



# OFFICIAL METHOD

## Determination of Flame Projection

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**Health Products and Food Branch**

## I. APPLICATION

This method shall be used to determine the flame projection as described in Section A.01.062 of a food or drug packaged as described in Section A.01.061 of the *Food and Drug Regulations* and the flame projection as described in Section 26 of a cosmetic packaged as described in Section 25 of the *Cosmetic Regulations*.

## II. SAMPLING

Obtain three containers of the same size and lot number of the product to be tested.

## III. APPARATUS

- (1) Flammability tester meeting the following requirements:
  - a) A device to secure the container in place such that the discharge is in the horizontal plane (Note 1);
  - b) A device by which the valve of the container can be actuated by remote control (Note 2);
  - c) A vertically-mounted burner to provide a flame source consisting of a metal tube with an inside diameter of 1.2 mm connected by metal tubing to an n-butane gas cylinder (Note 3). The burner is placed at a distance of 15 cm from the discharge orifice of the container measured horizontally between the vertical planes of the discharge orifice and the burner orifice;
  - d) Two vertically adjustable support frameworks with an internal open space 35 cm wide x 45 cm high, constructed from metal or other non-flammable material. The frameworks shall be mounted in a vertical plane perpendicular to the direction of discharge from the aerosol container at distances of 15 and 45 cm from the burner on the opposite side of the burner to the container (Note 4);
- (2) A n-butane gas cylinder (C.P. grade) fitted with a regulator capable of maintaining the flame heights required;
- (3) Cheesecloth complying with the requirements of CGSB Standard 4-GP-81M for Type 2 material.

#### IV. PROCEDURE

- (1) Perform all tests at  $22 \pm 2^\circ\text{C}$  in the absence of air currents with allowance made for a clearance of 50 cm beyond the framework set at 45 cm from the burner. It has been found satisfactory to conduct the test in a fume hood with the exhaust fan turned off and the protecting door lowered. Adequate fire extinguishing equipment should be available. The fumes should be exhausted and the residues cleaned up after each discharge;
- (2) Equilibrate the containers to  $22 \pm 2^\circ\text{C}$  and release a five second discharge (Note 5) from each container prior to testing to ensure proper operation of the valve;
- (3) Install the container in the holder and ensure that the burner orifice is 15 cm from the discharge orifice of the container in the horizontal plane, and 5 cm below it in the vertical plane, and that the discharge orifice is aimed as directly as possible at the burner;
- (4) Adjust the burner to give a 5 cm flame height and discharge the container for a period of five seconds. If flame projection occurs, proceed to step (5). If flame projection does not occur, lower the burner so that the orifice is 10 cm below the discharge orifice of the container and adjust the burner to give a flame height of 12 cm;
- (5) Install the cheesecloth to cover the entire internal space of the support frame work at 15 cm (Note 6) and verify that the cheesecloth is at the proper horizontal distance from the vertical plane of the burner orifice, on the opposite side of the burner from the container. Adjust the height of the framework so that the cheesecloth will intercept the line of flame projection from the container;
- (6) Where a manufacturer recommends shaking or agitating before use, remove the container from the holder, shake vigorously for five seconds, replace the container in the holder and discharge, within fifteen seconds of the cessation of shaking.
- (7) Where the manufacturer has not recommended shaking and agitating before use, test each container as described in steps (8) and (9) first without and subsequently with shaking as described in step (6) (Note 7).
- (8) Discharge the container for a period of five seconds (Note 5) or until the cheesecloth ignites. If no ignition occurs, repeat the test on the container two additional times.
- (9) If ignition of the cheesecloth occurred with the initial discharge in step (8) carry out two subsequent discharges with the cheesecloth attached to the framework at 45 cm from the burner.
- (10) Record any ignition of the cheesecloth and any flame projection.

## V. INTERPRETATION OF RESULTS

- (1) Where ignition of any of the discharges from the container has occurred which resulted in the flame reaching the container, the sample exhibits flashback.
- (2) Where the cheesecloth mounted at 45 cm is ignited during any of the discharges, the sample has a flame projection of 45 cm or more.
- (3) Where the cheesecloth mounted at 45 cm is not ignited, but the cheesecloth mounted at 15 cm is ignited during any of the discharges, the sample has a flame projection of 15 cm or more, but less than 45 cm.
- (4) Where the cheesecloth mounted at 15 cm is not ignited but there is ignition of any of the discharges, the sample has a flame projection of less than 15 cm.
- (5) Where no ignition of the discharge occurs, the sample does not have a flame projection.

## VI. NOTES

- (1) The holder can be a three-prong clamp, affixed to a ring stand or an equivalent device.
- (2) A bicycle hand brake (caliper type, side pull) has been found to perform well as a remote actuator for the valve.
- (3) A burner made by directly affixing a Luer-Lock sixteen gauge needle to metal tubing has proved acceptable. The burner is adjustable in the vertical and horizontal planes.
- (4) An apparatus such as that illustrated in Figure 1 has been found to be satisfactory.
- (5) Where the container is constructed to deliver a discharge of less than five seconds upon each actuation of the valve, the delivered discharge shall be used to determine the flame projection.
- (6) Bulldog clips have proved satisfactory for attaching the cheesecloth to the support framework.
- (7) Where the size of the container precludes the completion of all the required discharges, additional samples of the same lot sufficient to complete the testing should be obtained.

This method described above, being comprised of 4 pages and Figure I being comprised of one page, and identified as DO-30, DETERMINATION OF FLAME PROJECTION and dated October 15, 1981, is hereby designated the "official method" referred to in Section A.01.062 of the *Food and Drug Regulations* and Section 26 of the *Cosmetic Regulations*.

FIGURE 1

