment. The Commission believes that the proposed effective date of October 16, 1979 will allow many manufacturers time to draw down inventories of bags without these labels and thereby avoid the need for hand-stick-on labels. In the case where inventories are not depleted by October 16, 1979 and hand-stick on labels are used, the Commission estimates that these labels would add approximately 2½ cents to the cost of each bag of insulation, as well as an application cost of at most 4 cents per bag during the limited production period.

The Commission does not believe there are significant costs associated with requiring manufacturers to include on the label the name of the manufacturer, the date of manufacture by day, month, and year, and the place of manufacture. The Commission believes that many manufacturers presently include the name of the manufacturer and the place of manufacture on the label. The date of manufacture could be stamped on each bag before or after the bag is filled with insulation. The date of manufacture and place of manufacture may be included on the label in code.

For those few instances where cellulose insulation is not sold in bags or containers, the proposed certification rule provides that the certificate of compliance must necessarily be in the form of a document which is separate from the product. The separate document could be an invoice, bill, or other statement and must accompany the shipment or delivery of insulation that is not sold in bags. The separate document must contain the same information that the certification rule requires to be included on the label of insulation sold in bags. The Commission does not believe that this requirement of a separate document would present a significant burden to manufacturers, since the rule provides a great deal of flexibility as to the format of the separate document. The separate document requirement could be satisfied by including this information in a bill or invoice that already accompanies the product.

The Commission believes that the certification rule, as proposed, would have a minimal impact on the price of the product to consumers. Since firms may, within certain parameters, define their own reasonable testing programs, firms may be able to keep certification costs low enough to eliminate the need to pass on any costs to consumers.

The Commission notes that demand for cellulose insulation dropped significantly in 1978 and that from 200-300 firms left the industry in that one year. If demand does not pick up soon, additional firms may leave the industry. The Commission believes that if this occurs, it will be because of the demand situation and not as a result of the proposed certification rule which is intended to be flexible enough to accommodate the needs of both the largest and the smallest firms.

Environmental Considerations

The Commission has conducted an environmental assessment of the proposed amendment to the cellulose insulation standard. Based on that assessment (copies of which are available in the Office of the Secretary of the Commission), the Commission concluded that the proposed amendment would have no significant effect on the environment. The Commission believes that this proposed rule concerning certification of compliance with the amended standard will also have no significant impact on the environment.

The amendment and certification rule, if adopted, could have the following potential environmental impacts: (1) fewer homes may be insulated, if the supply of cellulose insulation is reduced and substitute types of insulation are not made available, thus leading to a decrease in energy savings; (2) there may be an increase in the amount of urea-formaldehyde foam insulation used, to make up for any decrease in the use of cellulose insulation; and (3) there may be a need to expand boric acid production, if the proposed amendment and certification rule would result in a shortage of boric acid for use as a flame retardant in cellulose insulation. However, the Commission does not believe that any of these potential effects are likely to occur since the amendment and certification rules are unlikely to adversely affect the availability or use of cellulose insulation.

The Commission does not believe that consumer demand for cellulose insulation will be affected by the amendment or certification rule. The industry is further capable of supplying sufficient insulation to meet current and foreseeable demand for cellulose insulation. Because of this capacity, it is also expected that little substitution of urea-formaldehyde foam insulation for cellulose insulation will occur. Additionally, since the certification rule will not affect the amount of cellulose insulation produced, the rule will not cause an expansion of boric acid production.

In addition, it should be noted that the Commission's interim rules for

carrying out its responsibilities under the National Environmental Policy Act (see 16 CFR Part 1021; 42 FR 25494) provide that product certification or labeling rules normally have no potential for affecting the environment. Therefore, environmental review of such rules is generally not required. (§ 1021.5(b)(2)).

With respect to this cellulose insulation certification rule, the Commission finds that the proposed rule will have no significant effect on the human environment and that no further environmental review of the proposal is necessary.

CONCLUSION AND PROPOSAL

Having considered the need for and the economic impact of the certification requirements set forth below, the Commission concludes that the proposed requirements are reasonable and not unduly burdensome in light of the need for the rule. Therefore, pursuant to sections 14 and 16 of the CPSA (15 U.S.C. 2063 and 2065), the Commission proposes to amend Title 16, Chapter II, Subchapter B, by adding a new Subpart B to Part 1209, reading as follows:

PART 1209—AMENDED INTERIM STANDARD FOR CELLULOSE INSULATION

Subpart B—Certification

Sec.

AUTHORITY: Secs. 14, 16; 86 Stat. 1220, 1222; (15 U.S.C. 2063, 2065).

Subpart B—Certification

§ 1209.31 Purpose and applicability.

(a) *Purpose.* The purpose of this Subpart B of Part 1209 is to establish requirements that manufacturers, importers, and private labelers must follow to certify that their products comply with the Amended Interim Standard for Cellulose Insulation (16 CFR Part 1209, Subpart A). This Subpart B includes requirements for conducting a reasonable testing program, certifying with label and separate certificates, and recordkeeping.

(b) *Applicability.* (1) Cellulose insulation which is subject to the standard includes all cellulose insulation produced or distributed for sale to, or for the personal use, consumption, or enjoyment of, consumers in or around a permanent or temporary household or residence, a school, in recreation or otherwise. The standard applies to cellulose insulation that is produced or distributed for sale to consumers, for their direct installation or use, as well as cellulose insulation that is produced or distributed for installation by professionals.

(2) The term "cellulose insulation" is defined in § 1209.2(a) of the standard to mean cellulosic fiber, loose fill, thermal insulation that is suitable for blowing or pouring applications. The definition of cellulose insulation in the standard includes cellulose insulation installed using the "wet process" method of installation. The "wet process" insulation is blown into an area with a spray or mist of water applied at the nozzle during installation.

§ 1209.32 Definitions.

In addition to the definitions set forth in section 3 of the act and in § 1209.2 of the standard, the following definitions shall apply to this Subpart B of Part 1209:

(a) "Private labeler" means an owner of a brand or trademark which is used on the label of cellulose insulation subject to the standard which bears a private label as defined in section 3(a)(7) of the act (15 U.S.C. 2052(a)(7)).

(b) "Production interval" means a time span determined by the manufacturer, private labeler, or importer to be appropriate for conducting a test or series of tests on samples of the cellulose insulation being produced to demonstrate that the product meets the requirements of the standard. An appropriate production interval may vary from test to test. The time period for a production interval shall be short enough to ensure that if the samples selected for testing comply with the standard or a portion of the standard, the insulation produced during the period will meet the standard or the appropriate portion of the standard.

§ 1209.33 Reasonable testing program.

(a) *General.* Section 14(a) of the Consumer Product Safety Act (15 U.S.C. 2063(a)) requires each manufacturer, importer, or private labeler of a product which is subject to a consumer product safety standard to issue a certificate of compliance with the applicable standard and to base that certificate upon a test of each item or upon a reasonable testing program. Because it is not practical to test each item subject to the standard, a reasonable testing program shall be used to support certificates of compliance for cellulose insulation.

(b) *Requirements of testing program.* A reasonable testing program for cellulose insulation is one which demonstrates that the insulation complies with the standard. Manufacturers, private labelers, and importers shall determine the types and frequency of testing for their own reasonable testing programs. However, all reasonable testing programs shall consist of four elements:

(1) Qualification tests which must be performed on samples of the manufacturer's cellulose insulation to demonstrate that the product is capable of passing the tests prescribed by the standard.

(2) A description of the cellulose insulation which passed the qualification testing. This description is known as the "product specification."

(3) Production tests, which must be performed at appropriate production intervals as long as the cellulose insulation is being manufactured.

(4) Corrective action, which must be taken whenever samples of the cellulose insulation yield unacceptable or failing test results.

(c) *Commission testing.* The Commission will test for compliance with the standard by using the test procedures contained in the standard. However, a reasonable testing program may include either tests prescribed in the standard or any other reasonable test procedures.

(d) *Testing by third parties.* At the option of the manufacturer, importer, or private labeler, some or all of the testing for the reasonable testing program may be performed by an independent third party qualified to perform such tests. However, the manufacturer, importer, or private labeler is responsible for ensuring that all testing used to support the certificate of compliance has been properly performed with passing or acceptable results and for maintaining all records of such tests in accordance with § 1209.38 below. Such additional testing shall be applicable in determining if the cellulose insulation may be certified as being in compliance with the standard, and the test results shall be incorporated into the manufacturers' records.

§ 1209.34 Qualification testing.

(a) *Requirement.* Before any manufacturer, importer, or private labeler begins distribution in commerce of cellulose insulation which is subject to the standard, samples of the insulation shall be tested for compliance with the standard. Manufacturers, importers, and private labelers shall determine the types of tests for qualification testing.

(b) *Timing, sampling.* Any or all of the qualification testing required by this § 1209.34 may be performed before the effective date of the standard. Manufacturers, private labelers, or importers may select samples for qualifi-

cation testing of a product in any manner they desire.

§ 1209.35 Product specification.

(a) *Requirement.* Before any manufacturer, importer, or private labeler distributes in commerce cellulose insulation which is subject to the standard, he or shall shall ensure that the insulation is described in a written product specification.

(b) *Contents of specification.* The product specification shall include the following information:

(1) A description of the equipment used to manufacture the insulation, including the model number and names of the equipment manufacturers, and details of any modification made to any item of equipment.

(2) A description of the cellulosic stock material used to manufacture the insulation, identifying the extent of impurities allowed.

(3) The formulation of the fire-retardant chemicals added, including their chemical constituents and their form (for example, granulated or powdered); the amount of fire-retardant chemicals present in the finished insulation, expressed as a percentage of the total weight of chemicals and cellulosic stock; the average weight of chemicals per bag; and the name and address of each chemical supplier.

(4) A description of the tests which were used to qualify the product as well as the dates of performance and results and actual values, where applicable, of the tests.

(5) Any other information necessary to describe the insulation.

(c) *Distribution in Commerce.* After the qualification testing required by § 1209.34 has been completed with acceptable results and the product specification required by this § 1209.35 has been recorded, the cellulose insulation may be manufactured and distributed in commerce, subject to the provisions of § 1209.36.

(d) *New Product.* Whenever a manufacturer, private labeler, or importer makes any change to any item of equipment, cellulosic stock material, or formulation of a fire retardant chemical, or any other factor which is likely to affect the ability of the cellulose insulation to meet the standard, that change will result in a new cellulose insulation product, requiring the preparation of a new product specification. The new product must be subjected to qualification tests and must yield passing or acceptable results.

§ 1209.36 Production testing.

(a) *General.* Manufacturers, private labelers, and importers shall test the cellulose insulation periodically as it is manufactured to demonstrate that the product being manufactured is substantially similar to the product which passed the qualification testing and to demonstrate that the product being manufactured meets the requirements of the standard.

(b) *Types and frequency of testing.* Manufacturers, private labelers, and importers shall determine the types of tests for production testing. Each production test shall be conducted at a production interval short enough to ensure that if the samples selected for testing meet the standard or a portion of the standard, the insulation produced during the interval will also meet the standard or the appropriate portion of the standard.

(c) *Test failure.* If any test yields failing results, production must cease and the faulty manufacturing process corrected. (see § 1209.37). In addition, the material from which the samples were taken may not be distributed in commerce unless the material can be corrected (see § 1209.37) so as to yield passing results and meet the standard. Cellulose insulation that does not comply with the standard cannot be sold or offered for sale.

§ 1209.37 Corrective actions.

(a) *Test failure.* When any test required by § 1209.36 yields failing or unacceptable results, corrective action must be taken, Corrective action includes changes to the manufacturing process as well as reworking the insulation product itself. Corrective action may consist of equipment adjustment, equipment repair, equipment replacement, change in chemical formulation, change in chemical quantity, change in cellulosic stock, or other action deemed appropriate by the manufacturer, private labeler or importer to achieve passing or acceptable test results.

(b) *New product.* If any corrective action required this the § 1209.37 results in a change of the product specification and a new cellulose insulation product (see § 1209.34(b)), the product specification for the new product must be recorded in accordance with § 1209.35, and qualification tests must be performed with passing or acceptable results in accordance with § 1209.34 before the new product is distributed in commerce.

§ 1209.38 Records.

(a) *Establishment and maintenance.* Each manufacturer, importer, and private labeler of cellulose insulation subject to the standard shall establish and maintain the following records which shall be available to any designated officer or employee of the Commission upon request in accordance with section 16(b) of the act (15 U.S.C. 2965(b)):

(1) A record of each product specification containing all information required by § 1209.35.

(2) Records to demonstrate compliance with the requirements for production testing in § 1209.36, including a description of the types of production tests conducted and the production interval selected for performance of each production test.

(3) Records of all corrective actions taken in accordance with § 1209.37, including the specific action taken, the date the action was taken, and the test failure which necessitated the action, Records of corrective action must relate the corrective action taken to the product specification of the insulation product which was the subject of that corrrective action, and the product specification of any new product which results from any corrective action.

(4) Records indicating exactly which insulation material is covered by each certificate of compliance issued.

(b) *Retention*—(1) *Product specification.* The records of each product specification shall be retained for as long as the cellulose insulation covered by that specification is manufactured and for a period of two (2) years thereafter.

(2) *Other records.* Records of production testing, corrective actions taken, and certificates issued shall be maintained for a period of two (2) years.

§ 1209.39 Certification of compliance.

(a) (1) *Responsibilities of manufacturer for insulation sold in bags.* Manufacturers of cellulose insulation subject to the standard which is sold in bags or similar containers shall certify compliance with the standard with a label on each bag or container which contains the following information (This label may be the same label provided in § 1209.9 of the standard):

(i) The statement "This product meets the amended CPSC standard (effective October 16, 1979) for flame resistance and corrosiveness of cellulose insulation."

(ii) The name of the manufacturer, private labeler, or importer issuing the certificate of compliance. See §§ 1209.39 (b) and (c), below.

(iii) The date of manufacture by day, month, and year.

(iv) The place of manufactuer, by city, state, and zip code, or in the case of products manufactured outside the United States, by city and country.

The information required by this § 1209.39(a) shall be permanent and conspicuous on the bag or container, and must appear in letters and figures at least ¼ inch in height. The date and place of manufacture may be in code, provided the person or firm issuing the certificate maintains a written record of the meaning of the code that can be made available to consumers, persons in the chain of distribution, and the Commission upon request.

(2) *Insulation not sold in bags or containers.* The manufacturer of cellulose insulation subject to the standard which is not sold in bags or similar containers shall certify compliance with the standard by accompanying each shipment or delivery of the product, with a document such as an invoice, bill, statement, or separate document, which states the following: "This product meets the amended CPSC standard (effective October 16, 1979) for flame resistance and corrosiveness of cellulose insulation. This material was manufactured on (insert day, month, and year of manufacture) at (insert city, state, and zip code, or in the case of insulation manufactured outside the United States, city and country)." The certificate of compliance must also contain the name of the manufacturer, private labeler, or importer issuing the certificate. See §§ 1209.39 (b) and (c), below. The certificate of compliance must appear in letters and figures which are conspicuous and legible. The date and place of manufacture may be in code, provided the person or firm issuing the certificate maintains a written record of the meaning of the code that can be made available to consumers, persons in the chain of distribution, and the Commission upon request.

(b) *Responsibilities of private labelers.* A private labeler who distributes a product subject to the standard which is manufactured by another person or firm but which is sold under the private labeler's name, brand, or trademark must issue the certificate of compliance required by section 14 of the Consumer Product Safety Act and this § 1209.39. If the testing required by this Subpart B of Part 1209 has been performed by or for the manufacturer of the product, the private labeler may rely on any such tests to support the certificate of compliance if the records of such tests are maintained in accordance with § 1209.38, above. The private labeler is responsible for ensuring that all testing used to support the certificate of compliance has been performed properly with passing or acceptable results, and that all records of such tests are accurate and complete.

(c) *Responsibilities of importers.* The importer of any product subject to the standard must issue the certificate of compliance required by section 14(a) of the act and this § 1209.39. If the testing required by this Subpart B of Part 1209 has been performed by or for the overseas manufacturer of the product, the importer may rely on any such tests to support the certificate of compliance if the importer is a resident of the U.S. or has a resident agent in the U.S. and the records are maintained in the U.S. in accordance with § 1209.38 above. The importer is responsible for ensuring that all testing used to support the certificate of compliance has been performed properly with passing or acceptable results, and that all records of such tests are accurate and complete.

§ 1209.40 Certification responsibility, multiple parties.

If there is more than one party (i.e., manufacturer, private labeler, or importer) otherwise subject to the requirements of this Subpart B of Part 1209 for certain cellulose insulation, only the party closest to the consumer in the distribution chain is required to issue a certificate.

§ 1209.41 Effective date.

The requirements of this Subpart B of Part 1209 shall become effective on October 16, 1979. Any cellulose insulation manufactured after October 15, 1979 must be certified as complying with the standard.

PROCEDURE FOR SUBMITTING COMMENTS

Comments regarding this proposal for issuing a certification rule must be received by April 9, 1979. Comments should be accompanied, to the extent possible, by supporting data or documentation. Requests for confidentiality of documentation will be handled in accordance with the Freedom of Information Act as amended (5 U.S.C. 552), the Commission's regulations under that act (16 CFR Part 1015, February 22, 1977), and the provisions of section 6(a)(2) of the CPSA (15 U.S.C. 2055(a)(2)).

Written submissions and any accompanying data or material should be submitted, preferably in five copies, addressed to the Secretary, Consumer Product Safety Commission, Washington, D.C. 20207.

All written comments that are received, and all other material which the Commission has that is relevant to this proceeding may be seen in, or copies obtained from, the Office of the Secretary, Third Floor, 1111 18th Street, N.W., Washington, D.C. 20207.

(Secs. 14, 35(c)(2), Pub. L. 92-573, Pub. L. 95-319, 86 Stat. 1220-1221, 92 Stat. 388-389; (15 U.S.C. 2063, 2082).)

Dated: March 2, 1979.

SADYE E. DUNN,
Secretary, Consumer Product Safety Commission.

[FR Doc. 79-6864 Filed 3-7-79; 8:45 am]

[6355-01-M]

[16 CFR Part 1209]

INTERIM STANDARD FOR CELLULOSE INSULATION

Proposed Amendment

AGENCY: Consumer Product Safety Commission.

ACTION: Proposed amendment to standard.

SUMMARY: In this document the Commission proposes to amend its interim safety standard that addresses the flammability and corrosiveness of cellulose insulation. A recently enacted law required the Commission to publish that standard, which is based on a General Services Administration (GSA) specification for cellulose insulation. The law also requires the Commission to propose as amendments to its standard any related revisions GSA makes to its specification. Therefore, the Commission is proposing this amendment, which is based on a GSA revision that became effective on June 15, 1978.

DATE: Comments must be reveived by April 9, 1979.

Under the proposal, cellulose insulation manufactured after October 15, 1979 would have to comply with the requirements of the standard as revised, including the labeling requirement.

The Commission must publish an amendment or withdraw the proposal by June 29, 1979.

ADDRESS: Comments should be titled *Cellulose Insulation: Proposed Amendment to the Interim Standard* and should be submitted to the Office of the Secretary, CPSC, Washington, D.C. 20207. Received comments and other information on this proceeding may be viewed in the Office of the Secretary, CPSC, 1111 18th Street NW., Third Floor, Washington, D.C.

FOR FURTHER INFORMATION: CONTACT:

Harry I. Cohen, Program Manager, Office of Program Management, CPSC, Washington, D.C. 20207, 301-492-6453.

SUPPLEMENTARY INFORMATION

I. BACKGROUND

On July 11, 1978, the "Emergency Interim Consumer Product Safety Standard Act of 1978," Pub. L. 95-319, became law. This legislation amended the Consumer Product Safety Act (CPSA) (15 U.S.C. 2051 et seq.) by adding a new section, section 35, that required the Commission to issue an interim consumer product safety standard for cellulose insulation based on the requirements for flame resis-

tance and corrosiveness in the General Service Administration Specification HH-I-515C, as effective February 1, 1978.

Pursuant to the statute, the Commission, on August 8, 1978, published the interim consumer product safety standard addressing the flame resistance and corrosiveness of cellulose insulation (43 FR 35240). The interim standard became effective September 8, 1978, so that insulation manufactured after September 7, 1978, must comply with the standard.

The "Emergency Interim Consumer Product Safety Standard Act of 1978" also provides that until a final consumer product safety standard is in effect, the Commission must publish for public comment amendments to the interim standard to incorporate each revision GSA issues that supersedes the requirements for flame resistance and corrosiveness in GSA Specification HH-I-515C. The Commission may make appropriate changes in the GSA revisions before proposing the amendment for public comment. The Commission must issue the amendment unless the Commission determines, after consulting with the Secretary of Energy, that the amendment is not necessary to protect consumers from the unreasonable risk of injury associated with flammable or corrosive cellulose insulation or that implementation of the amendment will create an undue burden on persons who are subject to the interim consumer product safety standard.

The General Services Administration has informed the Commission that, effective June 15, 1978, it has issued GSA Specification HH-I-515D. Since this specification contains requirements for flame resistance and corrosiveness for cellulose insulation that supersede the requirements of GSA Specification HH-I-515C, the Commission is required by Pub. L. 95-319 to publish the flame resistance and corrosiveness provisions of HH-I-515D as a proposed amendment to the interim standard.

After the proposed amendment has been published, the act provides 30 days for interested persons to submit comments. Within 90 days after the end of the 30-day public comment period, the Commission must either publish the amendment as a final amendment or withdraw the proposal.

The Commission extended, for 150 days, from August 24, 1978, until January 22, 1979, the time in which it must publish the proposed amendment to the interim standard (43 FR 35238, August 8, 1978). The purpose of this extension was to provide the Commission with additional time to study the technical and scientific basis and the safety and economic consequences of the requirements of HH-I-515D. The Commission further extended the January 22, 1979 date by 45 days, so that the Commission must now publish the proposed amendment by March 8, 1979 (44 FR 3989, January 19, 1979). On September 6, 1978, the Commission published a notice of intent to propose an amendment to the interim standard (43 FR 39720). The notice of intent included the flame resistance and corrosiveness provisions of HH-I-515D and solicited comments on these provisions and related issued. These comments are discussed in the section of this preamble titled: *IV. Response to Comments Received Concerning the Notice of Intent.*

In addition to publishing the proposed amendment, the Commission has published elsewhere in this issue of the FEDERAL REGISTER a proposed certification rule under section 14 of the CPSA (15 U.S.C. 2063). That rule would prescribe requirements that manufacturers and private labelers would have to follow to certify that their cellulose insulation complies with the requirements of the amended standard. The Commission hopes to make that rule final at the same time it issues the amendment to the standard, in order to provide guidance. However, section 14 of the CPSA requires manufacturers and private labelers to certify that their products comply with a safety standard, even if the Commission has issued no certification regulation. The Commission has also published a proposed rule under section 27(e) of the CPSA (15 U.S.C. 2076(e)) that would require manufacturers of cellulose insulation to include labeling on their product concerning the proper installation of cellulose insulation to prevent fires (43 FR 59390, December 20, 1978).

II. DESCRIPTION OF THE PROPOSED AMENDMENT

The amendment to the interim standard, 16 CFR Part 1209, as proposed below, would prescribe flame resistance and corrosiveness requirements for cellulose insulation manufactured for use as a consumer product. The amendment to the interim standard would apply to all such cellulose insulation manufactured after October 15, 1979. Cellulose insulation manufactured before October 16, 1979 but after September 7, 1978 must continue to comply with the interim standard based on HH-I-515C. The requirements of the proposed amendment are intended to reduce or eliminate an unreasonable risk of injury to consumers from flammable and corrosive cellulose insulation.

