 Health Canada / Santé Canada	Title of publication-Titre de la publication Product Safety Reference Manual Book 5 - Laboratory Policies and Procedures	Page F19-1	Effective / En vigueur 2001-10-11
Chapter and/or Section;-Number and title-Chapitre ou section-Numéro et titre Part B: Test Methods Section, Method F-19 TEST METHOD FOR LIGHTERS			Amendment number- / Numéro de la modification 29

1 SCOPE

- 1.1 This method describes procedures for testing lighters for compliance with the Hazardous Products (Lighters) Regulations (hereafter called the Lighters Regulations) and is applicable to item 34 of Part II of Schedule I to the Hazardous Products Act (HPA).
- 1.2 This method covers gas and wick lighters.
- 1.3 This method is provided to facilitate laboratory procedures only. It is the trader's responsibility to ensure that the product is tested according to, and meets the requirements of the HPA and its Regulations.

2 APPLICABLE DOCUMENTS


- 2.1 Hazardous Products (Lighters) Regulations (see Appendix 3).
- 2.2 Product Safety Reference Manual, *Book 4 : Flammable Products*.
- 2.3 Product Safety Laboratory Project Report # 2001-0605, *Revision of Method F-19*.

3 DEFINITIONS

- 3.1 Abnormal Burning Characteristics: See section 9 of the Lighters Regulations.
- 3.2 For other definitions, see section 2 (*Interpretation*) of the Lighters Regulations.
- 3.3 Afterburn: presence of a flame above the fuel orifice of a lighter after the normal action to extinguish the flame has been taken (see paragraph 8(f) of the Lighters Regulations).

4 APPARATUS

- 4.1 Flame Height and Inversion Tests
 - 4.1.1 A test box, measuring approximately 500 mm wide, 300 mm deep and 600 mm high. A steel ruler having 1 mm divisions, vertically mounted on the rear wall of the box. A second ruler mounted at 45° or a scale drawn at 45° on the rear wall of the box with 10 mm divisions or smaller. (The box provides for protection against air drafts which could affect flame-height measurements.)
 - 4.1.2 A set of wooden or aluminum blocks to serve as mounts to ensure that the lighter being tested is at the correct height relative to the zero division of the ruler. Alternatively, the ruler may be mounted such that it can be adjusted upwards or downwards to accommodate the height of the lighter.

 Health Canada / Santé Canada	Title of publication-Titre de la publication Product Safety Reference Manual Book 5 - Laboratory Policies and Procedures	Page F19-2	Effective En vigueur 2001-10-11
Chapter and/or Section;-Number and title-Chapitre ou section-Numéro et titre Part B: Test Methods Section, Method F-19 TEST METHOD FOR LIGHTERS			Amendment number- Numéro de la modification 29

4.1.3 A stopwatch capable of emitting a beep signal at 5 second intervals.

4.1.4 A stopwatch (± 0.2 second) connected to a foot switch.

4.2 Drop Test

4.2.1 A freezer that is capable of maintaining a temperature of $-10 \pm 2^\circ\text{C}$.

4.2.2 A concrete slab with a minimum mass of 55 kg and dimensions of at least 60 cm x 60 cm x 6 cm. See Appendix 2 for further specifications. The concrete slab should be enclosed to contain flying debris; this can be accomplished by surrounding it with a barrier which is at least 30 cm high.

4.2.3 An analytical balance.

4.2.4 Either a stopwatch (± 0.2 second), or a computer linked to the balance. The computer should have software capable of registering the mass at least once per second while tracking the times when the mass registers within 0.1 second.

4.3 Temperature Test

4.3.1 An explosion-resistant, air-circulating oven that is capable of maintaining a temperature of $54 \pm 2^\circ\text{C}$.

4.4 Extended Operation Test

4.4.1 Stand and fixtures (e. g. clamps).

4.4.2 Safety shield.

4.4.3 A stopwatch (± 1 second).

4.5 Pressure Test


4.5.1 A bench-top drill and a 3.06 mm (1/8") drill bit.

4.5.2 A device that is capable of producing an internal gauge pressure of 2 MPa (Figure 1) equipped with a manometer capable of measuring the pressure to the nearest kPa.

4.5.3 A cylinder of nitrogen gas.

4.5.4 An unbreakable container (metal or plastic) of approximately 4 L capacity.


4.5.5 A stopwatch (± 1 second).

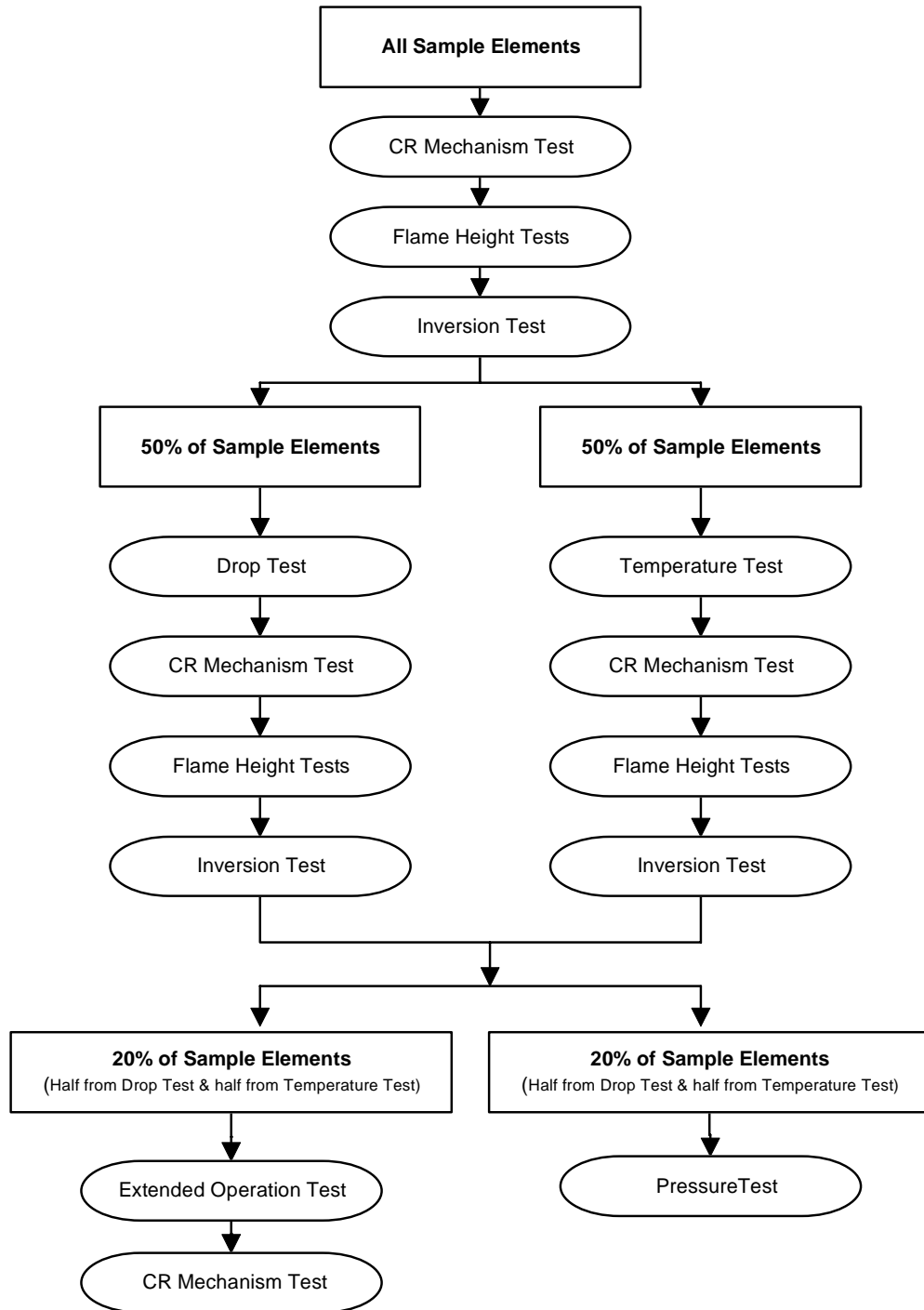
 Health Canada / Santé Canada	Title of publication-Titre de la publication Product Safety Reference Manual Book 5 - Laboratory Policies and Procedures	Page F19-3	Effective / En vigueur 2001-10-11
Chapter and/or Section;-Number and title-Chapitre ou section-Numéro et titre Part B: Test Methods Section, Method F-19 TEST METHOD FOR LIGHTERS			Amendment number- / Numéro de la modification 29


