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## 1 SCOPE


- 1.1 This test is to be used to determine the flashback and the length of the flame projection of a flammable product enclosed in a pump-spray container as applicable to subsections 1(1), 48(1) and 49(1) and section 52 of the Consumer Chemicals and Containers Regulation, 2001. (SOR/2001-269, P.C. 2001-1343)

## 2 DEFINITIONS

- 2.1 *Spray container*: A container that permits the dispersal of its contents in the form of a mist and includes a pressurized container and a pump-spray container.
- 2.2 *Flame projection*: The flame resulting from the ignition of a chemical product discharged from a spray container when tested in accordance with the procedure set out in schedule 1 of CCCR, 2001.
- 2.3 *Flashback*: The part of the flame projection that extends from the point of ignition back to the spray container when a chemical product is tested in accordance with procedure set out in Schedule 1 of CCCR, 2001.

## 3 APPLICABLE DOCUMENTS

- 3.1 Schedule 1 of the CCCR, 2001, "Test for Determining the Flashback and the Length of the Flame Projection of Products Enclosed in a Spay Container".
- 3.2 Project Report # 2001-0615, "Controlled Force Applicator for use in Pump Spray Container Flammability Testing", Reid Campbell, 2002-01-17
- 3.3 SOP-16, "Standard Operating Procedure for Force Applicator Used in Pump Spray Container Flammability Testing" (Project Report # 2002-0661-S).
- 3.4 Standard for: Cloth, Cotton, and Cheesecloth; CGSB-4-GP-81M.
- 3.5 Project Report # 2002-0661, "Determination of the Number of Discharges and Sprays Required for the Flame Projection and Flashback of consumer Products Packaged in pump Spray Containers."
- 3.6 Project Report # 2002-0661-S "Determination of the Number of Discharges and Sprays Required for the Flame Projection and Flashback of consumer Products Packaged in pump Spray Containers: Supplementary Report"
- 3.7 SOP for Flame Projection Room (Project Report # 2002-0661-S).

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## 4 APPARATUS

- 4.1 Flammability tester, as illustrated in Figure 1, that
- 4.1.1 is designed so that the pump-spray container can be secured in place by means of a device, such as a three-pronged clamp affixed to a ring stand or a suitable equivalent, in such a manner that the discharge from the container is in the horizontal plane,
  - 4.1.2 may include a remote control by which the trigger or plunger of a pump-spray container can be pneumatically activated, as illustrated in figure 2 or the controlled force applicator developed in-house which relies on the use of a known mass (weights) to provide the required test force (18N, 36N, and 54N) to the pump spray lever (see Project Report # 2001-0615 and SOP-16) .
  - 4.1.3 has a vertically mounted burner
    - 4.1.3.1 that has an inside diameter of 1.2 mm (*Note 1*),
    - 4.1.3.2 that is placed at a distance of 15 cm from the discharge orifice of the pump-spray container, such distance to be measured horizontally between the vertical planes of the discharge orifice and the burner orifice,
    - 4.1.3.3 that is adjustable in both the horizontal and vertical planes,
  - 4.1.4 has two support frameworks
    - 4.1.4.1 each having an internal open space 35 cm wide by 45 cm high, constructed from metal or other non-flammable material and mounted in a vertical plane perpendicular to the direction of discharge from the pump-spray container, one being at a distance of 15 cm and the other at a distance of 100 cm from the burner and both being on the opposite side of the burner from the container,
    - 4.1.4.2 that are adjustable in both the horizontal and vertical planes.
  - 4.2 A cylinder of chemically pure (C.P. grade) propane fitted with a regulator capable of delivering pressure to the burner appropriate to maintaining a flame height as specified in para. 7.3.
  - 4.3 Loosely woven cotton fabric commonly referred to as cheesecloth that has, in the bleached state, a mass per unit area of not less than 35 g/m<sup>2</sup> and not more than 55 g/m<sup>2</sup> (conforming to area density of CGSB-4-GP-81M), i.e. product # 4023-10 available from Walmart).

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*Note 1: A 16 gauge Luer-Lock syringe needle affixed to metal tubing has been found satisfactory for this purpose.*