As provided by Pub. L. 95-319, the proposed amendment contains the flame resistance and corrosiveness provisions of GSA Specification HH-I-515D (with several changes discussed below), since these provisions supersede the requirements for flame resistance and corrosiveness in GSA Specification HH-I-515C.

The Commission has not included the following paragraphs of HH-I-515D in the proposed amendment since these paragraphs do not contain provisions superseding the requirements for flame resistance and corrosiveness in GSA Specification HH-I-515C: Paragraph 1, *Scope and Classification;* paragraph 2, *Applicable Documents;* paragraph 3, *Requirements;* 3.1 *Material;* 3.1.1 *Qualification;* 3.1.3 *Starch;* 3.1.4 *Thermal Resistance;* 3.1.5 *Moisture Absorption;* 3.1.6 *Odor Emission;* 3.1.8 *Fungi Resistance;* 3.2 *Marking;* 3.2.3. *Workmanship;* paragraph 4, *Quality Assurance Provisions;* 4.1 *Responsibility for Inspection;* 4.2 *Classification of Inspections;* 4.3 *Qualification Tests;* 4.4 *Sampling for Qualification Tests;* 4.5 *Quality Assurance Inspection;* 4.6 *Sampling;* 4.7 *Examination Tests;* 4.8.2 *Thermal Resistance;* 4.8.3 *Moisture Absorption;* 4.8.4 *Odor Emission;* 4.8.6 *Fungi Resistance;* 4.8.9 *Starch;* 4.9 *Quality Assurance Test Methods;* 4.9.3 *Thermal Resistance;* paragraph 5, *Preparation for Delivery;* paragraph 6, *Notes.*

A. SCOPE AND APPLICATION

Section 1209.1 of the amended interim standard describes its scope and application. The amended interim standard contains requirements based on GSA Specification HH-I-515D that are intended to reduce or eliminate an unreasonable risk of injury to consumers from flammable and corrosive cellulose insulation.

As does the current interim standard, the amended interim standard would apply to cellulose insulation that is a consumer product, that is, insulation produced or distributed for sale to or for the personal use, consumption, or enjoyment of consumers in or around a permanent or temporary household or residence, a school, in recreation, or otherwise. The amended interim standard would apply to cellulose insulation that is produced or distributed for sale to consumers for their direct installation or use, as well as insulation that is produced or distributed for installation by professionals. As required by section 9(d)(1) of the act (15 U.S.C. 2058(d)(1)), the amended interim standard would apply only to cellulose insulation manufactured on or after the effective date of the amendment (proposed as October 16, 1979).

B. DEFINITIONS

Section 1209.2(a) of the proposed amendment defines the consumer product covered by the amended interim standard. For purposes of the amended interim standard, "cellulose

insulation" means cellulosic fiber, loose fill, thermal insulation that is suitable for blowing or pouring applications. Like the present interim standard, the definition includes insulation installed using the "wet process" method of installation. ("Wet process" insulation is blown into an area with a spray or mist of water applied at the nozzle during installation.) The definition does not specifically exclude insulation installed using a spray-on process with wet or dry adhesives. However, if the Commission receives information indicating that there is no need to include insulation installed using a spray-on adhesive process, or if the Commission receives information indicating that the test methods of the proposed amendment are not applicable to insulation installed using a spray-on adhesive process, the Commission will specifically exclude these types of insulation. Interested persons are encouraged to comment on the definition of cellulose insulation at § 1209.2(a) of the proposed amendment.

C. CORROSIVENESS PROVISIONS

The proposed amendment includes requirements and test procedures for the corrosiveness of insulation. (See §§ 1209.3(a) and 1209.5 of the proposed amendment.) As provided by Pub. L. 95-319, these provisions are based on the corrosiveness provisions of GSA specification HH-I-515D, which revised the corrosiveness provisions of GSA specification HH-I-515C. The Commission has made several changes in the provisions, as discussed below. The test method of the proposed amendment provides that insulation test specimens are saturated with distilled or deionized water and are placed in contact with a thin metal coupon. Aluminum, copper, and steel coupons are used. The saturated insulation and metal coupon assembly (also referred to as a composite specimen) is placed in a humidity chamber at high temperature and high relative humidity for 14 days. Subsequently, the coupons are removed from the composites, cleaned, and examined over a light bulb for perforations. If any metal coupon is observed to have any perforation (excluding notches which extend into the coupon 1 mm or less from any edge), then the insulation fails the corrosiveness requirement.

The corrosiveness test method of the present interim standard differs from the test method of the proposed amendment in the procedure for preparing the metal coupons and insulation specimens, the type of coupons used in the test, the amount of time the specimens are left in the humidity chamber, and the coupon post-cleaning. The proposed amendment would require that the corrosiveness test method and the smoldering combustion test method (described below) be conducted using the results of the measured settled density of the cellulose insulation. At section 1209.4 the proposed amendment includes a test procedure for determining settled density. This test method for determining settled density uses a cyclone-shaker and is different than the blown density test method in the current interim standard (at § 1209.7). As explained in section III of this preamble concerning Commission proposed changes, the cyclone-shaker test method is also different from the test method for determining settle density at paragraph 4.8.1 of HH-I-515D.

D. FLAME RESISTANCE PROVISIONS

The proposed amendment would supersede the flame resistance provisions of the present interim standard by replacing these provisions with two new requirements and procedures for determining flame resistance: the requirement and test procedures for critical radiant flux (see §§ 1209.3(b) and 1209.6 of the proposed amendment) and the requirement and test procedures for smoldering combustion (see §§ 1209.3(c) and 1209.7 of the proposed amendment).

The present interim standard based on HH-I-515C requires cellulose insulation to have a flame spread rating not greater than 25 when tested in a Steiner tunnel. Insulation must also pass a flame resistance permanency test that uses the Steiner tunnel and a smaller, two foot, version of the tunnel. The tunnel test measures how quickly a given material burns. The proposed amendment would replace the tunnel test with the attic floor radiant panel and smoldering combustion tests. These two tests evaluate the fire performance of cellulose insulation by specifying both open flame and smoldering ignition sources in an attempt to better simulate real-life conditions.

The attic floor radiant panel test is designed to measure the potential of a material to propagate open flames across its surface. To accomplish this, the test uses a panel to generate heat which is directed toward the surface of the test specimen. The amount of heat received by the specimen decreases as the distance from the heat source increases. The specimen is ignited at the hot end by a small pilot burner; and, if the flames propagate, the specimen burns toward the cool end. After the flames have extinguished, the person conducting the test measures the extent of burning present on the specimen. The person conducting the test then converts and reports this measurement as "critical radiant flux." The proposed amendment would require all test specimens to have a critical radiant flux equal to or greater than 0.12 W/cm^2 in order to pass the test. At § 1209.8 the proposed amendment includes a procedure for calibrating radiation instrumentation used in the test procedure for critical radiant flux.

The requirements and test procedures for smoldering combustion in the proposed amendment are designed to determine the potential of a material to undergo sustained smoldering combustion when exposed to a moderate heat source. A lit cigarette (lit end up) is placed in a small specimen of conditioned insulation (at settled density) in a stainless steel box. The specimen holder is weighed before the test. The cigarette and specimen are allowed to burn for at least two hours or until the smoldering has ended. After the smoldering has ended, the specimen holder and any residue are weighed, and the percent weight loss of the original specimen is calculated. In order to pass the requirements of the proposed amendment for smoldering combustion, the insulation must have no evidence of flaming combustion and a weight loss of 15 percent or less of the initial weight of each of the specimens tested.

The proposed amendment does not include the flame resistance permanency requirements and test procedures of the present interim standard, since flame resistance permanency has been eliminated from the revised GSA Specification HH-I-515D.

E. LABELING PROVISIONS

The present interim standard, at § 1209.9, requires manufacturers and private labelers to place the following statement on their containers of cellulose insulation: "Attention: This material meets the applicable minimum Federal flammability standard. This standard is based upon laboratory tests only, which do not represent actual conditions which may occur in the home." As provided by Pub. L. 95-319, this label requirement remains in effect only during the period in which the interim standard based on HH-I-515C is in effect. The proposed amendment, at § 1209.9(a), includes a label requirement to enable persons to distinguish insulation that meets the requirements of the amended standard. The label, as proposed, states: "This product meets the amended CPSC standard (effective October 16, 1979) for flame resistance and corrosiveness of cellulose insulation." This label requirement would replace the label requirement of the present interim standard.

The proposed amendment provides that manufacturers may use any type of label, including a pressure sensitive or glued on label, to meet this require-

ment, provided the label is made and attached in such a manner that it will be legible for the expected amount of time between the manufacture of the product and its installation. The proposed amendment, at § 1209.9(b), specifies the size of the label and requires the label to be printed in legible type in a color which contrasts with the background on which the statement is printed. Unlike the present interim standard, which included a reference to CPSC regulations under the Federal Hazardous Substance Act for designing a label that is prominent and conspicuous, § 1209.(b) specifies the size of the label in order to eliminate confusion.

F. CERTIFICATION AND ENFORCEMENT

As explained in § 1209.10(a), section 14 of the CPSA (15 U.S.C. 2063) requires any manufacturer or private labeler of a product subject to a standard to certify that the product conforms to the standard. The certification must be based on either a test of each product or a reasonable testing program. Elsewhere in this issue of the FEDERAL REGISTER, the Commission has proposed a certification rule that provides certification requirements. The Commission hopes to issue that regulation in final form at the same time the Commission issues a revised standard. However, even if the Commission does not issue a final certification rule, section 14 of the CPSA requires manufacturers and private labelers to certify their products.

As explained at § 1209.10(b), if the proposed amendment is adopted, the Commission intends to use the test procedures in the proposed amendment to determine whether insulation complies with the standard.

G. EFFECTIVE DATE

At § 1209.11, the proposed amendment provides that all cellulose insulation that is a consumer product and that is manufactured after October 15, 1979, must meet the requirements of the amended standard. The Commission believes that this effective date is reasonable since it will allow manufacturers time to meet the requirements of the amendment, including the labeling requirements. If the Commission decides to adopt the amended standard, the Commission must do so and publish the amended standard by June 29, 1979. Manufacturers would have the time from June 29, 1979 through October 15, 1979 to comply with the requirements of the amendment. Persons who believe that a different effective date should be chosen should comment on this issue and should present information showing why the proposed effective date is not reasonable. Persons commenting on this issue should also indicate what other effective dates would be reasonable, and present information supporting their position.

III. COMMISSION PROPOSED CHANGES TO THE FLAME RESISTANCE AND CORROSIVENESS PROVISIONS OF HH-I-515

Section 35(c)(2)(C) of Pub. L. 95-319 authorizes the Commission to make changes in the flame resistance and corrosiveness provisions of HH-I-515D in order to make these provisions suitable for issuance as an amendment to the interim standard. The legislative history of the act indicates that the Commission could modify the existing test methods in HH-I-515D or develop a new test method for flame resistance or corrosiveness in order to ensure reproducible results, adequately simulate a home situation, or deal with a problem that is not adequately addressed by the GSA revision. The Commission may also make technical nonsubstantive changes, such as numbering changes, correction of typographical errors, and the addition of tolerances, to ensure that the revision is suitable for issuance as a mandatory product safety rule (H.R. REPT. No. 95-1322; 95th Cong., 2d sess. 13(1978) and H.R. REPT. No. 95-1116; 95th Cong., 2nd sess. 7-8(1978)). The Commission describes below the proposed changes along with the reasons for the proposed changes.

The Commission encourages interested persons to comment on these proposed changes.

Test procedures for determining settled density (1209.4). at § 1209.4(a)(1), the Commission has substituted a new test apparatus and procedure for determining settled density in place of the test apparatus and procedure described at paragraph 4.8.1 of HH-I-515D. The new test method, the cyclone-shaker test method, was recommended by the Department of Energy after the Department of Energy conducted comparison studies between this test method and the settled density test method of HH-I-515D.

The CPSC engineering laboratory conducted comparison tests between the present test method of HH-I-515D (with slightly modified temperature and humidity conditions) and the cyclone-shaker test method of the proposed amendment. The tests indicated that there were only minimal differences between results obtained using the two test methods. The Commission has no evidence to indicate that the cyclone-shaker test method is less reproducible or reliable than the test method in HH-I-515D.

The environmental conditioning apparatus presently specified in paragraph 4.8.1 of HH-I-515D is reportedly difficult to obtain and may have to be custom built. The conditioning chamber necessary to reproduce these environmental conditions would be expensive. The conditioning chamber would also have a limited capacity, which would restrict the number of specimens that could be tested during the 28 day conditioning period.

The Commission believes that the change should result in a test procedure that is easier, less expensive, and less time consuming for the manufacturer and testing laboratory. The conditioning requirement in the proposed amendment is identical to the conditioning requirements for the smoldering combustion test and the attic floor radiant panel test, so there is no need to purchase additional equipment for measuring settled density. In addition the proposed change will allow settled density to be determined within a matter of several days instead of the minimum 28 days presently specified in HH-I-515D.

Test procedures for corrosiveness. (1209.5). The Commission has included the following changes in the proposed amendment concerning the test procedures for corrosiveness:

(1) At § 1209.5(a)(1), the Commission proposes that the requirement for the humidity chamber in HH-I-515D be changed to provide for a "forced-air" humidty chamber. As presently described in paragraph 4.8.5 of HH-I-515D, the humidity chamber could be either a forced-air or static-air type. Air circulation in the humidity chamber may affect the evaporation rate of water from saturated insulation as well as the rate of corrosion. To better ensure that all testing laboratories will be using similar humidity chamber systems, and also to eliminate possible variations in test conditions, the Commission has proposed that a forced-air humidity chamber be specified. The Commission believes that most testing laboratories already have available and frequently use such forced-air systems.

(2) Throughout § 1209.5, the Commission has changed the type of dishes for the composite test specimens from "evaporating" to "crystallizing". This change has been made so that the type of dish is consistent with current laboratory practices and with the present interim standard. The change will also allow the test coupons to be centered more easily in the insulation specimens. The change has been made at § 1209.5(a)(2) and at several places in § 1209.5(b) of the proposed amendment.

(3) Throughout § 1209.5, the Commission has changed the term test "specimens" to test "coupons" to describe the thin metal squares that are used to evaluate corrosiveness. This change has been made since the word "coupon" more accurately describes these metal squares and eliminates possible confusion with the "speci-

mens" of cellulose insulation. The change has been at § 1209.5(a)(3), and at several places in § 1209.5(b).

(4) At § 1209.5(a)(4) the Commission has changed the description of the "Insulation Sample" in paragraph 4.8.5 of HH-I-515D to specify that six insulation test specimens shall be used for one test, and that each specimen shall weigh 20 g. This change has been made in order to clarify the number of specimens to be used and to provide a full description of the test specimens at one place in the standard.

(5) At § 1209.5(b) the Commission has included a new procedure for cleaning the metal coupons. The Commission has included this change in the proposed amendment since the cleaning procedures in paragraph 4.8.5 of HH-I-515D may result in incomplete removal of grease and surface contaminants and may lead to poor reproducibility of test results. The cleaning procedure in paragraph 4.8.5 of HH-I-515D, using 1,1,1-trichloroethane alone to clean the metal coupons, is inadequate to achieve the necessary water-break free surface criterion to ensure that the metal coupons are clean. To ensure that the coupons would not be contaminated during handling, the Commission has specified that coupons not be touched by ungloved hands. The Commission has specified that chemicals used in the cleaning process be of at least a certified reagent grade free of oily residue and other contaminants, since different qualities of solvents are available. Solvents that are low grade quality may not effectively clean the metal coupons.

(6) At § 1209.5(b) the Commission has changed the procedure for preparing the insulation test specimens and the description of the method for calculating the quantity of distilled or deionized water to be used with each specimen. These changes are intended to reasonable ensure that homogenious specimens are obtained, thus addressing variability due to possible separation of dry chemicals from the cellulose insulation. The change should improve the reproducibility of the test method.

(7) At § 1209.5(b), the Commission has included a statement providing that care should be taken to avoid evaporation of water from the time when the specimen is being prepared until the time when the specimen is placed in the humidity chamber. The purpose of this change is to minimize possible variations in test results that may occur from evaporation.

(8) At § 1209.5(b), the Commission has included a clarification that the specimen preparation be repeated for all metal coupons to avoid any possible confusion.

(9) At § 1209.5(b) the Commission has changed the amount of time the specimens are to remain in the humidity chamber from 14 days to 336 ± 4 hours to clarify the time frame in which the test is considered to be complete.

(10) At § 1209.5(b) the Commission has included a clarifying statement that any opening of the humidity chamber door be kept to a minimum while the composite specimens are placed in and removed from the humidity chamber. Although it is necessary to open the door of the humidity chamber to put new specimens into the chamber or take tested specimens out of the chamber, opening the doors should be kept to a minimum since opening may lead to fluctuations of the temperature and humidity. Therefore, the purpose of this change is to avoid possible variations in test results that may occur as a result of variations in the controlled temperature and humidity conditions of the humidity chamber.

(11) At § 1209.5(b) the Commission has clarified the test procedure to provide that, after the test is completed, the metal "coupons" should be brushed with a "nylon bristle brush or equivalent" to remove loose corrosion products. The use of the "nylon bristle brush or equivalent" has been included since the use of a hard bristle brush could artifically cause perforations apart from the corrosion test.

(12) At § 1209.5(b) the Commission has changed the procedure for removing the remaining corrosion products from the metal coupons to provide that these coupons be cleaned in accordance with specified practices identified in "ASTM G1—Standard Recommended Practice for Preparing, Cleaning, and Evaluating Corrosion Test Specimens" (American Society for Testing and Materials, 1916 Race Street, Philadelphia, Pa. 19103). The procedure in HH-I-51D for removing corrosion products calls for a simple nitric acid dip. The change proposed by the Commission would allow post-cleaning of the metal coupons by methods which substantially reduce removal of intact metal and provide for more accurate evaluation of the corrosion the test coupons may experience.

(13) At § 1209.5(c) the Commission has changed the procedure for determining noncorrosiveness to exclude notches which extend into the coupon 1 mm or less from any edge. The Commission believes that this change will minimize variations in judgment that may occur in determining noncorrsiveness. These notches do not represent the corrosion potential of the insulation test specimens and should not be used in judging corrosiveness. The notches frequently represent effects on the edges of the coupons accentuated by coupon preparation rather than corrosion from the test specimens.

(14) At § 1209.3(a) and § 1209.5(b) the Commission has changed the procedure for examining the metal coupons to eliminate the requirement that the coupons be examined under a "chrome reflected" light bulb. The reason for this change is that the Commission believes that a 40-W appliance light bulb without a chrome reflector is sufficient for examining test coupons for perforation.

(15) At § 1209.3(a) the Commission has provided that no perforation "of any of the six" 3 mil metal "coupons" shall be evident. The change has been made to clarify that the metal coupons are examined, rather than the specimen of insulation.

(16) Throughout § 1209.5 the Commission has made numerous technical non-substantive changes, such as editorial changes, the addition of tolorances, the use of consistent measurement units and the inclusion of equivalent units, to ensure that the proposed amendment is suitable for issuance as a mandatory safety standard.

Test procedures for critical radiant flux (§ 1209.6). The Commission has included the following changes in the proposed amendment concerning the test procecures for critical radiant flux:

(1) At § 1209.6(a) the Commission has added the words "or equivalent" after the words "an air-gas fueled radiant heat energy panel". This addition has been made since it may be possible for improved panels to be developed which will produce test results that are in agreement with the test results obtained using the specified panel. At the present time, however, the Commission is not aware that any other equivalent panel is available.

(2) At § 1209.6(b)(1) the Commission has replaced "Marinite XL" with "Marinite I" in order to correct an error in HH-I-515D.

(3) At § 1209.6(b)(2) the Commission has included a provision that would allow for alternative gas and air mixing systems. Since the standard provides that these gas and air mixing systems must be equivalent to the venturi-type system specified in HH-I-515D, the use of alternative systems would not affect test results.

(4) At § 1209.6(b)(2) the Commission has deleted the requirement that the test chamber shall be capable of operating at temperatures up to 816°C (1500°F). The Commission has deleted this phrase since the Commission does not believe that it is necessary to specify a maximum operating temperature for this apparatus.

(5) At § 1209.6(d) the Commission has deleted a section entitled "typical examples" under the heading "Test

Specimens" since the examples are not an essential part of the standard and do not clarify the test procedure. Also, in this section the Commission has added the requirement that three specimens per sample shall be tested since the Commission believes that three specimens are necessary and sufficient for statistical reliability.

(6) At § 1209.6(e) the Commission has added the statement "In a continuing program of tests, the flux profile shall be determined not less than once a week. Where the time interval between tests is greater than one week, the flux profile shall be determined at the start of the test series." The Commission has added this statement to ensure that the flux profile does not deviate from the standard during the production of the insulation.

(7) At § 1209.6(f) the Commission has deleted the requirement that specimens be conditioned "a minimum of 48 hours." The proposed amendment requires conditioning to equilibrium, with a less than 1 per cent change in net weight of the specimen in two consecutive weighings, with a minimum of two hours between each weighing. The Commission believes that these changes should ensure proper conditioning of the specimens.

(8) At § 1209.6(g)(2) and (3) the Commission has proposed that the amount of time the pilot burner flame must contact the test specimens be changed from "5 minutes" to "2 minutes". The Commission believes that if the specimen is going to ignite within the first 2 minutes. The Commission is not aware of any incidents in which specimens have ignited after an exposure of more than two minutes to the pilot light.

(9) Throughout § 1209.6, the Commission has also made numerous technical nonsubstantive changes such as numbering changes, correction of typographical errors, and the addition of tolerances, to ensure that the proposed amendment is suitable for issuance as a mandatory safety standard.

(10) The Commission has included figures *5a, 5b, 7a,* and *8a* in this proposal as alternative methods of constructing the specimen tray and the dummy specimen for the attic floor radiant panel test. These figures would replace figures 5, 7, 8 and 11, which are presently included in HH-I-515D. Unlike the present figures, the proposed figures provide the advantage of showing how to construct a specimen tray that is symmetrical and capable of being inserted in to the panel in either position. The figures also show modifications to the calcium silicate board to simplify the method of construction. The Commission does not believe that these figures would require extensive changes to existing attic floor radiant panel test equipment. At the present time the Commission believes that these alternate figures should be included in any final amendment. If the Commission decides to include these alternate figures in any final amendment, the Commission will make appropriate changes in section 1209.8(b) of the proposal, concerning construction and instrumentation of the radiant panel test chamber. Interested persons are asked to comment on the need for including these figures in any final amendment, and the possible impact of including these figures in any final amendment. The Commission will not include these figures in any final amendment if: (1) the commentors present information showing that there is no need for the proposed change, (2) the commentors show that the need for the change would be outweighed by the economic burden imposed by the changes because of decreased usefulness of the panel for other tests, or (3) the change will impact on the availability of existing attic floor radiant panel test equipment. (The Commission has not published figures 3 and 4 with the proposed amendment. These figures, which are photographs of the radiant panel, may be seen in the office of the Secretary of the Commission.)

Test procedures for smoldering combustion (§ 1209.7). The Commission has included the following changes in the proposed amendment concerning the test procedures for smoldering combustion:

(1) At § 1209.7(a)(1) the Commission has added the word "unfaced" to the glass fiberboard required as a pad in the test. The Commission believes that in order to obtain reproducible results in the test it is necessary to specify a standard substrate on which to place the specimen holder. The insulating medium used in the development of this test method and for the weight loss criterion chosen was unface glass fiberboard of the dimensions specified in the proposed amendment. The Commission believes that this change should increase the reproducibility of the test method.