5 TEST PROCEDURES - Gas Lighters

5.1 General

- 5.1.1 Record product characteristics such as wick or gas, adjustable or nonadjustable, disposable or refillable, presence of a shield etc. Record any inscription on the shield or the body of the lighter.
- 5.1.2 Verify and record that all the lighters in the sample have the same lot number. If there is no identifiable lot number then the sample is treated as one lot.
- 5.1.3 Number each lighter in the sample. In the case of disposable lighters, make note of any lighter that is empty. Replace empty lighters with filled ones if any spares are available (i.e. if more lighters than the number required in section 10 were received).
- 5.1.4 Remove a label from one of the lighters and attach it to the record sheet. If the lighter is adjustable, record whether the product complies with section 5 of the Lighters Regulations. If the lighter is refillable, record whether the product was accompanied by refuelling instructions. If so, retain one of the instruction sheets for the records.
- 5.1.5 Follow the procedures in sections 1 to 4 of the Schedule to the Lighters Regulations.
- 5.1.6 Any lighter that exhibits a major defect (see Product Safety Reference Manual Book 4) or that, in any way, can present a danger to the analyst shall be immediately withdrawn from testing.
- 5.1.7 Test the lighters according to the following flow chart using the test methods described in the sections following the chart.

 Health Canada / Santé Canada	Title of publication-Titre de la publication Product Safety Reference Manual Book 5 - Laboratory Policies and Procedures	Page F19-4	Effective En vigueur 2001-10-11
Chapter and/or Section;-Number and title-Chapitre ou section-Numéro et titre Part B: Test Methods Section, Method F-19 TEST METHOD FOR LIGHTERS			Amendment number-Numéro de la modification 29



 Health Canada / Santé Canada	Title of publication-Titre de la publication Product Safety Reference Manual Book 5 - Laboratory Policies and Procedures	Page F19-5	Effective / En vigueur 2001-10-11
Chapter and/or Section;-Number and title-Chapitre ou section-Numéro et titre Part B: Test Methods Section, Method F-19 TEST METHOD FOR LIGHTERS			Amendment number- / Numéro de la modification 29

5.2 Child Resistance (CR) Mechanisms Test

5.2.1 Without unlocking the CR mechanism, attempt to light each lighter at least three times and make note of any lighters that light.

5.3 Flame Height Tests

5.3.1 Stand the lighter on the mount in the test box, ensuring that the top of the shield (or the top of the fuel orifice if no shield is present) is aligned with the zero on the vertical ruler.

5.3.2 Test according to the procedures of section 5 of the Schedule to the Lighters Regulations and record:

- (i) all flame heights
- (ii) flame height ranges for lighters that show sudden increases in flame height
- (iii) any abnormal burning characteristics
- (iv) any occurrence of the CR mechanism not resetting automatically after a test.

5.3.3 If the flame height adjustment mechanism of a lighter is a screw or a similar device which will not stop at a maximum setting, proceed as follows:

- measure the flame height at the minimum setting;
- rotate the flame height adjustment mechanism in increments (e.g. 180° or 360°) and measure the corresponding flame heights.


Caution: eventually the flame height adjustment mechanism may eject from the lighter.

5.3.4 The five-second beep interval of the stopwatch is used to time the flame height measurements.

5.3.5 Use the stopwatch connected to the foot switch to measure any afterburn which may occur.

5.4 Inversion Test

5.4.1 The Inversion Test on each lighter is conducted immediately after its flame height tests. Set the flame height to maximum, light the lighter and adjust the flame height to 50 mm. If, during this flame height adjustment step, the flame height at maximum is significantly different from the one recorded in 5.3, record it. The same applies for any other abnormal burning characteristics. Perform the Inversion Test according to section 6 of the Schedule to the Lighters Regulations, and record any abnormal burning behaviour as listed in section 9 of the Lighters Regulations. Also record any occurrence of the CR mechanism not resetting automatically after the test.