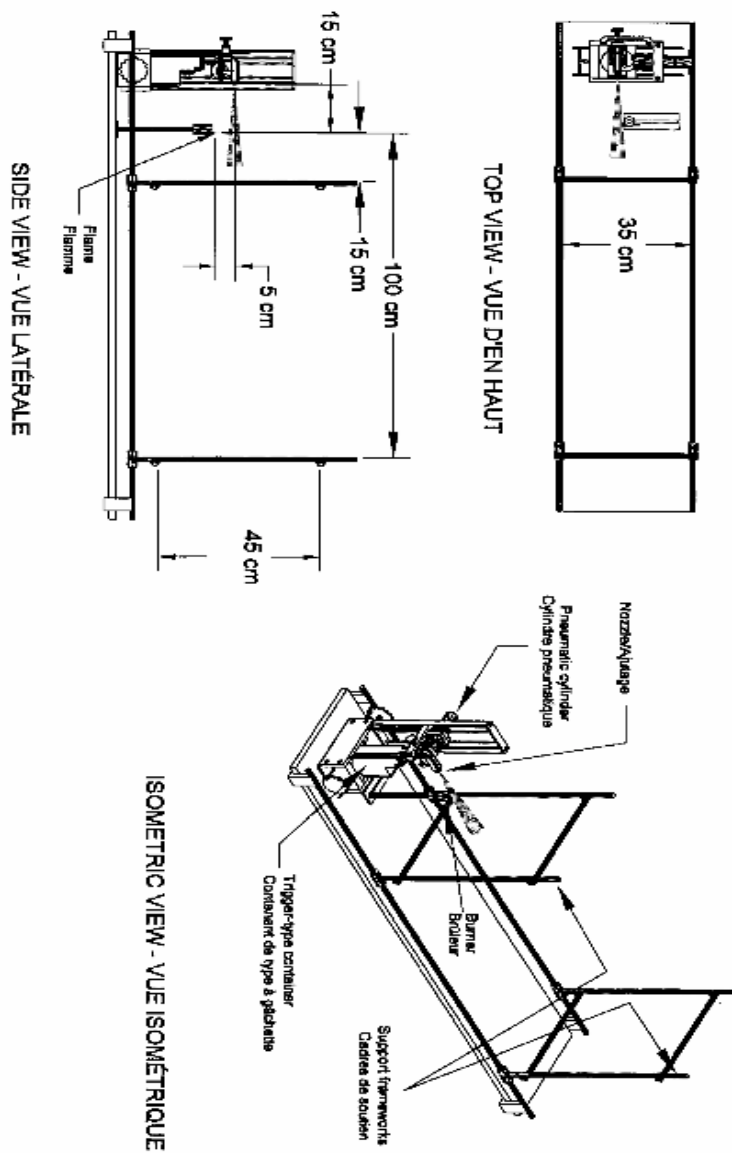
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FIGURE 1  
FLAMMABILITY TESTER – DISPOSITIF VÉRIFICATEUR D'INFLAMMABILITÉ  
PUMP-SPRAY CONTAINER – ATOMISEUR




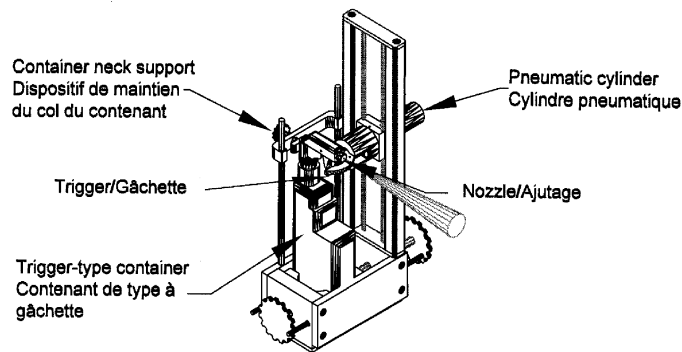
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FIGURE 2  
 HOLDING APPARATUS FOR A TRIGGER-TYPE CONTAINER -  
 APPAREIL DE MAINTIEN POUR CONTENANT DE TYPE À GÂCHETTE  
 ISOMETRIC VIEW - VUE ISOMÉTRIQUE




## 5 SAFETY REQUIREMENTS

- 5.1 Two analysts must be present when the test is performed.
- 5.2 Safety glasses and face masks (especially with chlorinated samples) should be worn.
- 5.3 Water pump-spray bottles and fire extinguisher should be readily available.

## 6 SAMPLING

### 6.1 Test Specimen

- 6.1.1 Where manufacturer's instructions respecting the shaking of the pump-spray container exist, a test comprised of three discharges from each of three specimens of the same product and of the same size shall be conducted in accordance with para. 7.5.
- 6.1.2 Where manufacturer's instructions respecting the shaking of the pressurized container do not exist, a test comprised of three discharges from the container without shaking and subsequently, three discharges after shaking in accordance with subpara. 7.5.1, from each of three specimens of the same product and of the same size shall be conducted.

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## 6.2 Conditioning

- 6.2.1 Each pump spray container shall be conditioned to a temperature of  $22 \pm 2^\circ\text{C}$  for at least 4 hours and the pump-spray container should be primed by activating the trigger or pump using each of 18 N, 36 N and 54 N of pressure for each possible nozzle position until.
- 6.2.1.1 in the case of the “stream” position, a continuous stream is produced,  
and
- 6.2.1.2 in the case of the “spray” position, a mist is produced.