(2) At § 1209.7(b)(1) the Commission has revised the procedure for loading the test specimen into the specimen holder as follows: "The material shall be blown, combed, or otherwise mixed to remove lumps and shall be loaded uniformly into each specimen holder, level and flush to the top of the holder". The purpose of this revision is to provide some assurance that the specimen will be consistent and be distributed uniformly in the specimen holder. The change should eliminate possible variations in test results that may occur if the material is not distributed uniformly in the specimen holder.

(3) At § 1209.7(b)(1) the Commission has added the phrase "whichever period is longer" in order to clarify the duration of the test.

(4) At § 1209.7(b)(2) the Commission has clarified the procedure for determining the net weight of the content of the specimen holder at the conclusion of the test.

(5) At § 1209.7(b)(2) the Commission has changed the provision for allowing the specimen holder to cool down from "25°C" to "approximately room temperature". The Commission believes that this change is consistent with the requirement that the test area be maintained at 21 ± 3°C, and should not affect test results. The change will make it easier to conduct the test.

(6) At § 1209.7(b)(3) the phrase "Three specimens per sample shall be tested" has ben added to the proposed amendment. The Commission has chosen three specimens to be consistent with the critical radiant flux determination. For the critical radiant flux determination, the Commission believes that three specimens ar necessary and sufficient for statistical reliability. This change is intended to eliminate confusion as to the number of specimens per sample to be tested.

(7) Throughout § 1209.7 the Commission has also made technical nonsubstantive changes, such as numbering changes, correction of typographical errors, and the addition of tolerances, to ensure that the proposed amendment is suitable for issuance as a mandatory safety standard.

IV. Response to Comments Received Concerning the Notice of Intent

In the Federal Register of September 6, 1978, the Commission published a notice of intent to propose an amendment to the interim standard (43 FR 39720). The notice of intent included the relevant provisions of GSA Specification HH-I-515D, along with several changes suggested by the Commission's staff, and requested public comments on all aspects of the proposed amendment and related issues. The Commission received twenty-two timely comments and eight late comments in response to the notice of intent. These comments are available for inspection in the Office of the Secretary of the Commission. An explanation of the relevant issues raised by the comments, along with the Commission's response, is given below:

Settled density. GSA Specification HH-I-515D contains test requirements and procedures for determining settled density. In the proposed amendment, at Section 1209.4, the Commission has included a new test procedure for determining settled density—the cyclone-shaker test method. An explanation of the new method for determin-

ing settled density and the reasons for the change are stated in the section of this FEDERAL REGISTER notice titled, *III. Commission Proposed Changes to the Flame Resistance and Corrosiveness Provisions of HH-I-515D.* In response to the notice of intent the Commission received the following comments concerning settled density:

Several commentors criticized the settled density test method in HH-I-515D as being cumbersome, complex, expensive and time consuming. According to these commentors, the test method can be run by only a few laboratories. The commentors claimed that a large conditioning area is required and that the blowing operation and drop box procedures in HH-I-515D are too dusty and messy for laboratory environments. Other commentors stated that no substantiating test data have been offered in support of the test method in HH-I—515D.

However, one commentor urged the Commission to retain the settled density test method in HH-I-515D, claiming that it is necessary to control variables such as moisture content, temperature, and the mechanical environment surrounding the test specimen. The commentor also claimed that the cyclone-shaker substitute method for determining settled density is without supportive data and does not correlate to real world conditions, since it is impractical to attempt to simulate 10 or 20 years of natural conditions in less that the 28 day period required in the HH-I-515D test method.

The procedure in HH-I-515D was designed to predict the condition of the cellulose insulation after it has been installed for one or two years. Properties such as R-value (not part of the proposed amendment) and smolder resistance (part of the proposed amendment) are affected by density. The Commission agrees with the commentors who stated that the present settled density test in HH-I515D is cumbersome and time consuming. To overcome these problems, the Commission has included in the proposal the cyclone-shaker test method, a substitute test method for determining settled density. This test method was recommended to the Commission by the Department of Energy as a substitute test method for the method of determining settled density in HH-I-515D. (In a comment on the Notice of Intent, the Department of Energy recommended that the Commission adopt the cyclone-shaker test method.)

As discussed earlier, in the section of the FEDERAL REGISTER notice concerning Commission proposed changes to the flame resistance and corrosiveness provisions of HH-I-515D, the Commission staff and the Department of Energy have conducted tests indicating that test results for the present test method of HH-I-515D and the cyclone-shaker test method are substantially the same. The Commission believes that these tests show that the cyclone-shaker test method simulates real life conditions at least as accurately as the test method of HH-I-515D. As a result, the Commission believes that these tests provide supportive data for the cyclone-shaker test method.

Another commentor questioned the possible change to the dry, shaker method for determining settled density. The commentor stated that while the shaker method may be easier to conduct, the results from this test provide better coverage and obscure the possibility of more settlement after installation. The commentor recommended that if the cyclone-shaker method is adopted, the product should be preconditioned before using the shaker. However, another commentor questioned the need for humidity conditioning in the settled density test.

The Commission believes that the cyclone-shaker method simulates settling after installation as well as the HH-I-515D settled density test. The Commission agress that preconditioning should be performed before the test is run and has required preconditioning in the proposed amendment. The Commission has included humidity conditioning in the proposed amendment in order to eliminate variability in test results that arise from not using the same preconditioning.

Several commentors raised issues concerning relative humidity conditioning and the description of the procedures for sample preparation and box sizes in the settled density test of HH-I-515D. Since the cyclone-shaker test in the proposal does not involve these issues the issues have been resolved with the substitution of a different test method in the proposed amendment.

One commentor stated that the "blowing" technique used in the present interim standard based on HH-I-515C was intended to simulate the actual field installation environment and does so more accurately than the settled density test methods which are used in HH-I-515D and in the proposed amendment.

The Commission believes that in test which are affected by density, such as the smoldering combustion test, it is important that the insulation be tested at the worst case density. For cellulose insulation the worst case density for smoldering combustion is the settled density, which is measured by the test method in the proposed amendment. The blown density test method in the present interim standard based on HH-I-515C does not measure settling after installation. As a result, the Commission believes that the blown denisty test method is not appropriate for measuring the density to be used in the smoldering combustion and corrosiveness tests.

One commentor questioned the reliability of the settled density test mehtod and questioned the appropriateness of the test, claiming that it is a compaction test rather than a settled density test.

The Commission has no data to indicate that the cyclone-shaker test method recommended by the Department of Energy is not reliable. The Commission does have data to show that the cyclone-shaker test method gives approximately the same results as does the method in HH-I-515D. The National Research Council of Canada has conducted tests which indicate that compaction procedures produce settled densities found in homes. Therefore, the Commission has retained compaction procedures in the settled density test method.

Several commentors suggested that the Commission consider alternate methods for determining settled density that are less lengthy and less expensive. One commentor recommended that an alternate test, the Thermtron settled density test, be considered.

The Commission believes that the cyclone-shaker test method included in the proposed amendment will provide approximately the same benefits in economy, quickness, and ease of use as those of the Thermtron method.

Requirements and test procedures for corrosiveness. The proposed amendment to the interim standard, at sections 1209.3(a) and 1209.5, includes requirements and test procedures for corrosiveness. In response to the Notice of Intent, the Commission received the following comments concerning these requirements and procedures:

One commentor, a manufacturer of wood fiber insulation, claimed that there were no known incidents where metallic corrosion was associated with wood fiber insulation.

The Commission has no knowledge of incidents of corrosion associated with wood fiber insulation. However, the Commission is aware of several confirmed incidents where metallic corrosion was associated with other forms of cellulose insulation. These incidents were among the exhibits brought forth during the Home Insulation Hearings before the Subcommittee on Oversight and Investigations (of the House Committee on Interstate and Foreign Commerce) on February 22, 1978. At the hearings, among the incidents reported were a roof collapse of a cheese warehouse in Wisconsin and corrosion of piping and wiring of condominium units in California. The Commission does not be-

lieve that it is sufficient evidence to treat wood fiber insulation differently from other cellulose insulation.

Several commentors criticized the proposed corrosion test, stating that insufficient work has been done to determine whether the corrosion test will adequately address the corrosive nature of some fire retardants. Several commentors stated that the corrosiveness test of HH-I-515D was unreasonably severe. According to one commentor, laboratory tests have shown that untreated whole wood fibers that are not waste products or newsprint materials will fail the corrosion test. The commentor claimed that the corrosion test is not realistic, stating as an example the use of excessive moisture in saturating the system.

Based on the Commission staff experience with the corrosiveness tests of the present interim standard and the corrosiveness test of HH-I-515D, the Commission believes that the corrosion test in the proposed amendment does differentiate the corrosive nature of various cellulose insulation.

The Commission does not believe that the corrosion test procedure, as proposed, is unreasonably severe since many cellulose insulation products currently available can meet the corrosiveness requirement. The Commission has no data concerning the likelihood that untreated whole wood fibers will fail the corrosiveness test. However, since many cellulose insulation products can meet these requirements, the Commission does not believe that the corrosiveness requirements are unreasonably severe.

The Commission believes that in order to have an acceptable test period time for the corrosion test, accelerated conditions must be established. Often severe conditions which a material may encounter are used in accelerated durability testing, such as saturating the cellulose insulation. Otherwise, unacceptably long testing periods may be necessary.

One commentor recommended that the Commission adopt the corrosiveness test used for mineral wool, GSA Specification HH-I-1030B, since it more closely resembles the situation in a home. Another commentor recommended that the Commission use the corrosion test method in GSA specification HH-I-558B, a specification for industrial mineral fiber insulation.

The Commission believes that further work would be needed to assess whether these tests are more representative of a home situation for cellulose insulation. At the present time, there is insufficient data to assess the predictive and discriminatory capacities of mineral wool corrosion tests when applied to cellulose insulation.

Several commentors criticized the reproducibility of the corrosiveness test.

Based on both a critique of cellulose insulation corrosiveness tests conducted by NBS and on Commission staff experience with the corrosiveness test procedure, the Commission believes that the proposed changes in the corrosiveness test procedure will reduce potential testing variables, thus making the test more reproducible. In the next several months, the National Bureau of Standards (NBS) will be conducting an interlaboratory study on the corrosiveness test procedure. At the present time, the Commission has no information to indicate that the proposed corrosiveness test is not reproducible.

Several commentors suggested that the procedure section of the corrosiveness test requires clarification to monitor or control loss of water, which may have an adverse effect on the ability of the specimen to pass the test. Several commentors suggested that the test be conducted in a closed container to eliminate water evaporation. Other commentors suggested that the provision in the corrosiveness test of HH-I-515D for a drip guard to divert condensation to the chamber floor may cause unusual air currents that could artifically dry the test specimens. The commentors suggested that unless water loss is monitored, the drip guard provisions should be eliminated or qualified.

The Commission believes that the commentors have not presented adequate data showing that the test procedure should include provisions to monitor or control water weight loss from the water-saturated insulation test specimens. The Commission has no evidence to indicate that large variability in water weight loss is caused by variability within the humidity chamber used in the test procedure rather than in differences between the test specimens themselves. Also, the Commission believes that there is insufficient data existing to support additional measures suggested by the commentors to control water loss, such as the use of a closed container, or the elimination or qualification of the drip guard provision.

Several commentors suggested that the provisions for sample preparation required clarification to avoid the probability of evaporation from the mixture of insulation and water, and to avoid the problem of air pockets occurring when the insulation material is not in direct contact with the metal coupon.

At § 1209.5(b) of the proposed amendment the Commission has included provisions to address these concerns. The proposed procedure provides that care should be taken to avoid evaporation from the composite specimen. In addition, tamping of the composite specimen should result in reducing the occurrence of air pockets.

Several commentors suggested that the methods for cleaning the test coupons be changed. One commentor suggested using the cleaning method in GSA Specification HH-I-1030B, used for mineral wool. However, one commentor stated that there was no significant difference in results directly attributable to coupon cleaning techniques. Another commentor disagreed with the staff suggestion that additional procedures are needed to effectively clean the test coupons. According to the commentor, current cleaning procedures are excessive. Several commentors suggested that the current post-cleaning method of HH-I-515D using nitric acid has a significant effect on the steel coupon, leading to an inaccurate evaluation of the corrosiveness of the test specimen.

Since corrosion is a phenomenon associated with the material and its environment, the Commission believes that metal surface cleanliness is an essential part of this corrosion testing to reduce variability and that the proposed cleaning method should be sufficiently rigorous to eliminate variability in test results that may result when the metal surface of the test coupon is not clean. The proposed cleaning method for the steel coupons is similar to that HH-I-1030B since caustic is used. As a result of changes in the cleaning method as published in the proposed amendment, the Commission believes that the proposed cleaning method is a substantial improvement over the test method specified in HH-I-515D, since the test method in the proposed amendment will effectively remove known rust inhibitors and contaminants from the surface of the test coupons.

The Commission has deleted reference to nitric acid as a post-cleaning agent because of the possibility that the use of nitric acid may significantly decrease the amount of intact metal remaining on the metal coupons. Therefore, at § 1209.5(b)(6) the staff has incorporated in its place practices which remove corrosion products while greatly reducing removal of the intact metal of the particular test coupon. These practices are those contained in "ASTM-G1, Standard Recommended Practice for Preparing, Cleaning, and Evaluating Corrosion Test Specimens", published by the American Society for Testing and Materials, 1916 Race Street, Philadelphia, Pa. 19103.

Several commentors suggested using crystallizing dishes instead of evaporating dishes, since the test coupons fit more easily into the crystallizing dishes.

The Commission has made the changes so that the type of dish is consistent with current laboratory practices and with the present interim standard. The change will also allow the test coupons to be more easily centered in the insulation specimens.

One commentor requested that the temperature and humidity conditions of the corrosiveness test not be changed from those specified in HH-I-515D.

In the proposed amendment the Commission has not changed the temperature and humidity conditions of the humidity chamber in the corrosion test as described § 1209.5(b)(5). These conditions are 48.9 ± 1.7°C (120 ± 3°F) and 97 ± 1.5 percent relative humidity.

Several commentors suggested that a parenthesis be added to clarify that the specimens rather than the humidity chamber are to be conditioned for fourteen days.

At § 1209.5(b)(5) the Commission has incorporated wording to clarify that the test specimens remain in the humidity chamber for 14 days and that the chamber be preconditioned to 48.9 ± 1.7°C (120° ± 3°F) and 97 ± 1.5 percent relative humidity.

One commentor questioned the availability of test coupons without a rust inhibitor.

Since the availability of test coupons without a rust inhibitor is uncertain, the Commission has proposed specific cleaning steps for each type of metal. The Commission believes that the cleaning procedure in the proposed amendment at § 1209.5(b), will effectively remove known rust inhibitors from the test coupons. The Commission is considering the possibility of recommending that metal coupons for cellulose insulation corrosion testing be included in the NBS Collaborative Reference Materials Program, in order to make standard metal coupons available.

One commentor stated that trichloroethane is difficult to obtain.

Based on communications with several commercial laboratories, the Commission has no evidence to indicate that 1,1,1-trichloroethane is difficult to obtain.

One commentor stated that use of a chrome reflected 40W light bulb is not necessary since pitting and etching can be observed in ordinary light.

The Commission agrees with the commentor. In § 1209.5(b)(7) and (c) of the proposed amendment the Commission has specified that a 40-W appliance light bulb is sufficient. Therefore, a chrome reflector is not necessary.

The Department of Energy recommended that the Commission incorporate specified changes in the test procedure for corrosiveness. The recommendations were based upon technical studies conducted for the Department of Energy.

The Commission has incorporated several changes in the proposal to address the Department of Energy comments on corrosion. The most significant changes have been made in the sections of the procedure addressing the cleaning of metal coupons at § 1209.5(b).

One commenter supported the proposed revision for the 14 day exposure test, claiming that this test method would remove much of the subjectivity of the present test procedure in the interim standard based on HH-I-515C and would produce more repeatable results. The Commission agrees.

One commenter suggested that an evaluation of corrosiveness be based on the rate of corrosion, rather than visual detection. The same commenter suggested an alternate method for evaluating corrosiveness based on an analytical measurement of the amount of corrosion.

The Commission does not have evidence to indicate that the method for evaluating corrosiveness suggested by the commenter is a more representative, repeatable, reproducible, or more satisfactory method for evaluating corrosiveness than the criterion in the proposed amendment. As a result, the Commission has not included in the proposed amendment a method for evaluating corrosiveness based on a rate of corrosion.

One commenter claimed that the procedure in the proposed corrosiveness tests could be improved with the addition of control specimens.

The Commission believes that the use of control coupons would introduce subjectivity into the test method and therefore believes they should not be included.

Requirements and test procedures for critical radiant flux. The proposed amendment, at § 1209.6, includes test procedures for critical radiant flux based on the test procedures at paragraph 4.8.7. of HH-I-515D. Section 1209.3(b) of the proposed amendment requires cellulose insulation to have a critical radiant flux equal to or greater than 0.12 w/cm^2/ for each of the three specimens when tested in accordance with the test procedures. In response to the notice of intent, the Commission has received the following comments on the requirements and test procedures for critical radiant flux:

Several commenters supported the elimination of the Steiner tunnel and flame resistance permanency tests of HH-I-515C. One commenter stated that the attic floor radiant panel test in HH-I-515D was a more precise test than the Steiner tunnel test, since it gives results that are mathematically accurate rather than simply a comparison of flame propagation characteristics with other materials.

Another commenter criticized the Steiner tunnel test method of the present interim standard as having many problems and giving questionable results. The commenter supported the attic floor radiant panel test method since it eliminates the use of the wire screen and tests the insulation in an orientation that represents an actual installation.

Several commenters objected to the inclusion of the attic floor radiant panel test method.

One commentor claimed that the Steiner tunnel test method in the present interim standard should not be replaced with the attic floor radiant panel test method in the proposed amendment, since the attic floor radiant panel test method is an obscure fire test method that has not been recognized by any national consensus standards organization.

Based on the information provided to the Commission by NBS, the Commission does not agree since the test method is essentially the same as that used to rate floor covering materials under National Fire Protection Association (NFPA) Standard 253 and American Society for Testing and Materials (ASTM) E 648. The only major change in the test method is the replacement of the floor covering specimen with a 5 cm. deep specimen of cellulose insulation.

Several commentors also claimed that the ruggedness and reproducibility of the attic floor radiant panel test method have not been demonstrated.

The Commission sponsored a NBS round robin program for determining the ruggedness and reproducibility of the attic floor radiant panel test. Based on a review of the results obtained in this test, the Commission believes these tests to be reasonably reproducible. The Commission has no evidence to indicate that the test procedure is not a rugged one, in the sense that test results would differ in repeated tests conducted using the same apparatus.

Several commenters questioned the adequacy of the attic floor radiant panel test method because they believe there is a lack of comparison testing to determine reproducibility. According to several commenters, although the attic floor radiant panel test procedure is repeatable within a laboratory when the same sample is tested several times, a significant variance can be expected from laboratory to laboratory. The commenters referred to a round robin test involving four laboratories that resulted in as much as a 35 percent difference in the critical radiant flux value. The commenters also stated that recent tests by the NBS resulted in substantial dif-

ferences among laboratories. According to one commenter, when identical samples of the product were sent to testing laboratories, the insulation passed in one laboratory yet failed in another.

In a round robin test on seven cellulose insulation materials involving nine different laboratories, the average coefficient of variation for reproducibility of the critical radiant flux measurement was 21% (from a range of 13% to 30% for the seven materials tested). NBS reports that this value of 21% is comparable to variations found in tunnel test data on materials other than cellulose insulation and indicates that the attic floor radiant panel test is a comparably reproducible test. Comparative test data for cellulose insulation tested in the Steiner Tunnel is not available.

Other commentors questioned the NBS determination that the Steiner tunnel is not a good indicator of flame resistance of cellulose insulation.

Based on an analysis of the adequacy of the Steiner tunnel by NBS, the Commission believes that the Steiner tunnel test is not a good indicator of flame resistance associated with cellulose insulation. The Commission has no data that proves that the Steiner tunnel is a good indicator of the flame resistance of cellulose insulation.

According to several commentors, data have not been presented that would show that the attic floor radiant panel test method has a greater correlation with full scale attic insulation tests than the Steiner tunnel. One commentor stated that flammability studies conducted for failing insulation specimens showed a lack of discernment (or ability to measure the degree of failure) by the radiant panel test in comparison to the level of discernment in the Steiner tunnel test.

The Commission also does not have data indicating that either the attic floor radiant panel or Steiner tunnel test methods correlate with full scale attic tests. The Commission also does not have data that precisely demonstrates the level of discernment between the two test methods. However, NBS has reviewed unpublished tests at Underwriters Laboratories, Inc., in which eight different brands of cellulose insulation were tested. Each brand of cellulose insulation that passed the attic floor radiant panel test with critical radiant flux values in the range of 0.12 to 0.34 W/cm² also passed the Steiner tunnel test with ratings of 25 or under. In those Underwriters Laboratories, Inc., tests in which cellulose insulation in a warm (71° C air temperature) attic was exposed to a small flame, NBS reports that materials with a critical radiant flux of 0.12 W/cm² or above (representing a passing test result) allowed a flame to spread only a few inches from the ignition source. Cellulose insulation that failed the attic floor radiant panel test with critical radiant flux values of less than 0.12 W/cm² also failed the Steiner tunnel test with ratings from 35 to 120. These tests do not indicate that the Steiner tunnel test was more selective than the attic floor radiant panel. The only gradation of test ratings for materials in the Steiner tunnel test occurred with materials that failed. The cellulose insulation that failed the Steiner tunnel test also failed the attic floor radiant panel test, and would have propagated flames at unacceptably low levels of radiant flux.

One commentor stated that while the attic floor radiant panel test is intended to represent later stage, fully developed fire conditions in buildings, the attic floor radiant panel test conditions have not been shown to be suitable for characterizing incipient and developing stages of building fires associated with insulation.

According to NBS, the attic floor radiant panel test is designed to measure the externally applied heat flux which will result in flame propagation. The range of this heat flux was originally chosen for the flooring radiant panel test to simulate the wide range of values that would be obtained at floor level in a corridor when a well developed fire exists in an adjoining room. According to studies conducted by NBS, the heat flux in a corridor with an adjoining room fire is similar to the heat flux presented in an attic where the attic temperature is high because of heat from the combined effects of the sun and a small attic fire. As a result, to evaluate cellulose insulation when the attic temperature is high, NBS chose to use the same external heat flux range that is used for evaluating floor coverings.

One commentor questioned whether a test method that used a small sample could representatively evaluate insulation materials to be installed over much greater areas. The commentor questioned whether the small sample of the attic floor radiant panel test can representatively evaluate materials where chemical distribution and displacement variations exist.

Based on an analysis of the attic floor radiant panel test method by NBS, the Commission believes that the sample size is a reasonable one to evaluate the expected performance of the insulation material, since the attic floor radiant panel simulates the physical arrangement and exposure conditions in an attic. NBS has informed the Commission that in unpublished tests at Underwriters Laboratories Inc., the behavior of cellulose insulation material in the attic floor radiant panel test was shown to correlate with fire performance of the insulation in large scale simulated attic tests.

Several commentors questioned the requirement of paragraph 3.1.9 of HH-I-515D that each of the specimens tested have a critical radiant flux equal to or greater than 0.12W/cm². One commentor suggested that the requirement be changed to require two of three specimens to have a critical radiant flux equal to or greater than 0.12W/cm².