 Health Canada / Santé Canada	Title of publication-Titre de la publication Product Safety Reference Manual Book 5 - Laboratory Policies and Procedures	Page F19-6	Effective En vigueur 2001-10-11
Chapter and/or Section;-Number and title-Chapitre ou section-Numéro et titre Part B: Test Methods Section, Method F-19 TEST METHOD FOR LIGHTERS			Amendment number- Numéro de la modification 29

5.5 Drop Test


- 5.5.1 Test the lighters according to section 8 of the Schedule to the Lighters Regulations.
- 5.5.2 If the concrete slab has a border around its top surface, drop the lighters on the middle area of the slab only.
- 5.5.3 After each of the first two drops, check, by listening (hissing sound) or feeling (cooling effect due to evaporation of fuel) if the lighter is leaking. If a leak is detected, place the lighter on an analytical balance and record the mass loss in milligrams over a period of one minute. After the third drop, even if no leak is apparent, place the lighter on the balance for a minimum of 10 seconds. If a leak is detected, measure the mass loss in milligrams over a period of one minute. If no leak is detected, record that no mass loss was detected. Also record that all lighters were placed on the balance after the horizontal drop for a minimum of 10 seconds.
- 5.5.4 If a lighter loses the major part of its fuel on impact, an attempt to measure the rate of fuel loss can still be made as above. However, if this results in a rate of fuel loss of less than 15 mg/min, it should be recorded and reported that the lighter lost all fuel on impact. In the case where the raw data from the balance is collected by a computer, it is also possible to evaluate the rate of fuel loss from the first five seconds (for example) that the lighter was on the balance.

5.6 Temperature Test

- 5.6.1 Test the lighters according to section 9 of the Schedule to the Lighters Regulations.
- 5.6.2 The fuel status in the lighter is examined by any means, i.e. looking through the lighter casing or, if the casing is opaque, by activating the fuel-release lever and listening to the hissing sound due to escaping fuel or by attempting to light the lighter. As a last resort, in the case of an opaque casing, a hole can be drilled in the fuel reservoir while listening for gas escaping.

5.7 Extended Operation Test

- 5.7.1 Perform the test according to the procedures in section 7 of the Schedule to the Lighters Regulations.
- 5.7.2 Set up a lighter behind a safety shield, unlock the CR mechanism, depress the fuel release lever, light, and let it burn for two minutes. Record any of the burning characteristics given in section 16 of the Lighters Regulations.

 Health Canada / Santé Canada	Title of publication-Titre de la publication Product Safety Reference Manual Book 5 - Laboratory Policies and Procedures	Page F19-7	Effective / En vigueur 2001-10-11
Chapter and/or Section;-Number and title-Chapitre ou section-Numéro et titre Part B: Test Methods Section, Method F-19 TEST METHOD FOR LIGHTERS			Amendment number- / Numéro de la modification 29


5.8 Pressure Test

- 5.8.1 Perform the test according to the procedures of section 10 of the Schedule to the Lighters Regulations.
- 5.8.2 Empty the lighters of fuel in a fume hood by unlocking the CR mechanism and taping down the fuel release lever.
- 5.8.3 Drill a hole in the broad side of the fuel reservoir while avoiding any. (Remove any decorative casing, generally present in refillable lighters, around the fuel reservoir to expose the latter before drilling a hole—in this case, identify the fuel reservoir with the same number as on the casing).
- 5.8.4 Position the lighter into the pressure test device, (see Figure 1) then immerse the assembly under water in the container. Note: it is important to minimize the length and diameter of the tubing attached to the lighter in order to reduce as much as possible the bias on the results this tubing will introduce.
- 5.8.5 Pressurize the lighter with nitrogen at a rate not exceeding 150 kPa/s to a pressure of 1500 kPa and shut off the gas supply. (If at any time, i.e. during or after pressurizing, a leak is observed around the drill-hole, depressurize the assembly, tighten the clamp device a little more and try to re-pressurize).
- 5.8.6 Record the internal pressure of the lighter after one minute and make note of the location of leakage. Note: if it is suspected that a major structural failure (i.e. the lighter breaks apart) occurred due to the lighter being drilled, or from the clamping pressure, the results are not valid. A replacement lighter must then be tested.

6 **TEST PROCEDURES - Wick Lighters**

6.1 General

- 6.1.1 Follow the procedures in sections 1 to 4 of the Schedule to the Lighters Regulations.
- 6.1.2 Verify that all the lighters in the sample have the same lot number. If there is no identifiable lot number then the sample is treated as one lot.
- 6.1.3 Number each lighter in the sample.
- 6.1.4 Any lighter that exhibits a major defect (see Product Safety Reference Manual Book 4) or, in any way, can present a danger to the analyst shall be immediately withdrawn from testing.
- 6.1.5 Perform the Burn Test followed by the Drop Test on all sample elements. Then perform the Burn Test again. See 6.2 and 6.3 for details.

 Health Canada / Santé Canada	Title of publication-Titre de la publication Product Safety Reference Manual Book 5 - Laboratory Policies and Procedures	Page F19-8	Effective En vigueur 2001-10-11
Chapter and/or Section;-Number and title-Chapitre ou section-Numéro et titre Part B: Test Methods Section, Method F-19 TEST METHOD FOR LIGHTERS			Amendment number-Numéro de la modification 29

6.2 Burn Test

6.2.1 Test according to sections 11 of the Schedule to the Lighters Regulations.

6.3 Drop Test

6.3.1 Test according to sections 12 of the Schedule to the Lighters Regulations

7 **QUALITY ASSURANCE/QUALITY CONTROL PROCEDURES**

7.1 Flame height measurements must be conducted in a draft free area (see F-00) under subdued lighting conditions.

7.2 Conditioning and testing are to be done at 23±2°C.

8 **TEST REPORT**

8.1 The test report should contain the following information (see Appendix 1 for a model test report):

8.1.1 A description of the lighters.

8.1.2 A scanned image of the label(s), and instructions for refuelling the lighter (in the case of refillable lighters).

8.1.3 For gas lighters, the test results for each lighter that:

8.1.3.1 Does not meet the requirements of the CR Mechanism Tests.

8.1.3.2 Does not meet the requirements of the Flame Heights Tests.

8.1.3.3 Exhibits abnormal burning characteristics during the Flame Height and Inversion Tests.


8.1.3.4 Exhibits mass loss/rupture during the Drop Test. Also report the orientation in which the lighter was dropped when the defect occurred.

8.1.3.5 Exhibits complete exhaustion of fuel after the Temperature Test.

8.1.3.6 Does not meet the requirements of the Pressure Test.

8.1.3.7 Does not meet the requirements of the Extended Operation Test.

8.1.4 For wick lighters, the test results for each lighter that:

 Health Canada / Santé Canada	Title of publication-Titre de la publication Product Safety Reference Manual Book 5 - Laboratory Policies and Procedures	Page F19-9	Effective En vigueur 2001-10-11
Chapter and/or Section;-Number and title-Chapitre ou section-Numéro et titre Part B: Test Methods Section, Method F-19 TEST METHOD FOR LIGHTERS			Amendment number-Numéro de la modification 29

- 8.1.4.1 Does not meet the requirements of the Flame Height Tests, both initial and those performed after the Drop Test.
- 8.1.4.2 Exhibits abnormal burning characteristics observed during flame height and inversion tests.
- 8.1.4.3 Exhibits rupturing of the fuel reservoir or any other damage that occurred during the Drop Test that would affect the safe operation of the lighter.