## 7 EXPERIMENTAL PROCEDURE

- 7.1 A test shall be conducted at a temperature of  $22 \pm 2^\circ\text{C}$  in the absence of air current with an allowance made for a clearance of 50 cm beyond the support framework set at a distance of 100 cm from the burner (*Note 2*).
- 7.2 Install the first pump-spray container in the flammability tester and ensure that the burner orifice is 15 cm from the discharge orifice of the container in the horizontal plane and 5 cm below in the vertical plane and that the discharge orifice points in the direction of the burner.
- 7.3 Adjust the burner to give a flame height of 5 cm and release a trial discharges from the pump-spray container and, if no flame projection occurs, lower the burner orifice by 5 cm and adjust the burner to give a flame height of 12 cm. In such a case, proceed therefore with the burner adjusted to 10 cm below the discharge orifice with a 12 cm flame height.
- 7.4 Attach the cheesecloth to the flammability tester with bulldog clips or in any other suitable manner (*Note 3*) so as to cover the entire internal space of the support framework set at a distance of 15 cm from the burner. Verify that the cheesecloth is at the proper horizontal distance from the vertical plane of the burner orifice, and adjust the height of the support framework so that the cheesecloth will intercept the line of the flame projection.
- 7.5 Prepare the pump-spray container in accordance with the manufacturer's instructions and
- 7.5.1 if shaking is applicable,

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*Note 2: 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 readily available.*

*Note 3: In the interest of efficient operation, the cheesecloth should be used for the initial discharge, however, if the cheesecloth ignites, further observations may be performed by visual measurement. However, when testing official samples or when the observed flame projection is within 5 cm of a regulatory limit distance, a cheesecloth barrier shall be used as prescribed.*

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- 7.5.1.1 shake vigorously for 5 seconds, or for the period of time specified in the manufacturer's instructions,
- 7.5.1.2 install the container in the flammability tester, and
- 7.5.1.3 15 seconds after cessation of shaking, release a discharge in accordance with para. 7.6; or
- 7.5.2 if shaking is not applicable, install the container in the flammability tester and release a discharge in accordance with para. 7.6.
- 7.6 Release a discharge
  - 7.6.1 for three sprays; or
  - 7.6.2 until the cheesecloth ignites
  - 7.6.3 during discharge, observe and evaluate to the nearest 1 cm the length of any flashback.
- 7.7 After each discharge, all fumes shall be exhausted and the residue cleaned up. Continue with each subsequent discharges in the following manner,
  - 7.7.1 if shaking is applicable, repeat the procedure referred to in subpara. 7.5.1;
  - 7.7.2 if shaking is not applicable, release the discharge in accordance with para. 7.6. Allow the container to stand for at least 60 seconds between discharges.
- 7.8 In the case of a pump-spray container, repeat the procedure set out in para. 7.6 for each nozzle position (*Note 4*) and each of 18N, 36N and 54N of force.
- 7.9 Where the cheesecloth attached to the support framework set at a distance of 15 cm from the burner ignites, the remaining discharges referred to in para. 6.1 shall be conducted in accordance with para. 7.1 to 7.7, but with a new piece of cheesecloth attached to the support framework set at a distance of 100 cm from the burner.

## 8 DETERMINATION AND REPORTING

- 8.1 Where, at any time during the test, the cheesecloth mounted at a distance of 100 cm from the burner in accordance with para. 7.8 is ignited, the length of the flame projection shall be reported to be 100 cm or more.
- 8.2 Where, at any time during the test, the cheesecloth mounted at a distance of 15 cm from the burner in accordance with para. 7.4 is ignited but the cheesecloth mounted at a distance of 100 cm from the burner in accordance with para. 7.8 is not ignited, the length of the flame projection shall be reported to be 15 cm or more but less than 100 cm.
- 8.3 Where, at any time during the test, the cheesecloth mounted at a distance of 15 cm from the burner in accordance with para. 7.4 is not ignited, but there is a flame projection, the length of the flame projection shall be reported to be less than 15 cm.

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*Note 4: If an adjustable nozzle is tested, record the number of revolutions needed to create a mist or a spray.*

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8.4 The following results observed from any of the test discharges shall be reported:

- 8.4.1 the length of the flame projection (*Note 4*);
- 8.4.2 the absence of flame projection;
- 8.4.3 the occurrence and if so the length of any flashback.

8.5 Where applicable, the test results shall be reported according to the following format:

<i>Sample no.</i>	<i>Specimen</i>	<i>Discharge no.</i>	<i>Flashback (cm)</i>	<i>Flame projection (cm)</i>
SR#	1	1	5 cm	≥ 100 cm

## 9 QUALITY CONTROL PROCEDURES

9.1 Apparatus are calibrated as required.

## 10 PRECISION AND ACCURACY

10.1 There is no known certified control sample available for this test.

..... END .....