Based on the test method developed by NBS for the attic floor radiant panel, the Commission believes that each of the three specimens tested must meet the requirement. Based on an analysis of the radiant panel test method, the Commission believes that even one failure presents a marginal condition.

One commentor claimed that the attic floor radiant panel was unable to evaluate the growth or build-up of a fire. The commentor stated that the fire hazard should be based on performance after ignition.

According to NBS, the attic floor radiant panel test is intended to determine if, under simulated fire conditions, a material will allow flame to propagate across its surface. If the effective radiant flux in an attic situation exceeds the critical radiant flux, flames will propagate over the entire surface. Thus, the Commission believes that the attic floor radiant panel test method is able to determine the conditions under which the insulation material will contribute to the growth of the fire.

One commentor stated that the rate of flame spread is a critical factor, measured by the Steiner tunnel test method but not by the attic floor radiant panel. Another commentor suggested that the time of flame front travel between designated distances be recorded during attic floor radiant panel tests.

It is true that the attic floor radiant panel test does not measure flame spread rate, which is measured by the Steiner tunnel. The attic floor radiant panel test is intended to determine if, under simulated fire conditions, a material will allow a flame to propagate across its surface regardless of the rate of flame spread. Based on NBS's analysis of fire hazards associated with cellulose insulation, the Commission believes that it is less important to determine the rate of flame spread of cellulose insulation than the likelihood that flames will propagate across the cellulose insulation.

One commentor also criticized the attic floor radiant panel test method since it has no provision for smoke measurement.

The Commission is unaware of any test method which measures the relative hazard presented by smoke gener-

ated by burning cellulose insulation. The interim standard currently in effect based on HH-I-515C does not contain any provision for smoke measurement.

One commentor stated that additional work needs to be done to determine the effects on test results of positioning the pilot burner and placement of test specimens.

The Commission does not have sufficient data to indicate that the positioning of the pilot burner or the positioning of the test specimens is not adequately controlled. As indicated earlier, the NBS round robin tests on the attic floor radiant panel indicated that the coefficient of variation for the radiant panel was 21%, which NBS reports is comparable to other flammability tests.

Several commentors questioned the need for a Commission staff suggested change in the method for preparing specimens for pneumatic applications. The change would allow the blowing hose to be pointed "approximately" 10 degrees upwards. According to one commentor, variations from the 10 degree procedure can produce substantially different results. However, another commentor agreed with the change.

The Commission believes it is reasonable to require a fixed blowing angle for standardization purposes in the attic floor radiant panel test and agrees with the suggestion that a fixed jig be used. In the proposed amendment at § 1209.6(d)(1), the Commission has substitued a tolerance of ±1 degree from the specified angle. The Commission does not believe that the addition of this tolerance will produce significant differences in the results of the test.

Several commentors agreed with the change suggested by the Commission staff that specimens be conditioned until equilibrium is reached whether it takes less or more than forty eight hours. One commentor suggested that the standard include a method for determining whether the test specimen has reached equilibrium.

The Commission has included a definition of equilibrium at § 1209.6(f) of the proposed amendment. The time for a specimen of insulation to come to moisture equilibrium varies with the density of the material, the amount of exposed surface area, and the relative humidity level. Therefore, the Commission agrees with the commentor that the specimen should reach equilibrium within the conditioning environment even if it takes over 48 hours. As a result, § 1209.6(f) as proposed does not contain a 48 hour limit on the amount of time for conditioning test specimens.

One commentor agreed with the staff suggested change that the attic floor radiant panel be located in a draft protected "area" rather than a "laboratory," since only the area where the specimen is tested, rather than the entire laboratory, needs to be draft protected. The Commission has included this suggested change in the proposed amendment at § 1209.6(b)(1).

One commentor disagreed with the change suggested by the Commission staff that the amount of time for leaving the pilot burner flame in contact with the test specimen be reduced from five minutes to two minutes. The commentor, an independent testing laboratory, stated that additional experience was necessary to support the change. Another commentor opposed the change, and claimed that specimens failed after an exposure of more than two minutes with the pilot burner flame. However, other commentors agreed with the change.

Based on its experience with tests conducted using the attic floor radiant panel, the Commission believes that this change will allow the tests to be conducted more quickly without affecting the test results. The Commission has not experienced any incidents in which there has been a delayed ignition beyond two minutes but before five minutes. The Commission has incorporated this change in the proposed amendment, at § 1209.6(g)(3).

Several commentors stated that modifications should be made in the procedure so that specimens are tested at settled density.

Preliminary testing by NBS has indicated that the density of the test specimens does affect the attic floor radiant panel test results. NBS reports that the blown density test method specified in the test procedure at § 1209.6(d) represents "worst case" conditions. The Commission believes that the attic floor radiant panel test should be conducted at the blown density, which according to work conducted by NBS, is the worst case density for this test.

Several commentors questioned the need to apply a 50% safety factor based on an attic exposure of 160°F. The requirement at § 1209.3(b) that the critical radiant flux measurement be greater than or equal to 0.12 W/cm^2 was obtained by adding this factor.

NBS reports that attic temperatures of 71°C (160°F) may occur in certain locations of the United States. The radiation to the attic floor from the roof at a temperature of 71°C (160°F) would be 0.08 W/cm^2. Considering the state of the art in fire performance testing, a 50% factor of safety is appropriate, according to NBS fire experts. Based on information presently available, the Commission believes that the critical radiant flux requirement at § 1209.3(b) of the proposed amendment is appropriate.

One commentor objected to the staff suggestion that the attic floor radiant panel heat source be capable of operating at temperatures up to 750°C rather than 816°C. The commentor stated that the only known suitable panel is capable of operating up to 816°C. However, another commentor agreed with the staff suggestion.

The Commission believes that the operating temperature specification at paragraph 4.8.7 of HH-I-515D serves no purpose in the test procedure. As a result the Commission has not included an operating temperature specification in the proposed amendment. The deletion of this requirement will not affect the ability of existing equipment to adequately perform the test.

One commentor stated that the density and thermal conductivity specification for Marinite XL, a calcium silicate board used to construct the attic floor radiant panel test apparatus, is incorrect in HH-I-515D. The Commission agrees with the commentor and has made changes at section 1209.6(b)(1) of the standard. The inclusion of Marinite XL in HH-I-515D represents an error.

One commentor proposed an alternate system for mixing gas and air that would still maintain critical panel and chamber temperatures. At section 1209.6(b)(2) the Commission has included a provision that would permit the use of alternate panels and alternative gas/air mixing systems that give equivalent test results.

The same commentor also pointed out several dimensional errors in figures 4, 5, and 6, as published in the notice of intent. The Commission has reviewed these figures and made appropriate changes.

One commentor agreed with the staff suggested correction of a typographical error at § 1209.6(b)(8) in the description of the range of the total heat flux transducer used in the test chamber.

One commenter claimed that the attic floor radiant panel test method, at section 4.8.7 of HH-I-515D, is wasteful in that it consumes large quantities of methane. The commentor also stated that the test method could present a danger of accidental explosion.

The Commission has no information supporting the conclusion that the attic floor radiant panel test method in the proposed amendment would have any appreciable effect on the supply of methane gas. The proposed amendment, at § 1209.6(c), includes safety procedures to guard against the possibility of a gas-air fuel explosion in the test chamber. The Commission has no evidence to indicate that these safety procedures are not adequate.

Requirements and test procedures for smoldering combustion. The pro-

posed amendment, at §§ 1209.3(c) and 1209.7 includes requirements and test procedures for smoldering combustion. In response to the notice of intent, the Commission received the following comments concerning these requirements and procedures:

One commentor stated that the present interim standard based on HH-I-515C does not adequately protect the consumer from the unreasonable risk of injury associated with cellulose insulation since the present standard lacks of provision to address hazards associated with smoldering ignition. The commentor stated that test methods in the proposed amendment, including the smoldering combustion test, more accurately parallel actual use conditions and are likely to better protect the consumer from the unreasonable risk of injury from fires associated with cellulose insulation.

The Commission agrees with the commentor that the smoldering combustion test is needed. The Commission recognizes that smodering is a major potential fire hazard associated with cellulose insulation. According to NBS, the cigarette smoldering combustion test was developed to ensure that cellulose insulation material has some resistance to smoldering.

Another commentor stated that the smoldering combustion test is a fair procedure that is repeatable. The commenter also stated that the smoldering combustion test measures and assesses an important aspect of the total fire hazard of cellulose insulation. Several other commentors also supported the inclusion of the smoldering combustion test method.

In spite of some reservations about the correlation of the test method to real-life situations, another commentor supported inclusion of the smoldering combustion test method in the proposed amendment since the test method provides identification of materials with a significantly greater potential for smoldering. The commentor stated that smoldering is the major potential fire hazard associated with cellulose insulation.

Several commentors stated that while the need for a smoldering combustion test has apparently been established, no significant effort has been made to substantiate the use of the cigarette ignition exposure to produce the smoldering combustion. One commentor objected to using the cigarette as an ignition source, since lighting a cigarette is distasteful for a nonsmoker.

The cigarette was chosen as an ignition source because of its smoldering capabilities. Corollary work on smoldering temperatures has been done by NBS to demonstrate that the cigarette is a reasonably reproducible ignition source. If there are personal reasons a tester would choose not to light a cigarette the tester may use equipment, such as a vacuum pump, to accomplish the desired end result.

One commentor questioned the reliability of the smoldering combustion test method as a result of many uncontrolled variables that can enter into the testing procedure.

The Commission has made an effort to control and specify all important parameters in the smoldering combustion test. A round robin evaluation of the smoldering combustion test involving 10 laboratories and seven cellulose insulation materials, indicated good agreement among the laboratories in measuring the extent of smoldering. The pass/fail results for 3 of the 7 materials had full agreement in all 10 laboratories. The results of three other materials agreed in 9 of 10 laboratories. The results of the remaining material agreed in 7 of the 10 laboratories.

Several commentors stated that the test method does not specify how many tests must be run on each specimen. The commentors suggested that three tests be run. Open flamming during any one or more of the tests would be a failure, or a weight loss of 15% or more on one test would be a failure. One commentor, the Department of Energy, recommended that the number of samples tested in the smoldering combustion test be increased to five in order to increase the statistical knowledge of the material being tested.

The Commission recognizes that there are differing opinions as to the number of specimens that should be tested in the smoldering combustion test. The Commission has followed the HH-I-515D requirement that three specimens of insulation be tested in the attic floor radiant panel test. Insufficient test data are available to support the change at this time. Based on its experience with the attic floor radiant panel test, the Commission believes that three specimens are an adequate and appropriate number to be tested.

Several commentors stated that the smoldering combustion test method is sensitive to density. According to the commentors, in order to produce accurate results each product must be tested at its own settled density. The commentors criticized round robin tests conducted by NBS, claiming that these tests were run at an arbitrarily chosen density for each product. The commentors suggested a procedure for obtaining the proper density in the specimen holder. One commentor stated that additional steps might be required beyond determining the settled density to ensure accurate results.

At section 1209.7(b)(1) the proposed amendment provides that specimens are tested at their settled density and includes procedures for obtaining that density in the specimen holder. The round robin tests conducted by the National Bureau of Standards were performed at a fixed density of 48 Kg/m^3 (3.0 lb/ft^3). This fixed density was adopted because the sensitivity of test results to density was well known. The round robin was intended to measure the variability of the test method aside from variations caused by changes in material density. The Commission does not have sufficient evidence to indicate that additional steps beyond determining the settled density are necessary to ensure accurate results.

Several commentors objected to the inclusion of the staff suggestion that "equivalent" fiberboard be permitted, unless the amendment states what is to be equivalent. However, one commentor agreed with the change.

The Commission agrees with the commentors that more detailed specifications for the fiberboard substrate are needed. Accordingly these specifications have been included in § 1209.7(a)(1) of the proposed amendment.

Several commentors stated that the conditioning requirements were necessary and recommended that they be the same as those for the attic floor radiant panel test. The commentors suggested that the specimen be conditioned at 69°F and 50 per cent relative humidity until equilibrium is reached. Another commentor disagreed, stating that test results did not show detectable differences with conditioned and unconditioned material.

After further study the Commission has included clarifications of the conditioning requirements in the proposed amendment. Section 1209.7(b)(1) now requires the specimens and cigarettes to be conditioned until equilibrium is reached. As proposed, the amendment calls for the same conditioning requirements for both the attic floor radiant panel and the smoldering combustion test procedures.

One commentor stated that while it is important to condition the specimens before testing them, there is no demonstrated need to test the specimens under the same environmental conditions. The commentor recommended that the materials be conditioned for at least 72 hours, removed, and then immediately tested under normal laboratory conditions.

The National Bureau of Standards has demonstrated significant variations in smoldering combustion test results in tests performed at several different laboratory temperature and humidity conditions. The specified test space conditions at § 1209.7(a)(4)

of the proposed amendment will help to ensure more uniform testing.

Other Comments. The Commission received other comments addressing various issues related to the amendment to the interim standard.

Several comments identified installation of cellulose insulation over recessed light fixtures as being a major problem. One commentor suggested that the Commission include a test procedure of simulate smoldering or ignition over recessed light fixtures. Another commentor claimed that the flame resistance tests in the proposed amendment may not be adequate to address problems related to installation of cellulose insulation around recessed electrical light fixtures. The commentor stated that the proposed amendment should require manufacturers to provide explicit installation instructions.

The Commission is aware that the flame resistance tests in the proposed amendment may not fully address problems associated with the improper installation of cellulose insulation. At the present time the Commission is unaware of any flame resistance test which has been shown to be adequate or has gained widespread recognition or approval for simulating exposure to recessed electrical light fixtures. The Commission has no information that would indicate that the test method suggested by the commentor is an appropriate one that should be included in the proposed amendment. The Commission has proposed a labeling rule that is intended to address problems associated with the improper installation of cellulose insulation (43 FR 59390, December 20, 1978), including improper installation around or over the top of recessed electrical light fixtures.

One commentor stated that an adequate test for assessing flame resistance permanency should be developed. At the present time, the Commission is not aware of any test which effectively assesses flame resistance permanency. An NBS analysis of the flame resistance permanency test in the present interim standard indicates that this test is not an appropriate measure of flame resistance permanency, since the test method, which is based on the test method in HH-I-515C, has not been shown to correlate with real life conditions. HH-I-515D does not include a test method for assessing flame resistance permanency.

Several commentors suggested that the Commission include labeling requirements to enable consumers to distinguish insulation that meets the requirements of the amended interim standard. One commentor also suggested that the labeling requirement include a scale reflecting flammability and corrosion characteristics.

At § 1209.9, the Commission has included a labeling requirement in the proposed standard that would enable consumers to identify insulation that complies with the amended interim standard. The proposed amendment provides minimum requirements for flame resistance and corrosiveness characteristics of insulation. Although manufacturers may, of course, exceed the requirements, the Commission does not believe that it is necessary to include a requirement that flammability and corrosion characteristics be reflected on a scale.

Several commentors agreed with the Commission staff suggestion to delete the requirement of HH-I-515D that insulation containers be marked with a coverage chart for obtaining R values. (The coverage chart referred to in this section is used to indicate the number of pounds of insulation per square foot of floor space to obtain a given R value.) However, other commentors stated that leaving the coverage chart requirement in would help reduce confusion.

The proposed amendment has no requirements for coverage or thermal efficiency (R-value) since these requirements are not part of the flame resistance or corrosiveness provisions of HH-I-515D. As a result, the Commission has not included the R-value coverage chart as a requirement in the proposed amendment. However, the Commission decision not to include the coverage chart in the proposed amendment would not prevent manufacturers from putting a coverage chart on their bags of insulation.

One commentor suggested that the conditioning requirements for the attic floor radiant panel and smoldering combustion tests be changed to correspond to those conditions in the regions where the insulation is sold.

The Commission does not have sufficient evidence to indicate that it would be necessary or practical to specify separate testing requirements for different regions of the country.

One commentor suggested that the definition of cellulose insulation in the proposed amendment should exclude insulation made of virgin wood fiber from wood chips, where the fiber is impregnated with fire retardant chemicals. The commentor stated that cellulose insulation made from shredded newspaper and newsprint with dry mixed fire retardant chemicals produced insulation of inconsistent quality. However, according to the commentor the virgin wood fiber insulation is produced through a reliable standardized production method.

Information presently available to the Commission does not indicate that wood fiber cellulose insulation should be subject to different requirements than cellulose insulation made from pulverized newspaper.

One commentor suggested that the present interim standard, using the Steiner tunnel flame resistance test, would adequately protect consumers if the smoldering combustion test of HH-I-515D were added.

The Commission believes that the attic floor radiant panel test should be substituted for the Steiner tunnel, since according to NBS, the attic floor radiant panel test better simulates the fire hazards associated with cellulose insulation installed on an attic floor.

One commentor stated that there were inconsistencies in the conversions from English to metric units for several dimensions. The commentor also stated that some of the conversions implied an unneeded precision.

The Commission has included appropriate corrections in the proposed amendment to address these inconsistencies and avoid an implication of unneeded precision.

One commentor claimed that the floor resistance tests in the proposed amendment may not be adequate to address problems associated with cellulose insulation installed in wall spaces. Another commentor questioned whether the attic floor radiant panel is applicable to insulation installed in locations other than attics.

Although the radiant panel test method has not been shown to be applicable to fire hazards associated with cellulose insulation installed in locations other than attics, the smoldering combustion test method, another flame resistance test method in the proposed amendment, is, according to NBS, applicable to cellulose insulation installed in locations other than attics. The smoldering combustion test method is applicable to cellulose insulation installed in vertical configurations, including cellulose insulation installed in wall spaces. The Commission is not aware of any other flame resistance test method, that would be appropriate for cellulose insulation installed in wall spaces.

One commentor claimed that the proposed amendment should consider wet process flame retardants instead of dry salt flame retardants, since the dry salt retardants result in a significant loss of flame retardant due to mechanical fall-off.

The proposed amendment does not specify the use of either wet process flame retardants or dry salt flame retardants. Either wet process or dry salt flame retardants could be used, provided the cellulose insulation product complies with the flame resistance and corrosiveness test requirements of the amendment. The Commission has no facts to support the allegations that dry salt flame retardants are not permanent, or that this lack of flame

resistance permanency could result in a hazard to consumers.

One commentor claimed that the proposed amendment should include starch content testing, since starch is a nutrient that tends to attract rodents. The same commentor also stated that the interim standard should include provisions to address fungal growth, although the commentor did not state a reason for including fungal growth provisions.

The proposed amendment does not include the starch content or fungal growth provisions of HH-I-515D, since these provisions are not part of the flame resistance or corrosiveness provisions of HH-I-515D. As provided in the act, the proposed amendment includes only those parts of HH-I-515D that are revisions to the flame resistance and corrosiveness provisions of HH-I-515C.

Economic considerations. Several commentors raised issues concerning the economic impact of the proposed amendment. Based on an economic analysis of the industry and the likely effect of the proposed amendment, the Commission believes that the potential impact of the proposed amendment will be small since (1) many companies have gone out of business before and since the issuance of the interim standard, as a result of the decline in demand for the product, and (2) it is likely that the most severe economic impacts will be associated with the present interim standard and will have occurred before the proposed amendment is adopted. (For the purposes of the Commission's economic analysis, the Commission believes that smaller cellulose insulation firms should be considered to be firms with annual sales under $1 million. In 1977, a period of high demand, the average annual sales for small firms was $200,000. The Commission recognizes, however, the demand has declined significantly since the 1977 levels.)

One commentor claimed that the radiant panel test method in the proposed amendment would require manufacturers to spend thousands of dollars in order to adjust present formulations or try new formulations to pass the radiant panel test.

The Commission believes that testing costs will vary depending upon the size and technical competence of the manufacturer. For example, it appears that in most cases the testing cost associated with finding an acceptable chemical formulation will be relatively small. Most of the large manufacturers will have the internal capability of performing this task. Most of the other manufacturers will probably purchase the appropriate chemical formulation as a pre-mix—and will experience no direct development costs.

One commentor stated that sudden implementation of the proposed test changes could hurt small firms as a result of the high costs of the tests and the limited number of laboratories that have the radiant panel test equipment.

The Commission believes that the proposed effective date (October 16, 1979) should minimize any adverse effect caused by the change in requirements and test methods. Based on an economic analysis of the industry, the Commission believes that this date should provide manufacturers with time to comply with the new requirements.

There are approximately twelve commercial testing laboratories which have demonstrated expertise in the area of testing cellulose insulation. There are five major laboratories that have obtained national stature and are well recognized by consumers. One of these laboratories has informed the Commission staff that half a dozen independent laboratories alone could handle all demand for qualification and follow up testing with present testing capacity.

Several commentors stated that the interim standard and the proposed amendment will have a significant impact on the industry, resulting in an approximate 13 percent increase in manufacturing costs and an approximate 25 percent increase to the installer and consumer. According to the commentor increased chemical requirements reduce product coverage 10 percent to 20 percent, resulting in an overall price increase of 35 percent to 45 percent to the consumer. Another commentor stated that increased costs to consumers would be between 30 to 50 percent. One commentor, a manufacturer of cellulose insulation, stated that there would be no need to increase prices because of the proposed amendment and suggested that the economic objections of other manufacturers were without foundation.

At present, the Commission believes that the interim standard currently in effect will increase chemical costs to cellulose insulation manufacturers by at most 12 or 13 percent. The Commission estimates that manufacturing cost impacts of the present interim standard have resulted in approximately a 6 percent increase in price per production unit (bag) at the retail level. For 1979, price increases at the retail level will be considerably less than in 1978 because of greater availability of the product. As a result of the reduction in R-value (a measure of the thermal resistance of insulation) due to the addition of more chemicals industry sources have indicated to the Commission that about 8 or 10 percent more insulation is likely to be needed to obtain the same R-value.

Considering both the increased volume requirement and the additional manufacturing costs, the Commission estimates that for the present interim standard the increased price of insulating a 1,200 square foot attic to an R-19 level is $20 to $25. This represents an approximate 15% increase in price to the consumer as a result of meeting the present interim standard.

The Commission anticipates that the impact on manufacturing cost and consumer prices of the proposed amendment as compared to the interim standard will be very minor. For the proposed amendment, chemical costs are expected to increase by only 1 or 2 percent. At the retail level, the price may increase by one percent. Because the chemical loading that would be necessary to meet the requirements of the proposed amendment is similar to that necessary to meet the present interim standard, the chemical loading should not influence the thermal properties of the insulation. As a result, an additional amount of insulation should not be necessary to achieve the appropriate thermal resistance. In terms of costs to the consumer, the impact of the proposed amendment represents an approximate increase of $1.60 over the cost of meeting the present interim standard for a 1,200 square foot attic insulated at an R-19 rating.

One commentor stated that the present interim standard should remain in effect since the proposed amendment based on HH-I-515D is unnecessary to protect consumers and since the proposed amendment would cause financial and operational problems for manufacturers and increased cost to consumers. The commentor stated that there has been no loss of life and only negligible property damage attributable to insulation that meets HH-I-515C. The commentor also claimed that compliance with the proposed amendment would require each manufacturer to spend between $10 and $20 thousand, as well as time lost from obtaining business.

Many industry experts feel that the requirements of the proposed amendment are more difficult than those imposed by the interim standard. For instance, it appears that cellulose insulation manufacturers will need more skill and technical knowledge to resolve problems associated with the smoldering combustion test. Manufacturers will probably need a precise mixture of chemicals for their product to comply with this test requirement. Some manufacturers will have these skills; others will rely upon pre-mix formulations and/or consultants, and a few smaller companies are expected to go out of business because of declin-

ing markets and increasing costs. A small manufacturer who: (1) finds it necessary to hire a full time skilled technician to supervise the quality control operation and (2) fails in an initial attempt to obtain product certification might incur expenses approaching $20,000. However, this would not be the case for most firms. Although the Commission does not have fire incident information that could be used to assess the effects of the interim standard based on HH-I-515C, the Commission believes that the flame resistance and corrosiveness test methods of the proposed amendment better simulate hazards associated with cellulose insulation. (In the next section of this preamble, the Commission discusses the available information it has that would support a determination that the proposed amendment is necessary to protect the public).