9 PRECISION AND BIAS

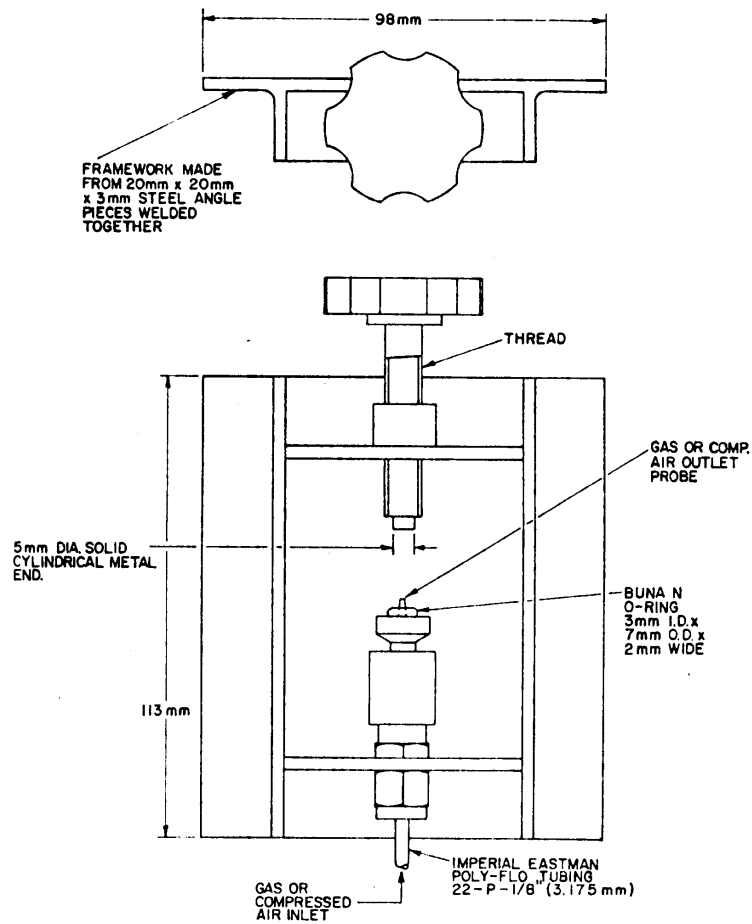
A statement on precision cannot be made due to the destructive nature of the tests.

A statement on bias cannot be made because the true values of the measured parameters are not known.

10 SAMPLING


A typical sample consists of 250 sample elements in the case of gas lighters (except luxury lighters); 30 sample elements in the case of luxury and wick lighters. However, a sample can still be tested if the number of lighters received is less than the stated amounts. All sample elements are taken from the same lot.

 Health Canada / Santé Canada	Title of publication-Titre de la publication Product Safety Reference Manual Book 5 - Laboratory Policies and Procedures	Page F19-10	Effective En vigueur 2001-10-11
Chapter and/or Section;-Number and title-Chapitre ou section-Numéro et titre Part B: Test Methods Section, Method F-19 TEST METHOD FOR LIGHTERS			Amendment number- Numéro de la modification 29



Figure

1: Pressure Test Device

 Health Canada / Santé Canada	Title of publication-Titre de la publication Product Safety Reference Manual Book 5 - Laboratory Policies and Procedures		Page F19-11	Effective En vigueur 2001-10-11
	Chapter and/or Section;-Number and title-Chapitre ou section-Numéro et titre Part B: Test Methods Section, Method F-19 TEST METHOD FOR LIGHTERS			Amendment number- Numéro de la modification 29

APPENDIX 1

STANDARD REPORT FORMAT -- Gas lighters

The product was adjustable, disposable and had a shield. The shield had 'BrandName' imprinted on one side and 'Country' on the other. The 250 sample elements were numbered from 1 to 250. Lighter #208 was empty when received.

Label: [put image of scanned label here]

Note: Any lighter that exhibited a major defect (except for Child Resistance (CR) Mechanism) was immediately withdrawn from testing.

Initial Tests

Child Resistance (CR) Mechanism


No defects were observed.

Flame Height and Inversion

Lighter #	Flame Height (mm)				Inversion	
	Maximum	Abnormal Burning	Minimum	Abnormal Burning	Flame Height (mm) ¹	Abnormal Burning
3	140	3 s afterburn	20			20-70 mm
10	180	3 s afterburn	-			
13	180	spitting	-			
215	140	combustion at a place other than fuel orifice	-			

¹

This column is used to report flame heights and abnormal behaviour observed during adjustment of the lighter prior to the inversion test (see 5.4.1)

 Health Canada / Santé Canada	Title of publication-Titre de la publication Product Safety Reference Manual Book 5 - Laboratory Policies and Procedures		Page F19-12	Effective En vigueur 2001-10-11
	Chapter and/or Section;-Number and title-Chapitre ou section-Numéro et titre Part B: Test Methods Section, Method F-19 TEST METHOD FOR LIGHTERS			Amendment number- Numéro de la modification 29

Drop Test

Lighters numbered from 1 to 125 were subjected to the Drop Test. The following lighters exhibited a fuel loss in excess of 15 mg/min:

- #56 100.4 mg/min inverted drop
- #101 ruptured on impact resulting in complete loss of fuel - horizontal drop
- #122 21.0 mg/min vertical drop

CR Mechanism

Lighter #122 lit without having to unlock the CR mechanism.

Flame Height and Inversion (after the Drop Test)

No defects were observed.

Temperature Test

Lighters numbered from 126 to 250 were subjected to the Temperature Test.


Lighters #190, 204 and 237 were completely exhausted of fuel.

CR Mechanism

No defects were observed.

Flame Height and Inversion (after the Temperature Test)

Lighter #	Flame Height (mm)				Inversion	
	Maximum	Abnormal Burning	Minimum	Abnormal Burning	Flame Height (mm)	Abnormal Burning
126	140		70			
177	190	3 s afterburn	25			
186	165		40			
222	90-170	spitting	0			

 Health Canada / Santé Canada	Title of publication-Titre de la publication Product Safety Reference Manual Book 5 - Laboratory Policies and Procedures	Page F19-13	Effective / En vigueur 2001-10-11
Chapter and/or Section;-Number and title-Chapitre ou section-Numéro et titre Part B: Test Methods Section, Method F-19 TEST METHOD FOR LIGHTERS			Amendment number- / Numéro de la modification 29

Pressure Test

Fifty lighters were subjected to the Pressure Test. The following lighters exhibited a pressure drop in excess of 250 kPa during the one minute test period:

#57 360 kPa
 #143 470 kPa


Extended Operation Test

Fifty lighters were subjected to the Extended Operation Test.

