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 and measurements.

(a) As used in this part 1209, *Cellulose insulation* means cellulosic fiber, loose fill, thermal insulation that is suitable for blowing or pouring applications.

(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 3 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 at § 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 specimens, 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 lose fill insulation must be determined before the corrosiveness test (§ 1209.5) and the smoldering combustion test (§ 1209.7) can be performed. This section describes the procedure for determining the settled density of loose fill insulation.

(a) *Apparatus and materials.* (1) An insulation specimen container with a flat bottom and an inside diameter of 15.0±1 cm, straight sides [without a flared lip or spout, (Apparatus #1)]. The height of the beaker shall be such that the distance between the bottom of the cyclone and the top edge of the beaker is 8.5 cm±1.0 cm. (3.39 in±.39 in).

(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 4.5 kg (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 1.17 cm ($\frac{15}{32}\pm\frac{1}{32}$ in.) ±.08 cm 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 with inside dimensions of 45.7 cm (18 in) high × 38.1 cm (15 in) wide × 38.1 cm (15 in) deep, with covered openings that will allow a radiant panel tray to be slid through the chamber, (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 container 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 between 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 for settled density 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 × 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), applyilng 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 test shall be conducted in an area conditioned to the requirements of § 1209.4(b).

(ii) 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 container (Apparatus #10). Connect one end of the cyclone receiver hose (Apparatus #8.ii) 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). The fill chamber shall be placed on a flat and level surface. 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.

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

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

(v) 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.

(vi) Turn on the blowers simultaneously and proceed to fill the insulation specimen container by picking up material from the holding container using the supply source hose.

(vii) 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.

(viii) 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.

(ix) 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.

(x) Cover the container to prevent spilling and secure the container to the shaker. Operate the shaker for a period of 5 minutes±15 seconds.

(xi) Remove the container from the shaker and uncover, taking care not to bump or jar it. Lower the disc (Apparatus #2) 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.

(xii) 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.

(xiii) 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 (vi) through (xii) 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 for settled density 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 0.076 mm (0.003 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 20g (0.7 oz).

(b) *Procedure*—(1) *General procedures for cleaning all metal coupons.* The metal coupons shall be cleaned by the following method:

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

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

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

(iv) Water shall be distilled or deionized water.

(v) Handle cleaned coupons only with clean forceps.

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

(vii) Clean the coupons by vapor degreasing with 1,1,1-trichloroethane for ten minutes. Following vapor degreasing, subject the coupons to caustic and/or detergent washing as appropriate. Following caustic or detergent washing, rinse the coupons in flowing water to remove residues. Inspect each coupon for a water-break free surface. (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.) Hot air dry the coupons at 105 °C (221 °F).

(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 (0.35 oz) portions. The quantity of distilled or deionized water to be used for each 10g (0.35 oz) portion shall be determined using the following formula:

ml distilled water = 46 / (settled density, Kg/m^3) × 75