One commentor stated that the proposed amendment would be burdensome to small manufacturers as a result of the testing requirements and suggested that manufacturers be allowed to use third party laboratories to conduct testing.

The standard itself does not require manufacturers and private labelers to conduct testing; however, Section 14 of the Consumer Product Safety Act requires manufacturers and private labelers to issue a certificate that the product complies with the standard, and to base that certificate on either a test of each product or on a reasonable testing program. Elsewhere in this issue of the FEDERAL REGISTER, the Commission has proposed a certification regulation that prescribes certification requirements. In proposing the certification requirements, the Commission has attempted to minimize the burden on manufacturers and private labelers. Some portions of the certification requirements may be met by using independent laboratories to conduct testing.

V. STATUTORY FINDINGS

Section 35 (a)(2)(F) of the act, as amended, provides that the Commission must issue the amendment to the interim consumer product safety standard unless the Commission determines, after consultation with the Secretary of Energy, that (1) the amendment is not necessary for the protection of the consumer from the unreasonable risk of injury associated with flammable or corrosive cellulose insulation; or (2) implementation of the amendment will create an undue burden on persons who are subject to the interim consumer product safety standard. The *Conference Report* to Pub. L. 95-319 emphasizes that the Commission has an affirmative obligation to adopt the amendment to the interim standard. The Commission should not adopt the amendment only if the Commission makes a determination that the amendment is unnecessary or unduly burdensome. (H.R. Rept. No. 95-1322, 95th Cong., 2d sess. 8 (1978)).

A. DETERMINATION WHETHER THE AMENDMENT IS NOT NECESSARY TO PROTECT THE CONSUMER

Congress required the Commission to issue the present interim standard after finding that an interim standard is reasonably necessary to eliminate or reduce an unreasonable risk of injury to consumers from flammable or corrosive cellulose insulation (sec. 2(a)(4), 15 U.S.C. 2051 note, Pub. L. 95-319). In the House Committee report concerning this legislation, the members of the House Committee on Interstate and Foreign Commerce based the need for the legislation, in part, on the fact that no Federal mandatory safety standard existed to ensure the safety of insulation purchased by consumers. The House Committee members stated that the absence of a standard exposed the consumer to risks from fire and corrosion damage from untreated or improperly treated cellulose home insulation. According to the House Report, unless a safety standard is enacted, fires caused by flammable cellulose insulation are likely to increase and the potential for serious injury to the occupants of these homes is substantial. (H.R. Rept. No. 95-1116, 95th Cong., 2d Sess. 2 (1978)).

As Congress instructed, the Commission issued the present interim standard based on HH-I-515C. The interim standard applies to all cellulose insulation manufactured after September 7, 1978. Since Congress has already concluded, in requiring the present interim standard, that a standard is needed to protect the public from the unreasonable risk of injury from fires and corrosion associated with cellulose insulation, the Commission does not believe that it is appropriate to reevaluate the need for a standard in considering whether the proposed amendment is necessary. Instead, the Commission believes it should base a decision as to the need for the proposed amendment on an evaluation of the adequacy of the present interim standard and the need for the proposed amendment in terms of serving the Congressional purpose of protecting the public. The Commission discusses below the information it has that compares the proposed amendment and the present interim standard in terms of protection of the public.

In submitting comments on the issue whether the amendment is necessary to protect the public, the Commission believes that commentors should compare the proposed amendment with the present interim standard. The Commission emphasizes that unless it obtains information showing that the amendment is not necessary to protect the consumer, the Commission will not make a finding that the amendment is unnecessary.

At the present time the Commission has the following information that would support a determination that the proposed amendment is necessary to protect the public.

Flame resistance requirements and test procedures of the proposed amendment. (1209.3(b), 1209.6, 1209.3(c), 1209.7)

The Center for Fire Research of the National Bureau of Standards (NBS) has prepared for the Commission a technical rationale for the flame resistance provisions of HH-I-515D (*Technical Rationale for the General Services Administration Federal Specification HH-I-515D Flame Resistance Provisions,* Center for Fire Research, National Bureau of Standards, December 1, 1978). The technical rationale includes references to other studies and documents. A copy of this technical rationale and supporting documents is available in the Office of the Secretary of the Commission. The Commission has analyzed and reviewed this technical rationale and accompanying documents, and, based on presently available information, agrees with the conclusions in the NBS technical rational.

Requirements and test procedures for smoldering combustion. According to the NBS technical rationale, a review of fire incident data showed that smoldering was the most likely hazard associated with cellulose insulation. The NBS technical rationale stated that more than 80 percent of the fires associated with insulation involved cellulose insulation and were started by overheated electrical light fixtures, and other electrical sources, and heated flues. NBS studies indicated that when exposed to a heat source, either in an attic or a side wall, cellulose insulation could be induced to smolder unless properly treated. According to NBS, heat sources such as recessed lighting fixtures and glowing wire connections in side walls could result in temperatures in excess of 260°C (500°F) when insulation contacted the heat sources. Temperatures as high as this are sufficient to induce smoldering.

The smoldering combustion test procedures and requirements have been included in the revised GSA Specification HH-I-515D and in the proposed amendment since the flame resistance test of the present interim standard, based on GSA Specification HH-I-515C, does not address the smoldering combustion problem. The smoldering combustion test in the proposed

amendment uses a lighted cigarette as the ignition source. If smoldering is likely to occur with the test material, the lighted cigarette has a sufficiently high temperature (approximately 700°C in the very small glowing region) to initiate smoldering. The test method is intended to determine whether the smoldering will continue in the insulation if smoldering has started. In order to pass the test, the test specimen must have a weight loss of less than or equal to 15 percent and must not exhibit flaming combustion. The weight loss requirement is based on data showing that, if a product does not exhibit smoldering tendency, the weight loss of the specimen would be 1 to 4 percent, while if the product smolders the weight loss would be from 30 to 35 percent or higher. According to NBS, because of the nature of the test results, a weight loss criterion midway between these values is reasonable. The flaming combustion criterion was also chosen as an appropriate criterion to eliminate the most severe failure situation. According to NBS, the smoldering combustion test requirement will ensure that insulation materials have some resistance to smoldering. This would represent an improvement over the present interim standard, which does not contain any test requirement that is designed to ensure that insulation materials have some resistance to smoldering.

Requirements and test procedures for critical radiant flux. The present interim standard, based on GSA Specification HH-I-515C, uses the Steiner tunnel test method (ASTM E-84) to assess flame resistance. This test method applies a fixed orientation and exposure for all materials tested, regardless of the end use configuration of the product. In the technical rationale prepared for the Commission, NBS examined the Steiner tunnel test method of HH-I-515C and concluded that this test method is inappropriate for testing cellulose insulation installed on the floor of an attic. According, to NBS, cellulose insulation is not normally applied over a metal screen and is not likely to be exposed to flames from below, as is done in the Steiner tunnel test. In addition, NBS stated that in a typical attic fire, the cellulose insulation is not subjected to a 5000 Btu/min fire and/or a wind velocity of 240 ft/min, as is done in the Steiner tunnel test. According to NBS the Steiner tunnel test has been shown to be invalid for low density fire retardant treated plastic foams, so that the applicability and appropriateness of this thest method for other low density materials is also questionable. According to NBS, cellulose insulation that has not been treated with fire retardant chemicals has been reported to have flame spread classifications from 50 to 120 when tested in the Steiner tunnel. However, in actual fire situations these materials burn more rapidly than plywood having supposedly less flame resistant flame spread classifications, ranging from 150 to 200.

Unlike the Steiner tunnel test, the requirements and test procedures for critical radiant flux in the proposed amendment are intended to address the hazard scenario where insulation that is installed on the floor of the attic in still air and exposed to radiation from the roof is subjected to a small ignition source. According to NBS, cellulose insulation in this end-use configuration could become involved in such a hazard scenario. In this common end-use configuration, cellulose insulation is applied between and over floor joists in an attic, where the air is relatively still and the most severe exposure is likely to develop during periods of elevated outdoor temperatures plus solar radiation. A small ignition source, such as a dropped match or a carelessly applied propane torch, would be typical ignition sources.

The test method in the proposed amendment involves a radiant exposure varying from 0.1 to 1.1 W/cm^2, corresponding to the differences between direct solar radiation in the summer and the irradiance on the floor from a moderately severe flaming fire on the ceiling. Although the test method was originally developed for evaluating flooring systems in corridors that are exposed to radiation from fully developed fires in adjoining rooms, the test method was adapted for cellulose insulation. The test method provides that the cellulose insulation is exposed to a graded irradiance and ignited with a pilot burner at the high flux end of the specimen. The flux at the farthest point where the burning extends is the critical radiant flux. The proposed amendment would require cellulose insulation to have a critical radiant flux of greater than or equal to 0.12 W/cm^2.

According to NBS, this test requirement represents a minimum level for safety. NBS obtained the test requirement by estimating attic temperatures and adding a safety factor. If insulation meets the test requirement, then a fire should not propagate in the attic insulation. NBS has conducted large scale attic mock-up tests which support the attic floor radiant panel test and the criterion for passing the test. According to NBS, Underwriters Laboratories has conducted tests which lead to the conclusion that cellulose insulation meeting the test requirements resists flame propagation under the highest ambient temperature conditions of the attic simulation fire test.

The NBS technical rationale points out that there is limited data to support a correlation between the critical radiant flux measurement used in the proposed amendment and the flame spread classification measurement obtained in the present interim standard. The flame spread classification of 25 required to pass the present interim standard may be either above or below the critical radiant flux of 0.12 W/cm^2 that would be required to pass the proposed amendment.

Test Method Precision for Flame Resistance. As part of the development of the flammability test methods for HH-I-515D, NBS conducted an interlaboratory program to evaluate the repeatability and reproducibility of the flame resistance test methods for cellulose insulation. The results of this study are in a report titled, "Interlaboratory Evaluation of the Attic Flooring Radiant Panel Test and Smoldering Combustion Test for Cellulose Thermal Insulation", J. Randall Lawson, Center for Fire Research, National Bureau of Standards, January 1979. A copy of this study is available in the Office of the Secretary of the Commission.

The results of the interlaboratory program for the critical radiant flux determination showed that the pooled coefficient of variation for repeatability between test results in the same laboratory was 12 percent and the average coefficient for reproducibility between test results in different laboratories was 21 percent. According to NBS, these values are not significantly greater for cellulose insulation than for other materials. In addition, these values compare favorably with precision estimates available from other standard fire tests.

For the smoldering combustion test, eight of ten laboratories agreed for six of the seven materials tested. Seven of ten laboratories agreed on the seventh material. Although, as a result of the split test results, NBS did not place the data for the smoldering combustion test through a rigorous statistical analysis, agreement among the laboratories was relatively good. According to NBS, some variation in laboratory procedures may have contributed to the split test results.

Based on the information obtained from the interlaboratory study, NBS concluded that there is reasonable assurance that there will be consistent results from different laboratories evaluating the same material for compliance with the smoldering combustion and radiant panel tests.

Test procedures and requirements for corrosiveness (1209.3(a) and 1209.5). The Commission has the following information that would support a determination that the corrosiveness requirements and test procedures of the

proposed amendment are necessary to protect the public. NBS prepared a critiques of the corrosiveness test methods for the present interim standard and the proposed amendment based on HH-I-515D. A copy of this critique is available in the Office of the Secretary of the Commission.

The corrosiveness test procedures in HH-I-515D, which form the basis of the corrosiveness test procedures in the proposed amendment, differ from the test procedures in the present interim standard in the procedure for preparing the metal coupons and insulation specimens, the type of coupons used in the test, the amount of time the specimens are left in the humidity chamber and the coupon post-cleaning. Based on the NBS critique, the Commission has included several changes to the corrosiveness test procedures of HH-I-515D in the proposed amendment. These changes are explained in greater detail in the section of this notice titled: *III. Commission Proposed Changes to the Flame Resistance and Corrosiveness Provisions of HH-I-515D.* The most significant changes involve improvements for cleaning and handling the test coupons so that the test is conducted on metal coupons that are free of contaminants; preparation of the test specimens to address variability due to possible separation of dry chemicals from the insulation, to improve the homogeneity of the test specimens, and to ensure continuity between composite specimens; and changes to avoid moisture evaporation from the specimens after they have been prepared. NBS has evaluated and concurred in these changes.

Based on presently available information, the Commission believes that the corrosiveness requirements and test procedures in the proposed amendment are a significant improvement over the requirements and test procedures of the present interim standard. The Commission believes that the test procedures in the proposed amendment should be more reproducible than the procedures in the present interim standard, since the proposed amendment has eliminated much of the subjectivity and other sources of potential variability in the present interim standard.

B. DETERMINATION WHETHER THE AMENDMENT WOULD CREATE AN UNDUE BURDEN

At the present time, the Commission has the following information regarding the degree of burden of the proposed amendment on persons subject to the interim standard.

The Commission has prepared a draft economic analysis of the potential economic impacts of the proposed amendment. This economic analysis is based on research conducted for the Commission. A copy of the Commission's Economic Analysis dated December 6, 1978 and a draft final copy of the research report dated November 29, 1978 is available in the Office of the Secretary of the Commission.

The economic analysis assesses the incremental impact of the proposed amendment relative to the interim standard that is presently in effect. In order to determine the potential impact of the interim and proposed standard, a "base line" has been established from which the economic impact can be estimated.

The base line considers the supply and demand situation for cellulose insulation that existed before the interim standard as well as an estimate of the situation that would have existed in the future if the interim standard had not been enacted. The base line is important since much of the present decline in cellulose insulation industry sales volume may be attributed to a shift in demand unrelated to the implementation of the safety standard. The base line analysis reveals the following:

(1) Between 1977 and 1978, the production of cellulose insulation has decreased 66 percent;

(2) A large percentage of the total decrease in production of cellulose insulation occurred during the first half of 1978; and

(3) The demand for cellulose insulation should remain between 400 million and 550 million pounds per year during most of the next decade.

Some of the cellulose insulation manufacturers who commented on the Commisssion's notice of intent or were interviewed supported the requirements and test procedures that form the basis of the proposed amendments, while others disagreed with the proposed changes and have indicated that the tests are not specified in sufficient detail and that, consequently, test results are conflicting and nonreproducible. Where necessary, the Commission has made several changes in the proposed amendment in order to address these criticisms.

In light of the significant differences of opinion among manufacturers on technical aspects of the standards, the Commission's economic analysis is based upon two sets of assumptions. These assumptions represent the most optimistic and most pessimistic situations which could result rom the interim standard and the proposed amendment.

The most optimistic assumptions are that 90 percent of the present cellulose manufacturers are able to comply with the present interim standard, while the remaining 10 percent, small firms which represent approximately 3 to 6 percent of the industry's capacity, will go out of business. (For the purposes of the Commission economic analysis, the Commission believes that smaller cellulose insulation firms should be considered to be firms with annual sales under $1 million. In 1977, a period of high demand, the average annual sales for small firms was $200,000. The Commission recognizes, however, that demand has declined significantly since the 1977 levels.) Under the most optimistic assumption, of the 90 percent of cellulose insulation manufacturers that complied with the interim standard based on HH-I-515C, approximately 75 percent will also be able to comply with the proposed amendment based on HH-I-515D. Companies who are unable to comply with the proposed amendment will leave the cellulose insulation business.

The most pessimistic assumptions are that only 10 percent of the cellulose insulation manufacturers are complying with the present interim standard. These companies are large and medium size companies that currently represent 55 to 65 percent of the production capacity of the industry. The remaining 90 percent of the manufacturers will discontinue their cellulose insulation business. Under the most pessimistic assumption, of the 10 percent of the cellulose insulation manufacturers who are able to comply with the present interim standard, all will be able to comply with the proposed amendment.

Based on presently available information, the Commission believes that the proposed amendment, if adopted, would increase chemical costs by 1 or 2 percent depending on the type and quantity of fire retardant chemicals being utilized. Because the chemical loading that would be necessary to meet the requirements of the proposed amendment is similar to that necessary to meet the present interim standard, the chemical loading should not influence the thermal properties of the insulation. As a result, an additional amount of insulation should not be necessary to achieve the appropriate thermal resistance for any given application. The Commission's economic analysis concludes that the proposed amendment to the interim standard would have little impact on retail prices.

Based on the aforementioned assumptions, the maximum adverse impact of the proposed amendment would include the following:

(1) About 100 small companies would be forced to leave the insulation manufacturing business;

(2) Approximately 500 workers would become unemployed;

(3) Cellulose insulation prices probably would increase by about 1 percent at the retail level;

(4) A consumer would pay $1 to $2 more to insulate a 1,200 square foot attic to a value of R-19.

The Commission estimates that the labeling requirement of the proposed amendment will have a minimal economic impact, since this provision would not require manufacturers and private labelers to alter the product and since manfacturers and private labelers are currently required to label their product under the interim standard. The Commission believes that the proposed effective date of October 16, 1979 will allow most manufacturers and private labelers time to draw down inventories of bags with non-complying labels and therby avoid the need for hand-stick-on labels. At worst, even if inventories are not depleted and hand-stick-on labels are use, the Commission estimates that these labels would add approximately 2½ cents to the cost of each bag of insulation, as well as an application cost of at most 4 cents per bag during the limited production period.

Testing and certification costs resulting from the Commission's certification requirements (proposed elsewhere in this issue of the FEDERAL REGISTER) will vary depending on the size and technical competence of the manufacturer or private labeler. In most cases, the testing costs associated with finding an acceptable chemical formulation will be relatively small since (1) most large manufacturers and private labelers will have the internal capability of performing these tests and, (2) most of the remaining manufacturers and private labelers will probably purchase the appropriate chemical formulation as a premix, thus experiencing no direct development and testing costs. The potential economic impact of the proposed certification rule is discussed in greater detail in the preamble of the proposal.

VI. ENVIRONMENTAL CONSIDERATIONS

The Commission has examined the potential environmental impacts of the proposed amendment, including the potential environmental impact of the proposed amendment on energy usage, the substitution of urea-formaldehyde insulation and increased demand for boric acid. (There potential environmental impacts are further discussed in the preamble to the proposed certification rule, published elsewhere in this issue of the FEDERAL REGISTER.) Based on a draft environmental assessment of the proposed amendment, the Commission believes that the proposed amendment will have no significant environmental impact affecting the quality of the environment that would require the Commission to prepare an environmental impact statement. A copy of the draft environmental assessment is available in the Office of the Secretary of the Commission.

VII. REQUEST FOR COMMENTS

In the Congressional *Conference Report* on Pub. L. 95-319, the conferees stated there expectation that any member of the public who objects to the proposed amendment will make available to the Commission whatever information is necessary in order for the Commission to fully analyze the impact of the amendment (H. R. Rept. No. 95-1322, 95th Cong., 2d. Sess. 8 (1978)). The Commission is especially interested in receiving comments that address the issues: (1) whether the amendment is necessary to protect consumers from the unreasonable risk of injury associated with flammable or corrosive cellulose insulation and (2) whether implementation of the amendment will create an undue burden on the persons subject to the interim standard. As emphasized in the *Conference Report*, the Commission will issue the amendment unless the Commission finds that the amendment is not necessary or will create an undue burden.

In order to be most helpful to the Commission, comments should discuss specific issues raised in this notice as well as any other issues the commentors believe are important. Whenever possible comments should include all of the information and data forming the basis of any conclusions or opinions stated in the comment.

The Commission has only a short amount of time (90 days) to consider comments and decide whether to issue a final amendment. In order to help the Commission evaluate comments in this short time, commentors should carefully organize their comments and refer specifically to each section number of the proposal that is relevant to the issue being discussed. Where the commentor raises a general issue or miscellaneous issue not related to a specific section of the proposal, the commentor should group these issues in a separate section of the comment.

Comments must be received in the Office of the Secretary of the Commission by April 9, 1979. The 30 day comment period is specifically provided by section 35(c)(2)(E) of the act, as amended, and may not be extended by the Commission. As a result of the short amount of time provided by the act for issuing any final amendment, it will not be practicable for the Commission to consider any comments that are received after April 9, 1979. Comments should be submitted to the Office of the Secretary, Consumer Product Safety Commission, Washington, D.C. 20207.

VIII. OPPORTUNITY TO SEEK JUDICIAL REVIEW

Section 35(c)(2)(G) of the act, as amended by Pub. L. 95-319, provides that the provisions of section 11 do not apply to judicial review of any amendment to the interim standard. For the purposes of fairness to all interested parties concerning the opportunity to seek judicial review of any final amendment, the Commission believes it is important to set a specific date and time at which the final amendment is considered to be final agency action under section 704 of the Administrative Procedure Act (5 U.S.C. 704). The Commission proposes that this date and time shall be at one o'clock p.m. Eastern Daylight Time, on the date that is ten days, as computed under the Federal Rules of Civil Procedure, after the date any final amendment is published in the FEDERAL REGISTER. The Commission believes that this date and time is reasonable since it will provide all interested parties an equal and fair opportunity to review the final amendment before deciding whether they wish to seek judicial review. Moreover, the Commission does not believe that interested parties will be adversely affected by having to wait the ten day period before seeking judicial review, since the Commission intends to publish any final amendment on or before July 6, 1979. A ten day period after this date would be substantially before the proposed delayed effective date of October 16, 1979.

IX. CONCLUSION AND PROPOSAL

In accordance with the provisions of the "Emergency Interim Consumer Product Safety Standard Act of 1978", Pub. L. 95-319, the Commission proposes the revised flame resistance and corrosiveness provisions of GSA Specification HH-I-515D, along with the changes described below, as an amendment to the Commission's interim standard for cellulose insulation.

Therefore, pursuant to provisions of the Consumer Product Safety Act, as amended (sec. 35 (c)(2), Pub. L. 95-319, 92 Stat. 388-389, 15 U.S.C. 2082), the Commission proposes to amend the Interim Safety Standard for Cellulose Insulation by substituting a new Part 1209 of Title 16 CFR, for the present 16 CFR Part 1209 published at 43 FR 35240 (August 8, 1978), as follows:

PART 1209—INTERIM SAFETY STANDARD FOR CELLULOSE INSULATION

Subpart A—The Standard

Sec.

AUTHORITY: Sec. 35(c)(2), Pub. L. 95-319, 92 Stat. 388-389; (15 U.S.C. 2082).

Subpart A—The Standard

§ 1209.1 Scope and application.

(a) *Scope.* This part 1209, and interim consumer product safety standard, prescribes flame resistance and corrosiveness requirements for cellulose insulation that is a consumer product. These requirements are intended to reduce or eliminate an unreasonable risk of injury to consumers from flammable and corrosive cellulose insulation. The requirements are based upon the flame resistance and corrosiveness requirements of General Services Administration Specification HH-I-515D.

(b) *Application.* This part 1209 shall apply to cellulose insulation that is a consumer product, that is, cellulose insulation produced or distributed for sale to, or for the personal use, consumption, or enjoyment of consumers in or around a permanent or temporary household or residence, a school, in recreation, or otherwise. The interim standard applies to cellulose insulation that is produced or distributed for sale to consumers for their direct installation or use, as well as cellulose insulation that is produced or distributed for installation by professionals. This part 1209 applies only to cellulose insulation manufactured after October 15, 1979.

§ 1209.2 Definitions.