Lighter #124: the plastic part of the head of the lighter ignited.

CR Mechanism

No defects were observed.

 Health Canada / Santé Canada	Title of publication-Titre de la publication Product Safety Reference Manual	Page	Effective En vigueur
	Book 5 - Laboratory Policies and Procedures	F19-14	2001-10-11
Chapter and/or Section;-Number and title-Chapitre ou section-Numéro et titre Part B: Test Methods Section, Method F-19 TEST METHOD FOR LIGHTERS			Amendment number- Numéro de la modification 29

STANDARD REPORT FORMAT - Wick lighters

The product was a refillable wick lighter with a flip-up cover. Closing of this cover is the normal action to extinguish the flame. There were no refuelling instructions nor were there any warning labels. There was a label on the bottom of each lighter marked "Country". The display cases that the lighters came in had the following information on them: "XXX windproof oil lighter" and "Importer, Toronto Ont M1A 1A1".

The 30 lighters were numbered from 1 to 30, filled with it™ lighter fluid and left to condition overnight.

Initial Tests

Flame Height and Inversion

Lighter #	Flame Height (mm)	Abnormal Burning	Inversion
4	10-70		
9	20-90		
13	10	Combustion at a place other than the wick [specify]	

Drop Test


All 30 lighters were subjected to the Drop Test.

- #2 The flip-up cover broke off on the second drop
- #19 The fuel reservoir ruptured on the first drop

Evaluations made after the Drop Test

Flame Height and Inversion

Lighter #	Flame Height (mm)	Abnormal Burning	Inversion
5	10-90		
12	30-90		

 Health Canada / Santé Canada	Title of publication-Titre de la publication Product Safety Reference Manual Book 5 - Laboratory Policies and Procedures	Page F19-15	Effective En vigueur 2001-10-11
Chapter and/or Section;-Number and title-Chapitre ou section-Numéro et titre Part B: Test Methods Section, Method F-19 TEST METHOD FOR LIGHTERS			Amendment number- Numéro de la modification 29

APPENDIX 2

Specifications for concrete used in drop test

Note: The following directions mention dimensions for the frame into which the concrete mixture is poured. These dimensions are only one of many possibilities. The only restrictions on the dimensions of the final product are: minimum width and length of 60 cm, a minimum thickness of 6 cm and a minimum mass of 55 kg. The final product should have a middle area having a uniform texture measuring at least 60 cm x 60 cm, so care should be taken not to make the outside edge too wide (steps C-5 and C-8, below). The texture should not be too smooth, approximating that of a common sidewalk.

Glossary Of Terms

Segregation- The separation of coarse aggregates from the mortar or the water from the ingredients.

Straight Edge- A 2" x 4" wood or similar shaped object with a straight side used to level/flatten the excess concrete from the surface after placement.

Concrete Mixture Data

Components

Approximate quantities for producing
1 cubic metre of fresh concrete

Aggregate Size- 20 mm	1178 kg
Washed Concrete Sand	830 kg
Portland Cement- Type 10	300 kg
Potable Water	116 kg

Strength & Mixture

30 Mpa (Mega Pascals)
6-8% Air Entrainment
75 mm Slump

Construction of Concrete Slabs


A. Tools & Materials

Tools: Hammer, Hand Saw, Square, Pencil, Shovel, 12" Steel Rod, Concrete Vibrator (if available)

Materials: Half Sheet 3/4" Plywood, 12' 2" x 4" Stock, 3" & 2" Common Nails (12 each)


B. Form Preparation

- Using a three-quarter inch thick sheet of plywood, cut a rectangle having dimensions 28" x 28" (71 cm x 71 cm).
- Using 2" x 4" lumber, create a rectangular frame having outside dimensions 28" x 28" with the lumber standing on its narrowest side. Corners should be fastened into one another using 3" common nails.
- With the 2" x 4" frame complete, place it over the plywood cut-out. Align the two units with each other then flip the entire box frame over and place it onto a flat hard surface. Fasten the plywood to the 2" x 4" frame using 2" common nails.
- Once the box frame is secured flip the unit over and place it on a level flat surface.

 Health Canada / Santé Canada	Title of publication-Titre de la publication Product Safety Reference Manual Book 5 - Laboratory Policies and Procedures	Page F19-16	Effective En vigueur 2001-10-11
Chapter and/or Section;-Number and title-Chapitre ou section-Numéro et titre Part B: Test Methods Section, Method F-19 TEST METHOD FOR LIGHTERS			Amendment number- Numéro de la modification 29

C. Concrete Placement

1. Place concrete mixture (as per specifications) into box frame using a shovel or similar handling device. Care should be taken to avoid *segregation* of the mixture when placing into the form.
2. Once the box frame has been filled, consolidate the concrete into the corners and edges using a steel rod or concrete vibrator.
3. Place a *straight edge* (2" x 4" or equivalent) over the box frame resting over two opposite sides. Starting from one side work the straight edge over the concrete keeping it flat on the box frame edges.
4. Once the excess concrete has been stricken off the surface use a wooden float to further consolidate any openings on the surface. The wooden float should be worked back across the surface area in a flat circular motion.
5. Use a concrete edging tool to create a smooth outside surface along the perimeter of the form. Once complete allow concrete to set until surface has stiffened. *Note: Time required will vary depending on air temperature. Higher temperatures increase setting time. Concrete should be checked every 20 minutes for workability.*
6. Using an aluminum magnesium trowel, work the concrete surface in both directions to fill any small air pockets/voids until the surface is smooth.
7. With a smooth bristle broom create an even line pattern across the slab by pulling the broom in a backward direction.
8. Complete concrete finish by repeating step # 5.
9. After allowing to set for a 48 hour period, gently remove form work by extracting the nails.

 Health Canada / Santé Canada	Title of publication-Titre de la publication Product Safety Reference Manual Book 5 - Laboratory Policies and Procedures	Page F19-17	Effective En vigueur 2001-10-11
Chapter and/or Section;-Number and title-Chapitre ou section-Numéro et titre Part B: Test Methods Section, Method F-19 TEST METHOD FOR LIGHTERS			Amendment number- Numéro de la modification 29

APPENDIX 3

Hazardous Products (Lighters) Regulations²

SOR/89-514

P.C. 1989-2151 26 October, 1989

Her Excellency the Governor General in Council, on the recommendation of the Minister of Consumer and Corporate Affairs, pursuant to section 5* of the Hazardous Products Act, is pleased hereby to revoke the Hazardous Products (Lighters) Regulations, made by Order in Council P.C. 1979-3095 of November 15, 1979**, and to make the annexed Regulations respecting the advertising, sale and importation of hazardous products (lighters), in substitution therefor.

* R.S., c. 24 (3rd Supp.), s. 1

** SOR/79-843, 1979 Canada Gazette Part II, p. 4318

REGULATIONS RESPECTING THE ADVERTISING, SALE AND IMPORTATION OF HAZARDOUS PRODUCTS (LIGHTERS)

Short Title

1. These Regulations may be cited as the *Hazardous Products (Lighters) Regulations*.

Interpretation

2. In these Regulations,

"gas lighter" means a product utilizing as fuel liquefied hydrocarbons, such as n-butane and isobutane, with a vapour pressure at 24°C that exceeds a gauge pressure of 100 kPa; (briquet à gaz)

"luxury lighter" means a product that is designed to be refilled with fuel and that has, where the product is manufactured in Canada, a value of greater than \$2.50 on sale by the manufacturer and, where the product is imported into Canada, a value for duty of greater than \$2.50 as determined in accordance with section 46 of the Customs Act; (briquet de luxe)

"product" means a lighter included in item 34 of Part II of Schedule I to the Hazardous Products Act; (produit)


"production lot" means a group of substantially identical products manufactured by the same manufacturer under substantially identical conditions; (lot de production)

"shield" means a structure that totally or partially surrounds the fuel orifice of a product and projects beyond it; (écran de protection)

"spitting" means an escape of liquid fuel that produces a shower of burning droplets which separate from the main flame; (crachotement)

²

This consolidation is prepared for convenience only. For all purposes of interpreting and applying the law, users should consult the regulations, as registered by the Clerk of the Privy Council and published in Part II of the Canada Gazette.

 Health Santé Canada Canada	Title of publication-Titre de la publication Product Safety Reference Manual Book 5 - Laboratory Policies and Procedures	Page F19-18	Effective En vigueur 2001-10-11
Chapter and/or Section;-Number and title-Chapitre ou section-Numéro et titre Part B: Test Methods Section, Method F-19 TEST METHOD FOR LIGHTERS			Amendment number- Numéro de la modification 29

"successful operation" means the emission of an audible or visual signal, when a surrogate lighter is being tested; (actionner)

"surrogate lighter" means a device used for testing purposes that

- (a) approximates the appearance, size and weight of the product that it represents,
- (b) is, within reasonable manufacturing tolerances, identical to the product that it represents in all factors that affect child-resistance, including the operation and force or forces required for operation,
- (c) has no fuel, and
- (d) produces a clearly discernible audible or visual signal instead of a flame. (briquet de substitution)

"wick lighter" means a product utilizing as fuel liquid hydrocarbons, such as hexane, with a vapour pressure at 24°C that does not exceed a gauge pressure of 34 kPa. (briquet à essence) SOR/91-261, s. 1; SOR/95-252, s. 1.

General

3. A product may be advertised, sold or imported if the product meets the requirements of these Regulations.

Luxury Lighter Records

3.1 Any person who manufactures or imports a luxury lighter shall, for a period of six years beginning on the date of sale by the manufacturer or the date of importation, as the case may be, maintain records that identify the luxury lighter and that show

- (a) in the case of a luxury lighter manufactured in Canada, the value on sale by the manufacturer; and
- (b) in the case of an imported luxury lighter, the value for duty as determined in accordance with section 46 of the Customs Act. SOR/95-252, s. 2.


Compliance Certificate

3.2 The manufacturer and the importer of a product other than a luxury lighter shall


- (a) possess a certificate that states in English or French that the surrogate lighter of the product has been tested and complies with the requirements set out in subsection 7.1(2) for child-resistance and
 - (i) the name and address of the person who issued the certificate;
 - (ii) the name and address of the manufacturer of the product, and
 - (iii) the name and model of the product;
- (b) keep a copy of the certificate for three years beginning on the date of manufacture or importation of the product, as the case may be; and
- (c) within 15 days after a request by an inspector, make available in English or French the test data on which the statement referred to in paragraph (a) is based, including the information set out in 1210.4(g)(1) to (10) of Title 16 of the Code of Federal Regulations (United States), as amended from time to time, and the name and model of the product to which the test data relates. SOR/95-252, s. 2.

PART I

LABELLING REQUIREMENTS

 Health Canada / Santé Canada	Title of publication-Titre de la publication Product Safety Reference Manual Book 5 - Laboratory Policies and Procedures	Page F19-19	Effective En vigueur 2001-10-11
Chapter and/or Section;-Number and title-Chapitre ou section-Numéro et titre Part B: Test Methods Section, Method F-19 TEST METHOD FOR LIGHTERS			Amendment number- Numéro de la modification 29

4. (1) Every product shall have permanently marked on it, in such a manner that the mark shall remain clear and visible throughout the useful life of the product,
- (a) the name of the manufacturer, in roman characters; or
 - (b) a trade mark registered in Canada or for which an application for registration in Canada is pending.
- (2) Where more than one production lot is offered for sale, every product shall have marked on it, in a clear and visible manner, a means of identifying the production lot of which that product forms a part.
- (3) Subject to subsection (4), every product shall have marked on it, in a clear and visible manner,
- (a) where the product is manufactured in Canada, the principal place of business of the manufacturer or the name and principal place of business of the distributor;
 - (b) where the product is not manufactured in Canada, the name and principal place of business of the importer or distributor in Canada; and
 - (c) the warning: "KEEP OUT OF REACH OF CHILDREN/TENIR HORS DE LA PORTÉE DES ENFANTS" or any other warning that conveys the same meaning.
- (4) The information required under subsection (3) may be marked
- (a) on the package, where the product is enclosed in a sealed package; or
 - (b) on the package or on the instructions within the package, where the product is individually enclosed in an unsealed package. SOR/95-252, s. 3.
5. Every product that has a device to adjust the flame height shall have permanently marked on it, in such a manner that the mark shall remain clear and visible throughout the useful life of the product, an easily understood symbol indicating the direction in which force is to be applied to increase and decrease the flame height.
6. Every product that is designed to be refuelled shall be accompanied by instructions that clearly set out, in English and in French, the safe method of refuelling the product, including
- (a) information as to the type of fuel to be used to refill the product and a warning to use only that type of fuel;
 - (b) a warning to keep lighters and fuels therefor out of the reach of children;
 - (c) in the case of a gas lighter, a warning to ensure proper mating between the refill container and the fuel reservoir of the lighter; and
 - (d) in the case of a wick lighter, a warning to fill the lighter slowly, to avoid overfilling and to wipe dry the lighter and the hands of the user before activating the lighter.