As used in this part 1209:

(a) "Cellulose insulation" means cellulosic fiber, loose fill, thermal insulation that is suitable for blowing or pouring applications. The definition includes insulation installed using the "wet process" method of installation. The "wet process" insulation is blown into an area with a spray or mist of water applied at the nozzle during installation.

(b) The definitions given in section 3 of the Consumer Product Safety Act are applicable to this part 1209.

(c) For the purposes of conformance with the technical requirements of this standard, the figures are given in the metric system of measurement. The inch-pound system approximations of these figures are provided in parentheses for convenience and information only. For numerical quantities for which no specific tolerances are given, the tolerance shall be one half of the unit value of the last significant digit given in the dimension. Where numerical quantities are given without tolerances in both the metric and inch-pound system of measurements, the tolerance shall be one half of the last significant digit of the metric equivalent of the numerical quantity.

(d) The specifications and dimensions in the test methods below are given in metric units, with the English equivalents in parentheses. For enforcement purposes the Commission will use metric units.

§ 1209.3 General requirements.

(a) All cellulose insulation to which this interim standard applies, as described in § 1209.1, shall be noncorrosive when tested in accordance with the test procedures at § 1209.5 and evaluated using the criteria at § 1209.5(c). This means that after the product is tested, the six metal coupons used in the test shall not have any perforations (excluding notches extending into the coupon 1 mm or less from any edge) when the coupons are observed over a 40-W appliance light bulb.

(b) All cellulose insulation to which this interim standard applies, as described in § 1209.1, shall have a critical radiant flux equal to or greater than 0.12 w/cm^2 for each of the three specimens when tested in accordance with the test procedures as § 1209.6.

(c) All cellulose insulation to which this interim standard applies, as described in § 1209.1, shall have no evidence of flaming combustion and shall also have weight loss of 15 percent or less of the initial weight, for each of the three speciments, when tested in accordance with the test procedures at § 1209.7.

(d) All containers of cellulose insulation to which this interim standard applies, as described in § 1209.1, shall have a labeling statement in accordance with the labeling requirements at § 1209.9.

§ 1209.4 Test procedures for determining settled density.

The settled density of loose fill insulation must be determined before the corrosiveness test (1209.5) and the smoldering combustion test (1209.7) can be performed. This section decribes the procedure for determining the settled density of loose fill insulation.

(a) *Apparatus and materials:* (1) An insulation specimen container constructed of glass with a flat bottom (approximate inside diameter of 15 cm (5.9 in), straight sides (without a flared lip or spout), and a total volume of 3.5 to 5 liters (213.6 to 305.1 cu in) (Apparatus #1).

(2) A flat-rigid disc with a total weight of 75±5 g (2.65±0.18 oz) and of a suitable diameter to fit loosely into the specimen container. Weight may be added to the center of the disc to bring the total weight to the required 75±5 g (Apparatus #2).

(3) A balance of 2 kg (4.4 lbs) capacity accurate at least to 0.2 g (0.007 oz) (Apparatus #3).

(4) Blower apparatus, two units (supply and overflow) meeting the following specifications: (The Commission staff has found that a Breuer Electric Manufacturing Co., Model 98805 blower is suitable for this purpose, although other blowers may be suitable.) (Apparatus #4).

(i) Each blower apparatus shall be capable of blowing an average of 272.2 kg (600 lbs.) of insulation per hour.

(ii) Each blower apparatus shall have a nominal air flow of 2.1 cm^3/min. (75 ft^3/min.)

(iii) Each blower apparatus shall have a nominal motor speed of 16,450 revolutions per minute at 115 VAC.

(5) A shaker unit capable of shaking 4.5kg (10 lb) of weight with a vertical motion of 0.5 g Root Mean Square (RMS) acceleration at an approximate frequency of 9 Hertz (Hz) and displacement of approximately .25 cm (0.1 in) peak to peak. (The Commission staff has found that a Tyler Industries, Portable Sieve Shaker Model Rx-24 is suitable for this purpose, although other shakers may be suitable.) (Apparatus #5).

(6) Fill chamber—45.7 cm (18 in) high × 38.1 cm (15 in) wide × 38.1 cm (15 in) deep (see Figure 1 for details) (Apparatus #6).

(7) A cyclone receiver (see Figure 2 for complete details.) (Apparatus #7).

(8) Various lengths of nominally 2-inch diameter hose (see Figure 1 for details), as follows:

(i) A supply source hose, 274.3 ± 5.1 cm (9 ft ± 2 in) (Apparatus #8(i)).

(ii) A cyclone receiver hose, 182.9 ± 5.1 cm (6 ft ± 2 in) (Apparatus #8(ii)).

(iii) A fill chamber exit hose, 91.4 ± 5.1 cm (3 ft ± 2 in) (Apparatus #8(iii)).

(iv) An overflow exhaust hose, length as needed (Apparatus #8(iv)).

(9) Blower Control(s) capable of operating the two blowers at 40 volts RMS. As an example, a variac for each of the two blowers with sufficient rating to operate at 40 volts and 12 amperes RMS would be acceptable (Apparatus #9).

(10) An insulation holding box to hold a sufficient quantity of insulation to fill the specimen container four times.

(11) A garden rake, 50.8 cm (20 in) wide (Apparatus #11).

(12) A shovel (Apparatus #12).

(b) *Conditioning:* Specimens shall be conditioned to equilibrium at 21 ± 5°C (69.8 ± 9°F) and 50 ± 5% relative humidity. A less than 1% change in net weight of the specimen in two consecutive weighings with two hours be-

tween each weighing constitutes equilibrium.

(c) *Test specimen preparation:* (1) *Insulation intended for pneumatic applications.* If the insulation is intended for pneumatic applications, the test specimens shall be prepared in the following manner:

(i) If ambient laboratory conditions are different from the conditioning requirements specified in (b) above, begin testing the specimen within 10 minutes after it has been removed from the conditioned area.

(ii) Pour the conditioned insulation into the holding box (Apparatus #10) in sufficient quantity to fill the specimen container (Apparatus #1 shown in Figure 1) four times. Manually break up any large clumps of material that might cause feeding problems.

(2) *Insulation intended for pouring applications:* If the insulation is intended for pouring applications, the test specimens shall be prepared in the following manner:

(i) If ambient laboratory conditions are different from the conditioning requirements specified in (b) above, begin testing 10 minutes after it has been removed from the conditioned area.

(ii) Pour loose fill insulation into a simulated attic space until full. The attic space shall be formed by two nominal 2 x 6 243 cm (8 ft) long joists placed 40.6 cm (16 in) on center with 1.27 cm (½ in) plywood nailed to the ends and bottom. Fluff the material with a garden rake (Apparatus #11), applying a series of small amplitude strokes while moving the rake slowly along the joist. Repeat the fluffing process six times.

(d) *Procedures:*

(1) *Procedures for insulation intended for pneumatic applications.* If the insulation is intended for pneumatic applications, conduct the following procedures:

(i) The apparatus shall be set up as shown in Figure 1. (Apparatus #9 and #10 are not shown in Figure 1, but are described at § 1209.4(a)). Connect one end of the supply source hose (Apparatus #8.i) to the intake of the supply blower (Apparatus #4). The other end will be used to pick up insulation from the holding box (Apparatus #10). Connect one end of the cyclone receiver hose (Apparatus #8ii) to the outlet of the supply blower and the other end to the cyclone receiver (Apparatus #7). Connect one end of the fill chamber exit hose (Apparatus #8.iii) to the intake of the overflow blower (Apparatus #4) and the other end to the fill chamber (Apparatus #6). Connect one end of the variable length overflow exhaust hose (Apparatus #8.iv) to the outlet of the overflow blower. The other end should be conveniently placed to reduce insulation dust in the test area.

(ii) Weigh the empty insulation specimen container and record its weight.

(iii) Place the empty insulation specimen container in the fill chamber (Apparatus #6) centered under the cyclone receiver (Apparatus #7), and close the front cover.

(iv) Adjust the blower control(s) (Apparatus #9) such that the supply and overflow blowers will operate at a no load voltage of 40 volts RMS.

(v) Turn on the blowers simultaneously and proceed to fill the container by picking up material from the box using the supply source hose.

(vi) The container may fill unevenly, i.e. a void may tend to form off center in the container. If this occurs, stop the blowing process and rotate the container 180 degrees and continue the blowing process until the container just begins to overflow. If, for any reason, the filling process is interrupted for more than one minute or for more than the one time allowed to rotate the container, begin the process again.

(vii) Gently screed the excess material using a straight edge so as to leave a uniform surface of the insulation flush with the top of the container.

(viii) Weigh the filled and leveled container and record the weight. Take care not to bump or jar the container so as not to introduce any extraneous settling of the insulation.

(ix) Cover the container with the disc (Apparatus #2) to prevent spilling and secure the container to the shaker. Operate the shaker for a period of 5 minutes ± 15 seconds.

(x) Remove the container from the shaker and uncover, taking care not to bump or jar it. Lower the disc very slowly into the container until it starts to contact the insulation. At this point, release the disc and allow it to settle onto the insulation under its own weight.

(xi) Measure the volume of the space occupied by the settled insulation using the bottom edge of the disc as the upper datum point. If the disc is not level, measure the high and low points of the bottom of the disc and average the readings and use this as the height measurement in calculating the volume (V_s). This settled insulation volume and insulation weight (w) shall be used to calculate the settled density.

(xii) Repeat this procedure [steps (i through xi)] using another specimen of the insulation until four settled densities are obtained for a given material. Then average these figures to arrive at a final settled density.

(2) *Procedures for insulation intended for pouring applications.* If the insulation is intended for pouring applications, conduct the following procedures:

(i) Weigh the empty insulation specimen container and record its weight.

(ii) Using a shovel (Apparatus #12) remove insulation from the simulated attic space and place it into the specimen container until the container just begins to overflow.

(iii) Follow steps (vii) through (xi) as specified under *Procedures for insulation intended for pneumatic applications.*

(iv) Repeat this procedure (steps (i) through (iii)) using another specimen of the insulation until four settled densities are obtained for a given material. Then average these figures to arrive at a final settled density.

(e) *Insulation intended for pouring and pneumatic applications.* If the insulation is intended for both pouring and pneumatic applications, or if it is uncertain whether the insulation will be poured or installed pneumatically, the insulation shall be tested using the test specimen preparation and test procedures at § 1209.4(c) and (d) for each of the applications. The larger of the two settled density values shall be used in performing the corrosiveness test at § 1209.5 and the smoldering combustion test at § 1209.7.

(f) *Calculations:*

Calculate the settled density of each specimen using the following formula:

Settled Density in $kg/m^3 = W/V_s$, where

W = combined weight of the container and insulation in grams, minus the weight of the container in grams.

V_s = volume of insulation in liters after shaking.

§ 1209.5 Test procedures for corrosiveness.

This section prescribes the procedures for determining the corrosiveness of cellulose insulation. Cellulose insulation shall be tested for corrosiveness using the measured settled density, obtained by following the test procedure at § 1209.4, to calculate the amount of distilled or deionized water to add to the test specimens. Determination of corrosiveness shall be in accordance with the following test procedure:

(a) *Apparatus and materials.* (1) Humidity chamber. A forced-air humidity chamber capable of maintaining 48.9±1.7°C (120±3°F) and 97±1.5 percent relative humidity.

(2) *Crystallizing dishes.* Six glass crystallizing dishes, 90 mm (3.54 in) diameter by 50 mm (1.9 in) height.

(3) *Test coupons.* (i) Two aluminum coupons. 3003 bare aluminum, zero temper.

(ii) Two copper coupons. ASTM B 152, type ETP, Cabra No. 110 soft copper.

(iii) Two steel coupons. Low carbon, commercial quality, cold rolled, less than 30% carbon content, shim steel.

Each coupon shall be 50.8 by 50.8 mm (2 by 2 in) by 0.76 mm (0.0003 in) thick metal free of tears, punctures, or crimps.

(4) Test specimens: Six test specimens of insulation shall be used for one test. Each specimen shall weigh 20 g (0.7 oz).

(b) *Procedure.* (1) The metal coupons shall be cleaned by the following method, which provides first, a general procedure for all metal coupons and then specific procedures for the three types of metal coupons.

(i) *General procedures for cleaning all metal coupons.*

(A) At no time during the fabrication, cleaning or testing shall the metal coupons be touched by ungloved hands.

(B) Gloves shall be clean and in good condition.

(C) All chemicals used shall be of certified American Chemical Society reagent grade or better, free from oily residues and other contaminants.

(D) Water shall be distilled or deionized water.

(E) Handle cleaned coupons only with clean forceps.

(F) In order to avoid exposing laboratory personnel to toxic fumes, the Commission recommends that all cleaning procedures be performed in a fume hood.

(ii) *Specific procedure for cleaning copper coupons.* Clean copper coupons until completely free of water-breaks. A water-break is a break, separation, beading, or retraction of the water film as the coupon is held vertically after wetting. As the coupons are cleaned, the water film should become gradually thinner at the top and heavier at the bottom. Immerse the coupons in refluxing or boiling 1,1,1-trichloroe-thane (TCE) for 2 hours, or clean the coupons ultrasonically in TCE for at least 12 minutes. Rinse the coupons twice with fresh TCE. Air dry. Rinse the coupons with water. Inspect the coupons for water-break free surface. Hot air dry.

(iii) *Specific procedure for cleaning steel coupons.* Clean steel coupons until completely free of water-breaks. Immerse the coupons in room temperature TCE for 15 minutes with agitation. Rinse the coupons twice with fresh TCE. Air dry. Immerse the coupons in 5% by weight aqueous sodium hydroxide at 60°C for 15 minutes with occasional agitation. Rinse the coupons with water until no residual substance is present. Immerse the coupons in refluxing or boiling ethanol for 5 minutes. Rinse the coupons in fresh, room temperature ethanol twice. Rinse the coupons with water and inspect for a water-break free surface. Rinse with fresh ethanol and air dry.

(iv) *Specific procedure for cleaning aluminum coupons.* Clean aluminum coupons until completely free of water-breaks. Immerse the coupons with occasional agitation in room terperature TCE for 15 minutes, followed by rinsing the coupons with fresh TCE twice. Air dry. Immerse the coupons for one minute in 1.42 specific gravity nitric acid. Rinse the coupons with water until no residual acid is present. Inspect the coupons for water-break free surface. Hot air dry.

(2) Specimens of cellulose insulation submitted for testing shall be blown, combed, or otherwise mixed to reasonably assure homogeneity in the cellulose insulation test specimens.

(3) Before presaturating each 20g (0.7 oz) test specimen, subdivide it into two 10g (.35 oz) portions. The quantity of distilled or deionized water to be used for each 10g (.35 oz) portion shall be determined using the following the formula:

$$\text{ml distilled water} = \frac{40}{\text{settled density, Kg/m}^3} \times 75$$

or

$$\frac{2.5}{\text{settled density, lb/ft}^3} \times 75$$

(4) Presaturate each 10g (.35 oz) portion with the determined amount of water. Place one presaturated 10g (.35 oz) portion into a crystallizing dish, tamp level using the bottom of a clean suitably sized glass beaker. Place a metal coupon onto the presaturated insulation portion and center it in a horizontal plane. Place the other presaturated 10g (.35 oz) portion into the crystallizing dish on the metal coupon and tamp the composite specimens (metal coupon plus saturated insulation in the crystallizing dish) to assure an even distribution of this material and to assure good contact of the insulation with the metal.

(5) Do not cover the crystallizing dish. (Care should be taken to avoid evaporation from the composite specimen while it is being prepared until it is placed in the humidity chamber.) If dripping occurs in the chamber, position a drip guard in the chamber to divert condensation to the chamber floor. Repeat the above for the other metal coupons. Place all six composite specimens into the humidity chamber. The chamber shall be preconditioned to 48.9±1.7°C (120±3°F) and 97±1.5 percent relative humidity. The specimens shall remain in the chamber for 336±4 hours. (Keep the chamber door open a minimum of time while placing composite specimens in and removing them from the chamber.)

(6) Upon completion of the test, disassemble the composite specimens. Thoroughly wash the metal coupons under running water and lightly brush them using a nylon bristle brush or equivalent to remove loose corrosion products. Remove the remaining corrosion products from the metal coupons by cleaning them in accordance with the following practices: [1]

(i) *Technique No. 1—Electrolytic Cleaning.* This technique can be used for post-cleaning the tested copper, steel and aluminum coupons. Description. Electrolyze the coupons as follows: Make a solution containing 28 ml of sulfuric acid (specific gravity 1.84), 2 ml of organic inhibitor, e.g. about 0.5 g/liter of such inhibitors as diorthotolyl thiourea, quinoline ethiodide, or betanaphthol quinoline may be used, and 970 ml of water. The solution shall be at 75°C (167°F). The anode shall be carbon or lead, and the cathode shall be one metal coupon. The electrolyzing shall run for 3 minutes at a current density of 20 A/dm². *Caution:* If lead anodes are used, lead may deposit on the coupon. If the coupon is resistant to nitric acid, the lead may be removed by a flash dip in 1+1 nitric acid (plus water).

(ii) *Technique No. 2—Copper.* This technique or Technique No. 1 can be used for post-cleaning the tested copper coupons only.

Description. Make a solution containing 500 ml of hydrochloric acid (specific gravity 1.19), 100 ml of sulfuric acid (specific gravity 1.84), and 400 ml of water. The solution shall by at room temperature. Dip the coupons in the solution for 1 to 3 minutes.

(iii) *Technique No. 3—Steel.* This technique or technique No. 1 can be used for post-cleaning the tested steel coupons only.

Description. Use one of the following two solutions:

Solution No. 1. Add 100 ml of sulfuric acid (specific gravity 1.84), 1.5 ml organic inhibitor, and water to make a 1 liter solution. The solution shall be 50°C (120°F). Dip the coupons in this solution.

Solution No. 2 (also referred to as Clarke's solution). Add 20 g of antimony trioxide and 50 g of stannous chloride to 1 liter of hydrochloric acid (specific gravity 1.19). The solution shall be stirred and be used at room

[1] These practices are the recommended practices in "ASTM G1—Standard Recommended Practice for Preparing, Cleaning, and Evaluating Corrosion Test Specimen," published by American Society for Testing and Materials, 1916 Race Street, Philadelphia, Pa. 19103.

temperature. Dip the coupons in this solution stirring the solution at a rate such that deformation of the coupons does not occur. This dipping shall last for up to 25 minutes.

(iv) *Technique No. 4—Aluminum.* This technique or technique No. 1 can be used for post-cleaning the tested aluminum coupons only.

Description. Make a 1 liter solution by adding 20 g of chromic acid, and 50 ml of phosphoric acid (specific gravity 1.69), to water. The solution shall be 80°C (176°F). Dip the coupons in this solution for 5—10 minutes. If a film ramains, dip the coupons in nitric acid (specific gravity 1.42) for 1 minute. Repeat the chromic acid dip. Nitric acid alone may be used if there are no deposits.

(7) After cleaning, examine the metal coupons over a 40-W appliance light bulb for perforation.

(c) *Noncorrosiveness.* Noncorrosiveness shall be determined by the absence of any perforations (excluding notches which extend into the coupon 1 mm or less from any edge) on each of the six test coupons when the coupons are observed over a 40-W appliance light bulb.

§ 1209.6 Test procedures for critical radiant flux.

This section provides the test procedure for determining the critical radiant flux of exposed attic floor insulation using a radiant heat energy source.

(a) *Apparatus and description of test procedure.* Test chamber (Figure 3 and 4 and subsection (b) of this section). An air-gas fueled radiant heat energy panel or equivalent panel inclined at 30° above and directed at a horizontally-mounted attic floor insulation specimen. The radiant panel generates a radiant energy flux distribution ranging along the 100-cm length of the test specimen from a nominal maximum of 1.0 W/cm² to a minimum of 0.1 W/cm². The test is initiated by open flame ignition from a pilot burner. The distance burned to flame-out is converted to W/cm² from the flux profile graph (Figure 10) and reported as critical radiant flux, W/cm². Section 1209.8 provides a procedure for calibrating the radiation pyrometer used to standardize the thermal output of the panel.

(b) *Construction and instrumentation of the radiant panel test chamber.* The radiant panel test chamber shall be constructed and instrumented as follows:

(1) The radiant panel test chamber employed for this test shall be located in a draft protected area. The radiant panel test chamber, (Figures 5 and 6) shall consist of an enclosure 140 cm (55 in) long by 50 CM (19½ in) deep by 71 cm (28 in) above the test specimen. The sides, ends, and top shall be of 1.3 cm (½ in) calcium silicate board, such as Mirinite I, 0.74 g/cm³ (46 lb/ft³) nominal density, with a thermal conductivity at 177°C (350°F) of 1.11 cal (g)/hr cm²°C/cm [0.89 Btu/(hr) (ft²) (°F/in)]. One side shall be provided with an approximately 10 cm × 110 cm (4 × 44 inches) draft tight fire resistant glass window so that the entire length of the test specimen may be observed from outside the fire test chamber. On the same side and below the observation window is a door which, when open, allows the specimen platform to be moved out for mounting or removal of test specimens. A draft tight, fire resistant observation window may be installed at the low flux end of the chamber.

(2) The bottom of the test chamber shall consist of a sliding steel platform which has provisions for rigidly securing the test specimen holder in a fixed and level position. The free, or air access, area around the platform shall be in the range of 1935–3225 cm² (300–500 square in). The top of the chamber shall have an exhaust stack with interior dimensions of 10.2 cm (4 in) wide by 38 cm (15 in) deep by 31.8 cm (12.5 in) high at the opposite end of the chamber from the radiant energy source. The radiant heat energy source shall be a panel of porous refractory material mounted in a cast iron frame, with a radiation surface of 30.5 × 45.7 cm (12 by 18 in). The panel fuel system shall consist of a venturi-type aspirator or equivalent system for mixing gas and air at approximately atmospheric pressure, a clean dry air supply capable of providing 28.3 NTP (Normal Temperature and Pressure) m³ per hr (1000 standard cubic feet per hour) at 7.6 cm (3.0 in) of water, and suitable instrumentation for monitoring and controlling the flow of fuel to the panel.

(3) The radiant heat energy panel shall be mounted in the chamber at 30° to the horizontal specimen plane. The horizontal distance from the 0 mark on the specimen fixture to the bottom edge (projected) of the radiating surface of the panel is 8.9 cm (3½ in). The panel to specimen vertical distance is 14.0 cm (5½ in) (see Figure 5). The angle and dimensions given above are critical in order to obtain the required radiant flux. The radiation pyrometer for standardizing the thermal output of the panel shall be suitable for viewing a circular area 25.0 cm (10 in) in diameter at a range of about 1.37 m (54 in). It shall be calibrated over the black body temperature range of 490–510°C (914–950°F) in accordance with the procedure described in Section 1209.8. A high impedance voltmeter with a suitable millivolt range shall be used to monitor the output of the radiation pyrometer described. The dummy holder (see Figure 7), shall be constructed from heat-resistant stainless steel (AISI Type 300 (UNA-N08330)) or equivalent, thickness 0.198 cm (0.078 in), having overall dimension of 114 cm (45 in) by 32 cm (12¾ in) with a specimen opening of 20 cm (7.9 inches) by 100 cm (39.4 in). Six slots are cut in the flange on either side of the holder to reduce warping. The holder is fastened to the platform with two stud bolts at each end.

(4) The specimen tray (see Figure 8) shall be constructed from heat-resistant stainless steel (AISI Type 300 (UNA-N08330)) or equivalent, thickness 0.198 cm (0.078 in), having overall dimensions of 110 cm (43.3 in) by 27.3 cm (10.8). The depth of the tray is 5.0 cm (2 in). The flanges of the specimen tray are drilled to accommodate two stud bolts at each end; the bottom surface of the flange is 2.1 cm (0.83 in) below the top edge of the specimen tray.