 Health Canada / Santé Canada	Title of publication-Titre de la publication Product Safety Reference Manual Book 5 - Laboratory Policies and Procedures	Page F19-20	Effective En vigueur 2001-10-11
Chapter and/or Section;-Number and title-Chapitre ou section-Numéro et titre Part B: Test Methods Section, Method F-19 TEST METHOD FOR LIGHTERS			Amendment number-Numéro de la modification 29

PART II

DESIGN AND PERFORMANCE REQUIREMENTS

Application of Force

7. (1) Every luxury lighter shall be designed in such a manner as to require at least one of the following manual operations by a person using it in order to produce a flame:

- (a) a deliberate action to produce and maintain a flame;
- (b) two separate and distinct actions to achieve ignition; and
- (c) the application of a force equal to or greater than 15 N to produce a flame.

(2) Every product that has a device to adjust the flame height shall be designed in such a manner as to require the deliberate application of a reasonable force by a person using the product in order to adjust the flame height. SOR/95-252, s. 4.

Child-resistance Requirements

7.1 (1) All products, other than luxury lighters, shall be child-resistant.

(2) For the purposes of subsection (1), a product is child-resistant where its surrogate lighter has been tested in accordance with the test protocol described in section 1210.4, without regard to sections 1210.4(a)(3) and (b)(1), of Title 16 of the Code of Federal Regulations (United States), as amended from time to time, and has been resistant to successful operation by at least 85 per cent of the children participating in the test. SOR/95-252, s. 5.

7.2 The mechanism or system that makes a product child-resistant shall

- (a) require that the user perform at least two separate and distinct actions to achieve ignition;
- (b) reset itself automatically after each operation of the ignition mechanism of the product;
- (c) where the product is a gas lighter, continue to function effectively after each test set out in sections 5 to 9 of the schedule; and
- (d) where the product is a wick lighter, continue to function effectively after each test set out in sections 11 and 12 of the schedule. SOR/95-252, s. 5.


Flame Height of Gas Lighters

8. A gas lighter, when tested in accordance with the procedures described in sections 5 and 6 of the schedule and

- (a) section 8 of the schedule, followed by the procedures described in sections 5 and 6 thereof, or
- (b) section 9 of the schedule, followed by the procedures described in sections 5 and 6 thereof,

shall

- (c) where the lighter has neither a shield nor a device to adjust the flame height, have a vertical flame height not exceeding 50 mm,
- (d) where the lighter has a shield but no device to adjust the flame height, have a vertical flame height not exceeding 100 mm,
- (e) where the lighter has a device to adjust the flame height, have a vertical flame height not exceeding
 - (i) 150 mm, where the device is adjusted to produce maximum flame height, and
 - (ii) 50 mm, where the device is adjusted to produce minimum flame height, and
- (f) not exhibit a flame above the fuel orifice for more than two seconds after the normal action to extinguish the flame has been taken.

 Health Canada / Santé Canada	Title of publication-Titre de la publication Product Safety Reference Manual Book 5 - Laboratory Policies and Procedures	Page F19-21	Effective / En vigueur 2001-10-11
Chapter and/or Section;-Number and title-Chapitre ou section-Numéro et titre Part B: Test Methods Section, Method F-19 TEST METHOD FOR LIGHTERS			Amendment number- / Numéro de la modification 29

Abnormal Burning of Gas Lighters

9. A gas lighter, when tested in accordance with at least one of the procedures described in sections 5, 6 and 8 to 10 of the schedule, shall not exhibit

- (a) a sudden increase in flame height of 50 mm or more;
- (b) a vertical flame height in excess of the maximum values prescribed by section 8;
- (c) an explosion;
- (d) combustion at any place other than at the fuel orifice of the product or in the main flame;
- (e) spitting; or
- (f) any other abnormal or unsafe burning characteristics.

Abnormal Burning of Wick Lighters

10. A wick lighter, when tested in accordance with the procedures described in section 11 of the schedule and with the procedures described in section 12 thereof followed by those described in section 11 thereof, shall not exhibit

- (a) a sudden increase in flame height of 50 mm or more;
- (b) an explosion;
- (c) combustion at any place other than at the wick; or
- (d) any other abnormal or unsafe burning characteristics.

Structural Integrity of Gas Lighters

11. A gas lighter, when tested in accordance with the procedures described in section 8 or 9 of the schedule, shall not exhibit damage that would make the operation of the lighter unsafe.

12. A gas lighter, when tested in accordance with the procedures described in section 8 of the schedule, shall not exhibit an escape of fuel exceeding 15 mg per minute.

13. A gas lighter, when tested in accordance with the procedures described in section 9 of the schedule, shall not exhibit leakage that results in total exhaustion of fuel after the cooling period described in paragraph 9(2)(c) of the schedule.

14. A gas lighter, when tested in accordance with the procedures described in section 10 of the schedule, shall not exhibit a drop in internal pressure of more than 250 kPa per minute.


Structural Integrity of Wick Lighters

15. A wick lighter, when tested in accordance with the procedures described in section 12 of the schedule, shall not exhibit rupture of its fuel reservoir or any other damage that would affect its safe operation.

Extended Operation of Gas Lighters

16. A gas lighter, when tested in accordance with the procedures described in section 7 of the schedule, shall not exhibit, during a continuous burning time of two minutes,

- (a) ignition of the component parts;
- (b) expulsion of the valve mechanism; or
- (c) rupture of the fuel reservoir, with or without flame.

 Health Canada / Santé Canada	Title of publication-Titre de la publication Product Safety Reference Manual Book 5 - Laboratory Policies and Procedures	Page F19-22	Effective En vigueur 2001-10-11
Chapter and/or Section;-Number and title-Chapitre ou section-Numéro et titre Part B: Test Methods Section, Method F-19 TEST METHOD FOR LIGHTERS			Amendment number-Numéro de la modification 29

(ss. 8 to 16)

TEST PROCEDURES FOR LIGHTERS

GENERAL

1. Where a product is not fuelled at the point of sale, it shall be fuelled in accordance with the manufacturer's instructions using the fuel recommended by the manufacturer prior to testing in accordance with sections 5 to 9 and 11 and 12.
2. (1) The product shall be maintained at a temperature of $23 \pm 2^{\circ}\text{C}$ for at least 10 hours immediately preceding testing in accordance with sections 5 to 7 and 9 to 12.
 - (2) The area in which tests are conducted shall be maintained at a temperature of $23 \pm 2^{\circ}\text{C}$ during testing.
3. (1) Flame height measurements shall be taken
 - (a) inside a draft-free chamber constructed from a suitable non-flammable material; and
 - (b) with the product positioned to produce a vertically upward flame.
 - (2) The flame height shall be measured to the nearest 5 mm.
 - (3) All flame tests shall be conducted in subdued lighting conditions.
4. Any damage sustained by a product or any abnormal or unsafe functioning of the product during a test shall be recorded.