(5) The pilot burner, used to ignite the specimen shall be a propane venturi torch with an axially symmetric burner tip having a propane supply tube with an orifice diameter of 0.0076 cm (0.003 in). In operation, the propane flow is adjusted to give a pencil flame blue inner cone length of 1.3 cm (½ in). The pilot burner is positioned so that the flame generated will impinge on the centerline of the specimen at the 0 distance burned point and at right angles to the specimen length (see Figures 5 and 6). The burner shall be capable of being swung out of the ignition position so that the flame is horizontal and at least 5 cm (2 in) above the specimen plane.

(6) Two 3.2 mm (⅛ in) diameter stainless steel sheathed, grounded junction chromel alumel thermocouples are located in the flooring radiant panel test chamber (see Figures 5 and 6). Thermocouples shall be kept clean to ensure accuracy of readout. The chamber thermocouple is located in the longitudinal central vertical plane of the chamber 2.5 cm (1 in) down from the top and 10.2 cm (4 in) back from the inside of the exhaust stack. The exhaust stack thermocouple is centrally located 15.2 cm (6 in) from the top. A temperature indicating device with a range of 100–500°C (212–932°F) may be used to determine the chamber temperatures prior to a test.

(7) An exhaust duct with a capacity of 28.3–85 NTP m³ per minute (1000–3000 standard cubic feet per minute) decoupled from the chamber stack by at least 7.6 cm (3 in) on all sides and with an effective area of the canopy slightly larger than the plane area of the chamber with the specimen platform in the out position shall be used to remove combustion products from the chamber. With the panel turned on and dummy specimen in place,

there shall be no measurable difference in air flow through the chamber stack with the exhaust on or off.

(8) The dummy specimen which is used in the flux profile determination shall be made on 1.9 cm (¾ in) 0.74 g/cm³ (46 lb/ft³) nominal density calcium silicate board, such as Marinite I (see Figure 7). It is 25 cm (10 in) wide by 107 cm (42 in) long with 2.7 cm (1 1/16 in) diameter holes centered on and along the centerline at the 10, 20, 30, 40, 50, 60, 70, 80, 90 cm locations, measured from the maximum flux end of the specimen. The total heat flux transducer used to determine the flux profile of the chamber in conjunction with the dummy specimen should be of the Schmidt-Boelter type, having a range of 0–1.5 W/cm² (0–1.32 Btu/ft² s), and shall be calibrated over the operating flux level range of 0.10 to 1.5 W/cm² in accordance with the procedure outlined in Section 1209.8. The incoming cooling water flowing through the instrument shall be 15–25°C (59–77°F). A high impedance voltmeter with a resolution of at least 0.01 mV shall be used to measure the output of the total heat flux transducer during the flux profile determination. A timer shall be used for measuring preheat and pilot contact time.

(c) *Safety procedures.* The possibility of a gas-air fuel explosion in the test chamber should be recognized. Suitable safeguards consistent with sound engineering practice should be installed in the panel fuel supply system. These may include one or more of the following: (1) a gas feed cut-off activated when the air supply fails, (2) a fire sensor directed at the panel surface that stops fuel flow when the panel flame goes out, (3) a commercial gas water heater or gas-fired furnace pilot burner control thermostatic shut-off, which is activated when the gas supply fails, or other suitable and approved device. Manual reset is considered a desirable feature of any safeguard system used. In view of the potential hazard from products of combustion, the exhaust system must be so designed and operated that the laboratory environment is protected from smoke and gas. The operator should be instructed to minimize exposure to combustion products by following sound safety practices, such as ensuring that the exhaust system is working properly and wearing appropriate clothing, including gloves.

(d) *Test specimens*—(1) *Specimens of insulation intended for pneumatic applications.* Test specimens intended for pnuematic applications shall be blown into the tray. The tray shall be filled by blowing the insulation through a commercial blower using 30.48 m (100 ft) of nominal 2 inch flexible blower hose. (The Commission staff has found that a Breuer Electrical Manufacturing Company Blower, Model 98805, is suitable for blowing, although other blowers may also be suitable.) The tray shall be locate at the same level as the blowing machine on a level floor. When blowing, the hose shall be pointed 10 ± 1 degrees upward. The bottom end of the hose orifice shall be 17.7 cm (7 in) above the floor surface. When the insulation is blowing at a steady rate, start filling the tray so that the main stream of the material is falling over the rear wall; slowly move backward maintaining the height and direction of the hose as specified. Continue filling the tray at an even rate until the material falls over the front wall of the tray. Screed the insulation to the top of the tray, taking care not to compact the insulation or leave large voids in the surface of the material.

(2) *Specimens of insulation intended for pouring applications.* Insulation intended for pouring applications shall be poured into the tray until the tray is overfilled and then carefully screeded to the top of the tray taking care not to compact the insulation or leave large voids in the surface of the material.

(3) *Specimens of insulation intended for pouring and pneumatic applications.* If the insulation is intended for both pouring and pneumatic applications, or if it is uncertain whether the insulation will be poured or blown, the insulation shall be tested using the test procedures at § 1209.6(d) (1) and (2) for each of the applications. Three specimens shall be tested under the test procedure for each application. All of the specimens shall meet the criteria at § 1209.3(b) for passing the attic floor radiant panel test.

(e) *Radiant heat energy flux profile standardization.* In a continuing program of tests, determine the flux profile at least once a week. Where the time interval between tests is greater than one week, determine the flux profile at the start of the test series.

(1) Mount the dummy specimen in the mounting frame and attach the assembly to the sliding platform. With the sliding platform out of the chamber, ignite the radiant panel. Allow the unit to heat for 1 hour. The pilot burner is off during this determination. Adjust the fuel mixture to give an air-rich flame. Make fuel flow settings to bring the panel to an apparent black body temperature as measured by the radiation pyrometer, of approximately 500°C (932°F), and bring the chamber to a temperature of approximately 180°C (356°F). When equilibrium has been established, move the specimen platform into the chamber. Allow 0.5 hour for the closed chamber to reach equilibrium.

(2) Measure the radiant heat energy flux level at the 40 cm point with the total flux meter instrumentation. This is done by inserting the flux meter in the opening so that its detecting plane is 0.16–0.32 cm (1/16–⅛ inch) above and parallel to the plane of the dummy specimen and reading its output after 30±10 seconds. If the level is within the limits specified, the flux profile determination is started. If it is not, make the necessary adjustments in the panel fuel flow. A suggested flux profile data log format is shown in Figure 11.

(3) The test shall be run under chamber operating conditions which give a flux profile as shown in Figure 10. The radiant heat energy incident on the dummy specimen shall be between 0.87 and 0.95 W/cm² (0.77 and 0.83 Btu/ft² sec) at the 20 cm point, between 0.48 and 0.52 W/cm² (0.42 and 0.46 Btu/ft² sec) at the 40 cm point, and between 0.22 and 0.26 W/cm² (0.19 and 0.23 Btu/ft² sec) at the 60 cm point. Insert the flux meter in the 10 cm opening, following the procedure given above. Read the millivolt output at 30±10 seconds and proceed to the 20 cm point. Repeat the 10 cm procedure. The 30 to 90 cm flux levels are determined in the same manner. Following the 90 cm measurement, make a check reading at 40 cm. If this is within the limits set forth, the test chamber is in calibration, and the profile determination is completed. If not, carefully adjust fuel flow, allow 0.5 hour for equilibrium and repeat the procedure. Plot the radiant heat energy flux data as a function of distance along the specimen plane on rectangular coordinate graph paper. Carefully draw the best smooth curve through the data points. This curve will hereafter be referred to as the flux profile curve.

(4) Determine the open chamber apparent black body and chamber temperatures that are identified with the standard flux profile by opening the door and moving the specimen platform out. Allow 0.5 hour for the chamber to reach equilibrium. Read the radiation pyrometer output and record the apparent black body temperature. This is the temperature setting that can be used in subsequent test work in lieu of measuring the radiant flux at 20 cm, 40 cm, and 60 cm using the dummy specimen. The chamber temperature also shall be determined again after 0.5 hour and is an added check on operating conditions.

(f) *Conditioning.* Test specimens shall be conditioned to equilibrium at 21±3°C (69.8±5.4°F) and a relative humidity of 50±5 percent immediately prior to testing. A less than 1% change in net weight of the specimen in two consecutive weighings with two hours between each weighing constitutes equilibrium.

(g) *Test Procedure.* (1) With the sliding platform out of the chamber, ignite the radiant panel. Allow the unit to heat for 1 hour. It is recommended that a sheet of inorganic millboard be used to cover the opening when the hinged portion of the front panel is open and the specimen platform is moved out of the chamber. The millboard is used to prevent heating of the specimen and to protect the operator. Read the panel apparent black body temperature and the chamber temperature. If these temperatures are in agreement to within ±5°C (±9°F) with those determined previously, during the flux profile standardization procedure, the chamber is ready for use.

(2) Mount the specimen tray with insulation on the sliding platform and position with stud bolts (see Figure 9). Ignite the pilot burner, move the specimen into the chamber, and close the door. Start the timer. After 2 minutes preheat, with the pilot burner on and set so that the flame is horizontal and 5 cm above the specimen, bring the pilot burner flame into contact with the center of the specimen at the 0 mark. Leave the pilot burner flame in contact with the specimen for 2 minutes, or until all flaming other than in the area of the pilot burner has ceased, then remove to a position of at least 5 cm above the specimen and leave burning until the test is terminated.

(3) If the specimen does not ignite within 2 minutes following pilot burner flame application, the test is terminated by extinguishing the pilot burner flame. For specimens that do ignite, the test is continued until the flame goes out. When the test is completed, the door is opened, and the specimen platform is pulled out.

(4) Measure the distance burned, (the point of farthest advance of the flame front) to the nearest 0.1 cm (.03 in). From the flux profile curve, convert the distance to W/cm² (Btu/ft² sec) critical radiant heat flux at flame out. Read to two significant figures. A suggested data log format is shown in Figure 12.

(5) Remove the specimen tray from the moveable platform. The succeeding test can begin as soon as the panel apparent black body temperature and chamber temperature are verified. The specimen tray should be at room temperature before the next specimen is inserted.

§ 1209.7 Test procedures for smoldering combustion.

This section provides the test method for determining smoldering combustion characteristics of materials used for thermal insulation. This test shall be conducted on materials at the measured settled density as provided in § 1209.4.

(a) *Apparatus.* (1) The specimen holder shall be an open-top 20±0.2 cm (7.87±.08 in) square box, 10±0.2 cm (3.94±.08 in) in height, fabricated from a single piece of 0.61±0.08 mm thick (24 U.S. Standard gauge) stainless steel sheet with the vertical edges of the box overlapped, not to exceed 7 mm (.28 in) in seam width, and soldered so as to be watertight. The specimen holder during test use shall rest upon a pad of unfaced glass fiberboard or equivalent having dimensions equal to or greater than those of the bottom of the specimen holder. The unfaced glass fiberboard shall be approximately 2.5 cm (1 in) thick with a thermal conductivity of 0.30±0.05 cal(g)/hr cm² °C/cm (0.24±0.04 Btu/hr ft² °F/in) at 23.9°C (75°F).

(2) *Ignition source.* The ignition source shall be a cigarette without filter tip made from natural tobacco, 85±2 mm (3.35±.08 in) long with a tobacco packing density of 0.270±0.020 g/cm³ (16.9±1.25 lb/ft³) and a total weight of 1.1±0.1 gm (0.039±0.004 oz).

(3) *Balance.* A balance of 1 kg (2.2 lb) capacity, accurate at least to 0.1 g (0.004 oz), is required.

(4) *Test area.* The test area shall be draft-protected and equipped with a suitable system for exhausting smoke and/or noxious gases produced by testing. Air velocities as measured by a hot wire anemometer in the vicinity of the surface of the specimen shall not exceed 0.5 m/sec (1.64 ft/sec). The test area shall be at 21±3°C (69.8±5.4°F) and 50±5 percent relative humidity at the time the test begins.

(b) *Test procedure.* (1) Specimens and cigarettes shall be conditioned in air at a temperature of 21±3°C (69.8±5.4°F) and a relative humidity of 50±5 percent to equilibrium prior to test. A change of less than 1% in net weight of the specimen in two consecutive weighings with two hours between each weighing constitutes equilibrium. Cigarettes shall be removed from any packaging and exposed in a suitable manner to permit free movement of air around them during conditioning. Calculate the weight of material necessary to fill the holder (volume 4,000 cm³ or 0.14 ft³) at the settled density as determined in 1209.4(e). The material shall be blown, combed, or otherwise mixed to remove lumps and shall be loaded uniformly into each specimen holder, level and flush to the top of the holder. The weight of each speciment shall be measured to the nearest 0.2 g (0.007 oz) or less by weighing the holder before and after filling. If the weight of the specimen is less than that calculated, the loaded holder shall be dropped from a height no greater than 7.6 cm. (3 in) onto a hard flat surface and additional material added up to the top edge of the holder. This process shall be repeated until the calculated weight of material has been added and completely fills the holder. With the specimen in the holder and placed on the insulated pad, a rod of 8 mm (.31 in) diameter with a pointed end shall be inserted vertically into the approximate center of the material being tested and withdraw to form an appropriate cavity for the ignition source, such that the cigarette fits snugly and maintains uniform contact with the specimen. A well lit cigarette, burned not more than 8 mm (0.31 in), shall be inserted in the formed cavity, with the lit end upward and flush with the specimen surface. Burning of the cigarette and specimen shall be allowed to proceed undisturbed in the test area for at least 2 hours or until the smoldering is no longer progressing, whichever period is longer.

(2) After completion of burning and after the holder has cooled down to approximately room temperature, the specimen holder with its material residue shall be weighed, at least to the nearest 0.1 g (0.003 oz), and the percent weight loss of the original specimen calculated. The weight of the cigarette residue is ignored in this calculation. (That is, the weight of the cigarette residue is not subtracted from the net weight of the specimen holder's contents at the conclusion of the test.)

(3) Three specimens per sample shall be tested.

§ 1209.8 Procedure for calibration of radiation instrumentation.

This procedure is used to calibrate the radiation instruments used in the test procedures for measuring critical radiant flux.

(a) *Radiation pyrometer.* Calibrate the radiation pyrometer by means of a conventional black body enclosure placed within a furnace and maintained at uniform temperatures of 490, 500, and 510°C (914, 932, and 950°F). The black body enclosure may consist of a closed chromel metal cylinder with a small sight hole in one end. Sight the radiation pyrometer upon the opposite end of the cylinder where a thermocouple indicates the black body temperature. Place the thermocouple within a drilled hole and in good thermal contact with the black body. When the black body enclosure has reach the appropriate temperature equilibrium, read the output of the radiation pyrometer. Repeat for each temperature.

(b) *Total heat flux meter.* The total flux meter shall be calibrated by the National Bureau of Standards, (direct request for such calibration services to the: Radiometric Physics Division, 534, National Bureau of Standards (NBS),

Washington, DC 20234.), or alternatively, its calibration shall be developed by transfer calibration methods with an NBS calibrated flux meter. This latter calibration shall make use of the radiant panel tester as the heat source. Measurements shall be made at each of the nine dummy specimen positions and the mean value of these results shall constitute the final calibration.

(c) *Recommendation.* It is recommended that each laboratory maintain a dedicated calibrated reference flux meter against which one or more working flux meters can be compared as needed. The working flux meters should be calibrated according to this procedure at least once per year.

§ 1209.9 Labeling requirement.

(a) Manufacturers and private labelers of cellulose insulation shall place on all containers of cellulose insulation the following statement: "This product meets the amended CPSC standard (effective October 16, 1979) for flame resistance and corrosiveness of cellulose insualtion."

To meet this requirement manufacturers and private labelers may use any type of label, including one which is pressure sensitive or glued on, provided the label is made in such a manner that it will remain attached to the container for the expected time interval between the manufacture of the product and its installation.

(b) This label shall appear prominently and conspicuously on the container in letters which are at least one-fourth inch in height. The labeling statement shall be printed with legible type in a color which contrasts with the background on the which the statement is printed.

§ 1209.10 Certification and enforcement.

(a) While this Part 1209 prescribes test methods to determine whether cellulose insulation subject to this interim standard meets its requirements, the interim standard itself does not require that a manufacturer or private labeler test any cellulose insulation. However, section 14 of the Consumer Product Safety Act (15 U.S.C. 2063) requires manufacturers and private labelers of products subject to safety standards to certify that the product conforms to the standard based on either a test of each product or a reasonable testing program. (Elsewhere in this issue of the FEDERAL REGISTER the Commission has proposed a certification rule that would prescribe requirements that manufacturers and private labelers would have to follow to certify that their cellulose insulation complies with the requirements of the amended standard.)

(b) The Commission intends to use the test procedures set forth in this Part 1209 to determine whether insulation subject to the interim standard meets the requirements of the interim standard.

§ 1209.11 Effective date.

All cellulose insulation that is a consumer product and that is manufactured after October 15, 1979 shall meet the requirements of this standard, including the labeling requirement of § 1209.9.

PROCEDURE FOR SUBMITTING COMMENTS

Comments regarding this proposal for amending the interim standard must be received by April 9, 1979. Comments should be accompanied, to the extent possible, by supporting data or documentation. Requests for confidentiality of documentation will be handled in accordance with the Freedom of Information Act as amended (5 U.S.C. 552) the Commission's regulations under that act (16 CFR Part 1015, February 22, 1977) and the provisions of section 6(a)(2) of the CPSA (15 U.S.C. 2055(a)(2)).

Written submissions and any accompanying data or material should be submitted, preferably in five copies, addressed to the Secretary, Consumer Product Safety Commission, Washington, D.C. 20207.

All written comments that are received, and all other material which the Commission has that is relevant to this proceeding may be seen in, or copies obtained from, the Office of the Secretary, Third Floor, 1111 18th Street, NW., Washington, D.C. 20207.

(Sec. 35(c)(2), Pub. L. 95-319, 92 Stat. 388-389 (15 U.S.C. 2082).

Dated: March 2, 1979.

SADYE E. DUNN,
Secretary, Consumer Product Safety Commission.

[6355-01-C]

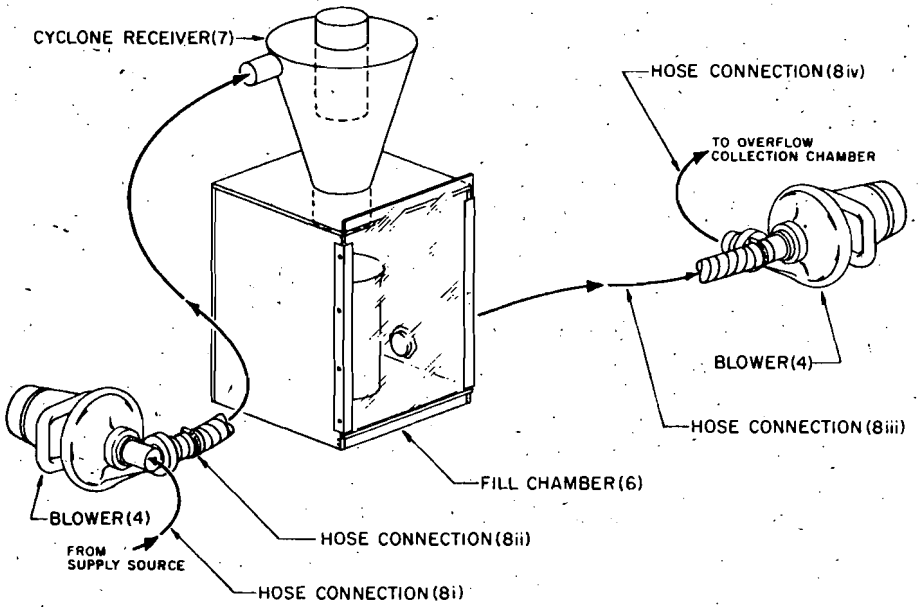


FIG 1—PARTIAL INSULATION PREPARATION APPARATUS

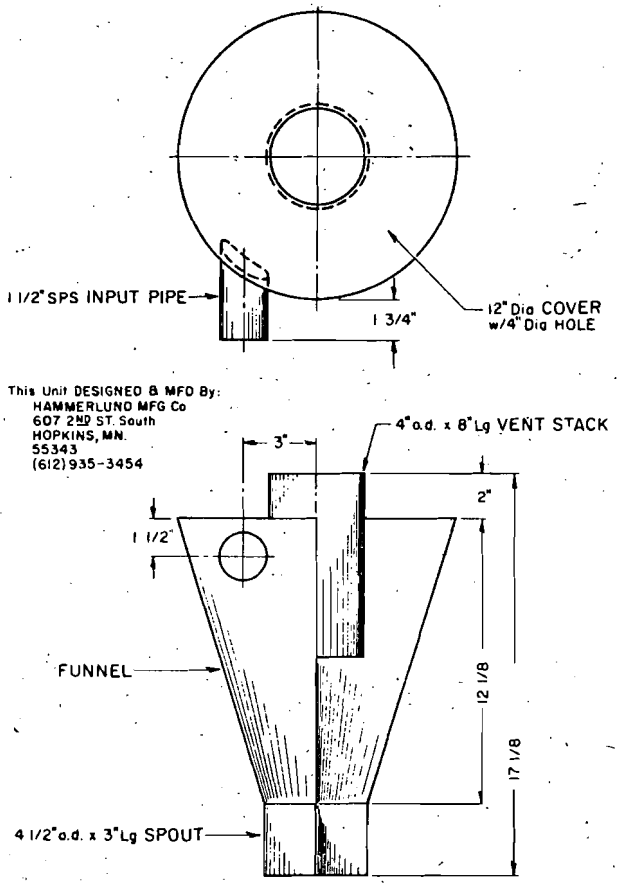
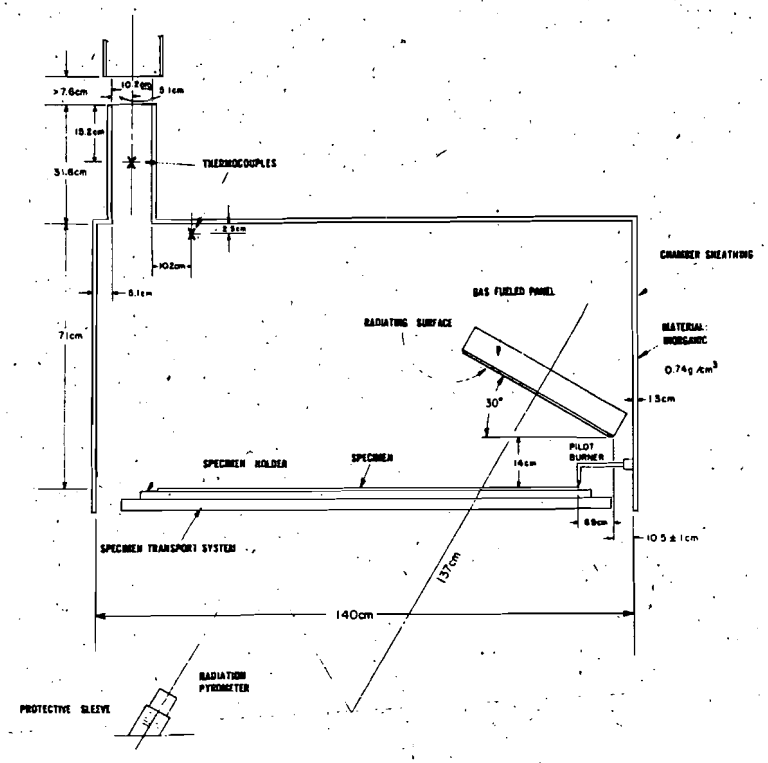