GAS LIGHTERS


Flame Tests

Flame Height Test

5. The procedures to be used to measure the flame height of a gas lighter are as follows:
 - (a) where the lighter is equipped with a device to adjust the flame height, test the lighter first with the device adjusted to produce maximum flame height and secondly with the device adjusted to produce minimum flame height;
 - (b) activate the lighter to produce a flame for a continuous five-second period;
 - (c) where the lighter has no shield, measure and record the maximum linear distance observed between the tip of the visible flame and the top of the fuel orifice;
 - (d) where the lighter has a shield, measure and record the maximum linear distance observed between the tip of the visible flame and the top of the shield or, where the shield is retractable, the top of the shield in its fully withdrawn position;
 - (e) take the normal action to extinguish the flame; and
 - (f) measure and record the duration of any burning that occurs immediately after the normal action to extinguish the flame has been taken.

Inversion Test

6. The procedures to be used in conducting an inversion test of a gas lighter are as follows:
 - (a) where the lighter is equipped with a device to adjust the flame height, adjust the device to produce a vertically upward flame with a flame height of 50 mm;

 Health Canada / Santé Canada	Title of publication-Titre de la publication Product Safety Reference Manual Book 5 - Laboratory Policies and Procedures	Page F19-23	Effective En vigueur 2001-10-11
Chapter and/or Section;-Number and title-Chapitre ou section-Numéro et titre Part B: Test Methods Section, Method F-19 TEST METHOD FOR LIGHTERS			Amendment number-Numéro de la modification 29

- (b) activate the lighter;
- (c) turn the lighter to an inverted hand-held position 45° below the horizontal for a continuous 10-second period after which return the lighter to the original vertical position;
- (d) take the normal action to extinguish the flame; and
- (e) measure and record the duration of any burning that occurs immediately after the normal action to extinguish the flame has been taken.

Extended Operation Test

7. The procedures to be used in conducting a gas lighter extended operation test are as follows:

- (a) where the lighter is equipped with a device to adjust the flame height, adjust the device to produce a flame height of 50 mm;
- (b) activate the lighter to produce a vertical flame for a continuous two-minute period after which take the normal action to extinguish the flame; and
- (c) observe and record any ignition of the component parts of the lighter, expulsion of the valve mechanism or rupture of the fuel reservoir, with or without flame.

Structural Integrity Tests

Drop Test

8. (1) The test apparatus required for a gas lighter drop test is a horizontal concrete slab with a minimum mass of 55 kg and dimensions of at least 60 cm × 60 cm × 6 cm.

(2) The procedures to be used in conducting a gas lighter drop test are as follows:


- (a) where the lighter is equipped with a device to adjust the flame height, adjust the device to produce a flame height of 50 mm;
- (b) maintain the lighter at a temperature of $-10 \pm 2^\circ\text{C}$ for a period of at least 10 hours after which maintain the lighter at a temperature of $23 \pm 2^\circ\text{C}$ for a period of at least 10 hours;
- (c) immediately after the procedure described in paragraph (b), cause the lighter to fall three times from a height of 1.5 m onto the concrete slab
 - (i) first, from an upright vertical position,
 - (ii) secondly, from an inverted vertical position, and
 - (iii) thirdly, from a horizontal position;
- (d) inspect the lighter immediately after each fall for escape of fuel and record any damage; and
- (e) measure and record any escape of fuel to the nearest milligram per minute.

Temperature Test

9. (1) The test apparatus required for a gas lighter temperature test is an oven, preferably explosion-resistant, capable of maintaining a temperature of $54 \pm 2^\circ\text{C}$.

(2) The procedures to be used in conducting a gas lighter temperature test are as follows:

- (a) where the lighter is equipped with a device to adjust the flame height, adjust the device to produce a flame height of 50 mm;
- (b) place the lighter in the oven and maintain a temperature in the oven of $54 \pm 2^\circ\text{C}$ for a period of four hours;
- (c) remove the lighter from the oven and maintain the lighter at a temperature of $23 \pm 2^\circ\text{C}$ for a period of at least 10 hours; and
- (d) inspect the lighter and record any damage and any instance of total loss of fuel.

 Health Canada / Santé Canada	Title of publication-Titre de la publication Product Safety Reference Manual Book 5 - Laboratory Policies and Procedures	Page F19-24	Effective / En vigueur 2001-10-11
Chapter and/or Section;-Number and title-Chapitre ou section-Numéro et titre Part B: Test Methods Section, Method F-19 TEST METHOD FOR LIGHTERS			Amendment number- / Numéro de la modification 29

Pressure Test

10. (1) The test apparatus required for a gas lighter pressure test is a device capable of producing a gauge pressure of 2 MPa.
- (2) The procedures to be used in conducting a gas lighter pressure test are as follows:
- (a) empty the fuel reservoir of the lighter;
 - (b) subject the fuel reservoir of the lighter to an internal pressure of 1.5 MPa but do not permit the internal pressure to rise at a rate which exceeds 150 kPa per second; and
 - (c) observe the lighter for 60 seconds and record any drop in internal pressure.

WICK LIGHTERS

Burn Test

11. The procedures to be used in conducting a wick lighter burn test are as follows:
- (a) position the lighter to produce a vertically upward flame;
 - (b) activate the lighter to produce a flame for a continuous 10-second period after which take the normal action to extinguish the flame;
 - (c) reactivate the lighter and turn it to an inverted hand-held position 45° below the horizontal for a continuous 10-second period after which turn the lighter to the original vertical position;
 - (d) take the normal action to extinguish the flame; and
 - (e) observe and record any abnormal or unsafe burning characteristics.

Drop Test

12. (1) The test apparatus required for a wick lighter drop test is a horizontal concrete slab as described in subsection 8(1).
- (2) The procedures to be used in conducting a wick lighter drop test are as follows:
- (a) cause the lighter to fall three times from a height of 1.5 m onto the concrete slab,
 - (i) first, from an upright vertical position,
 - (ii) secondly, from an inverted vertical position, and
 - (iii) thirdly, from a horizontal position; and
 - (b) inspect the lighter after each fall and record any damage.

..... END