FIG 2—CYCLONE RECEIVER WELDMENT



FLOORING RADIANT PANEL TESTER SCHEMATIC
SIDE ELEVATION

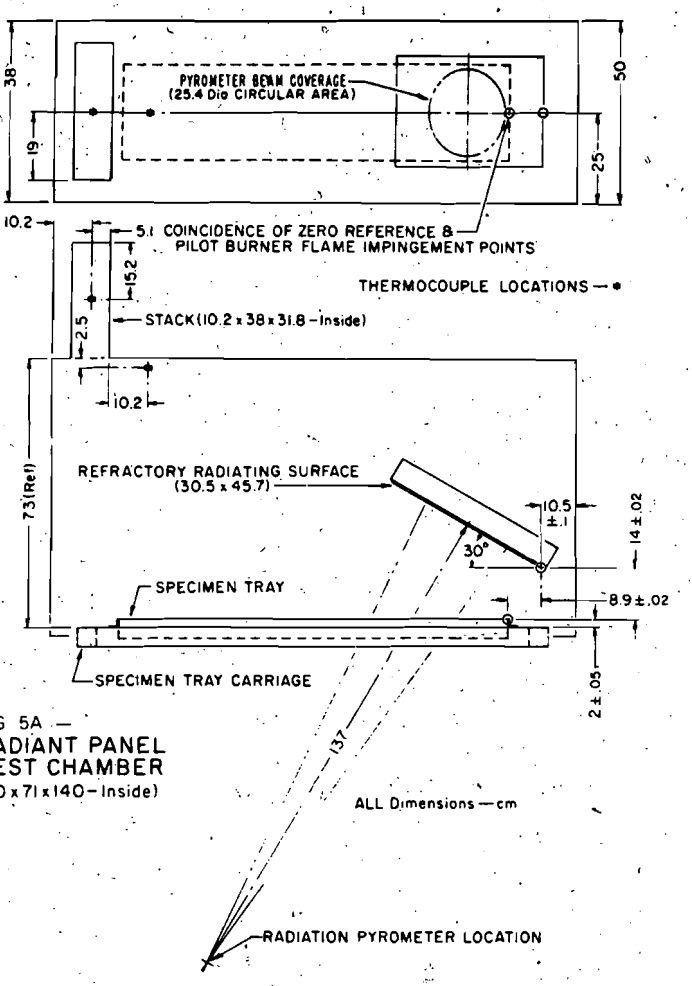


FIG 5A —
RADIANT PANEL
TEST CHAMBER
(50 x 71 x 140 - Inside)

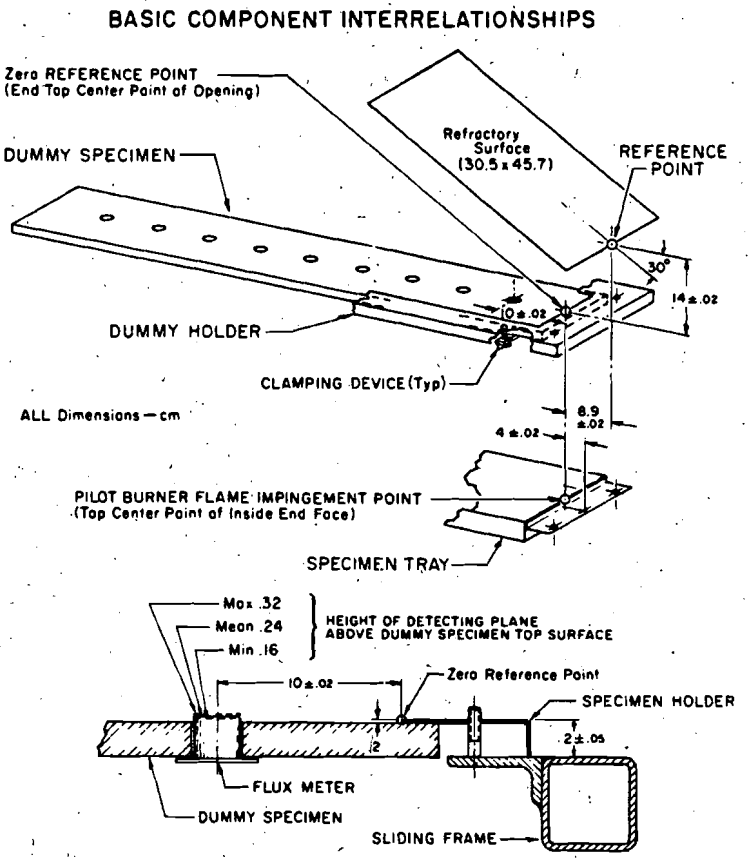


FIG 5B — ZERO REFERENCE POINT
RELATED TO DETECTING PLANE

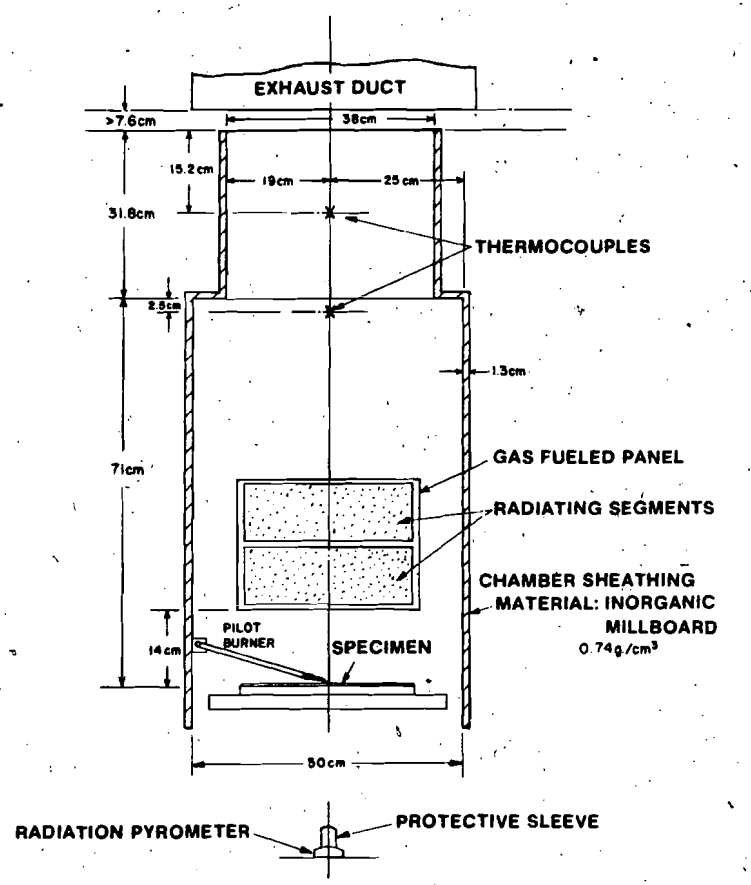


FIG 6 — FLOORING RADIANT PANEL TESTER SCHEMATIC
LOW FLUX END, ELEVATION.

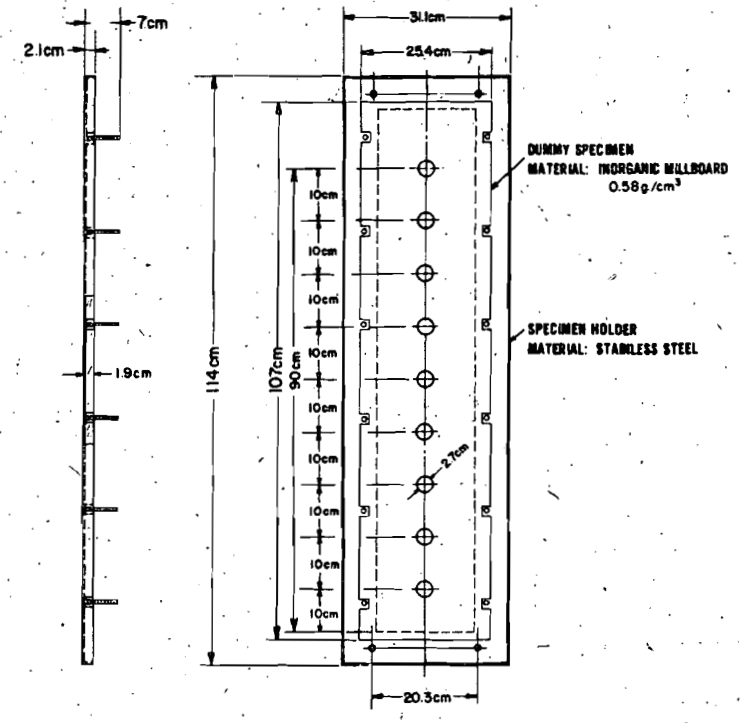
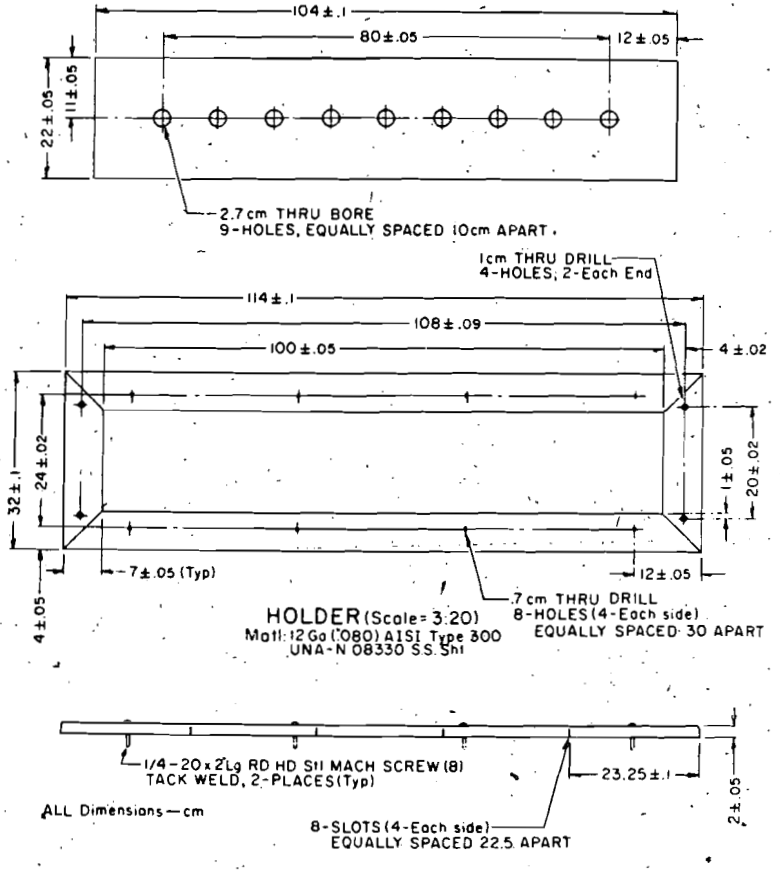


FIG 7— DUMMY SPECIMEN IN SPECIMEN HOLDER

FIG 7A —
DUMMY SPECIMEN (Scale= 3:20) Matl: 0.74 gm/cm INORGANIC MILLBOARD ~1.9 cm (3/4") THK



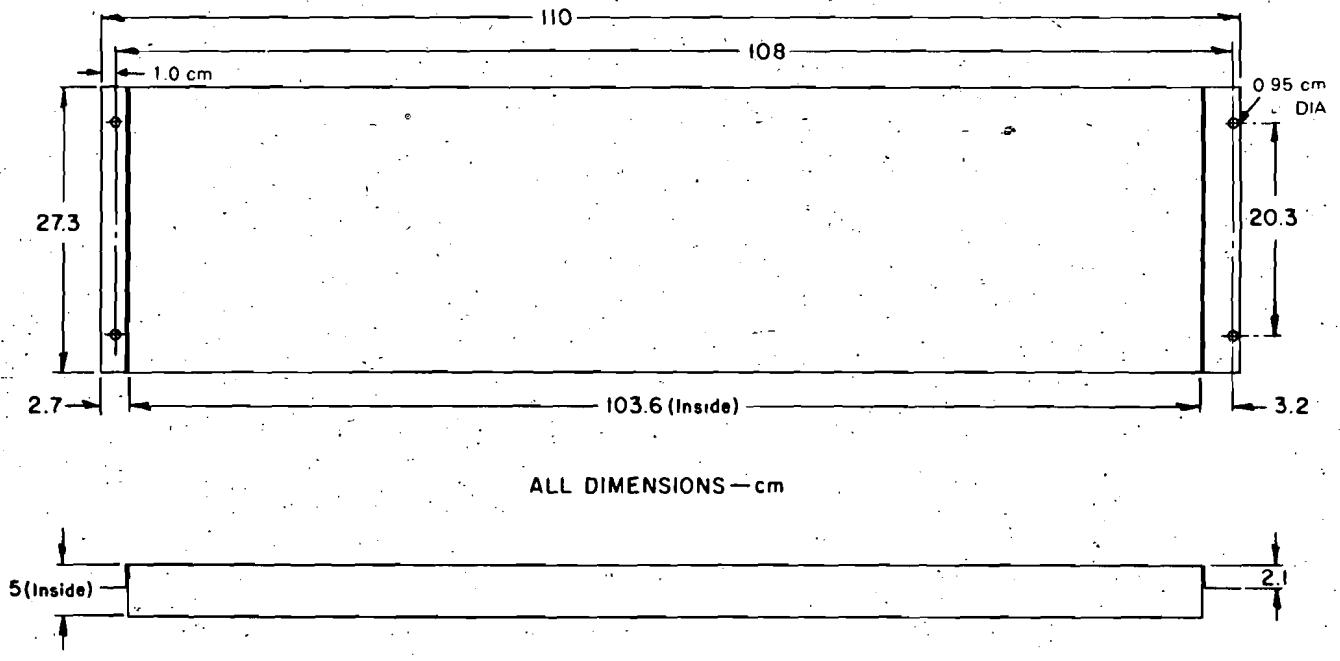
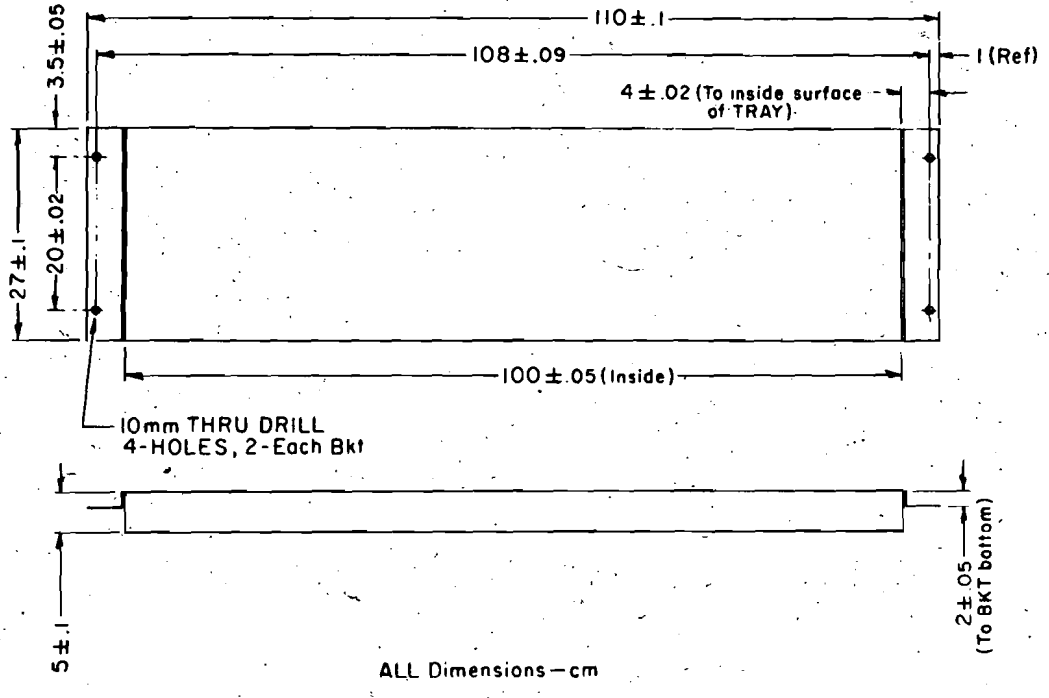


FIG 8—SPECIMEN TRAY

FIG 8A—
SPECIMEN TRAY (Scale = 3:20) Matl: See HOLDER Specs



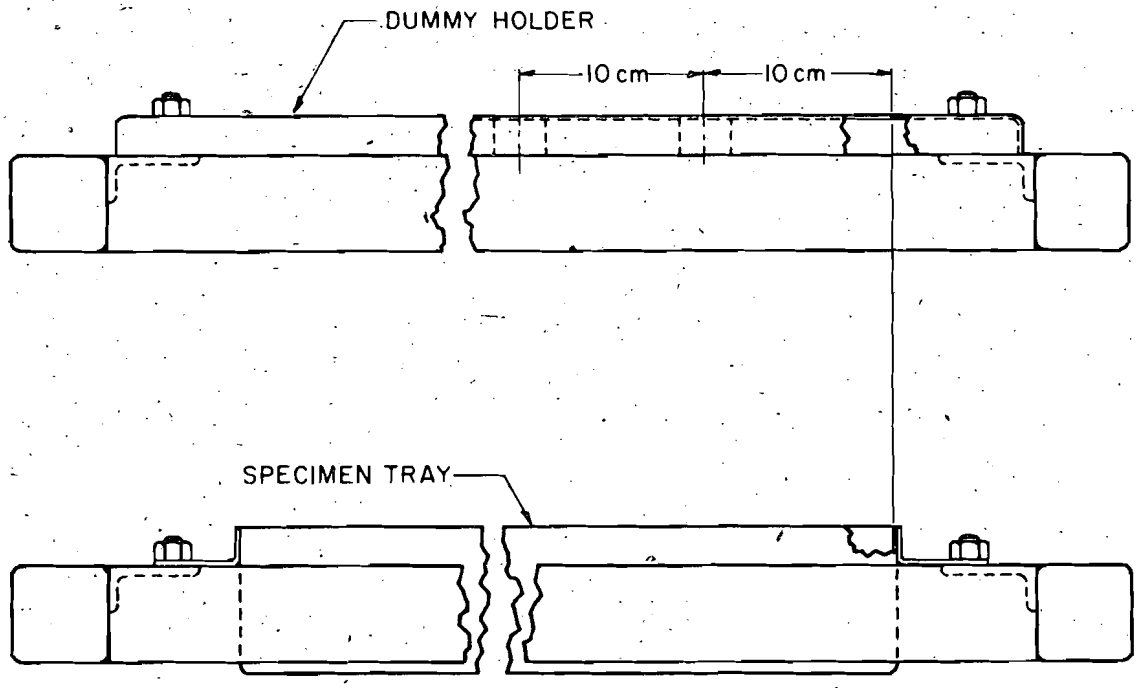


FIG 9 — SPECIMEN TRAY MOUNTING POSITION

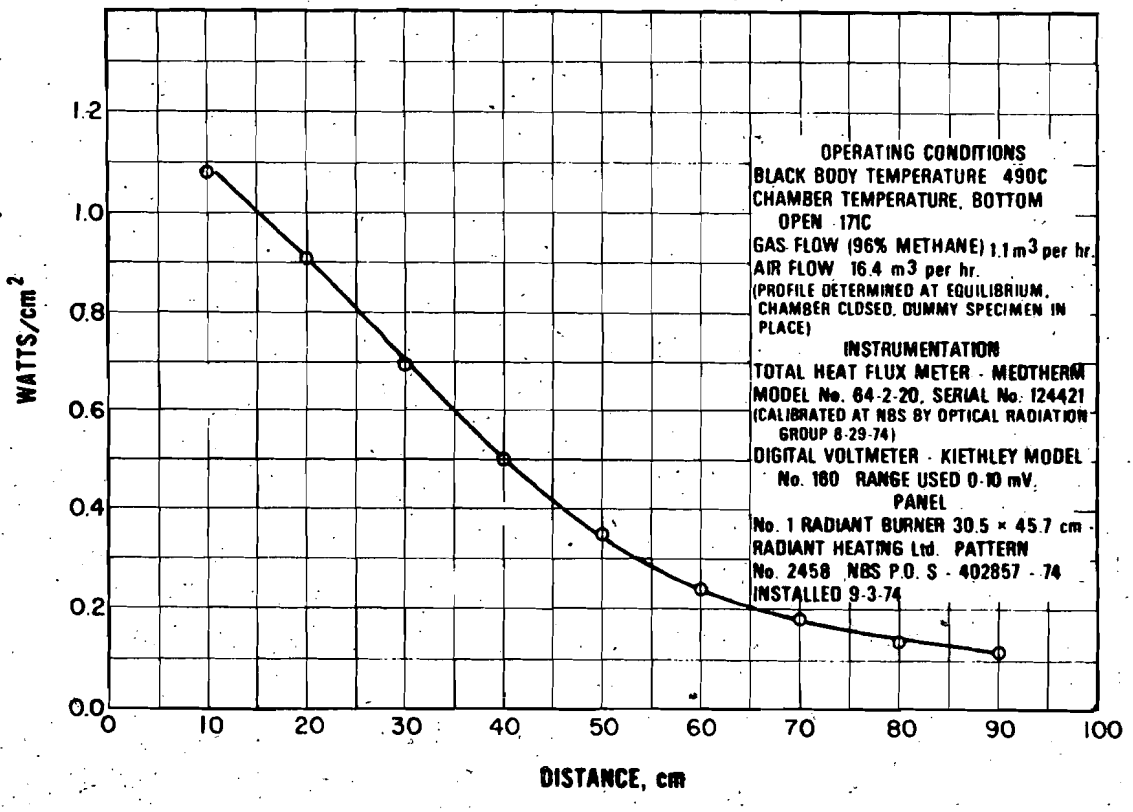


FIG 10 — **STANDARD RADIANT HEAT ENERGY FLUX PROFILE**

[6355-01-M]

RADIANT FLUX PROFILE

Date———————
Black Body Temperature —— m.v. —— °C (°F.)
Gas Flow —— NTPm³H (SCFH) Air Flow —— NTPm³H (SCFH)
Room Temperature —— °C (°F)
Air Pressure —— Gas —— cm (in) of H_2O
Flux Meter ——— Conversion Factor ——
Radiometer No. —— from Calibration on ——

Distance (cm)	MV	Watts/cm²
10	_____	_____
20	_____	_____
30	_____	_____
40	_____	_____
50	_____	_____
60	_____	_____
70	_____	_____
80	_____	_____
90	_____	_____

Signed _____

FIG. 11 FLUX PROFILE DATA LOG FORMAT

Test Number —— Date —— Time ——
Laboratory ———————
Specimen Identification/Code No. ——
Test Assembly: ———
Panel: Angle —— ° Temperature —— °C (°F)
Flow: Gas —— NTPm³H (SCFH) Air —— NTPm³H
Pressure, cm (in) H_2O: Initial, Air —— Gas ——
Chamber Temperature (Initial) —— °C (°F)
Room: Temperature —— °C (°F) Hood Draft —— cm (in) water
Flame Front Out —— min.
All Flame Out —— min.
Total Burn Length —— cm (in)
Critical Radiant Flux watts/cm² ———
Flux Profile Reference ———
Observations:
Signed ———————

FIG. 12 INSULATION RADIANT PANEL TEST DATA LOG FORMAT

[FR Doc. 79-6863 Filed 3-7-79; 8:45 am]