

GUERNSEY STATUTORY INSTRUMENT
1994 No 10

The Health and Safety at Work (Highly Flammable Liquids)
(Guernsey) Regulations, 1988

Made 24th May, 1988
Coming into operation 25th May, 1988

THE STATES LABOUR AND WELFARE COMMITTEE, in exercise of the powers conferred upon it by section 36 (1)(d) of the Health and Safety at Work (General) (Guernsey) Ordinance, 1987, and in exercise of all other powers enabling it in that behalf, hereby makes the following Regulations: -

Highly Flammable Liquids

1. Schedules 1 and 2 to these Regulations shall have effect for prescribing methods of test for the determination of a "highly flammable liquid" specified under paragraph 6 of Schedule 2 of the Health and Safety at Work (General) (Guernsey) Ordinance, 1987.

Interpretation

2. The Interpretation (Guernsey) Law, 1948 applies to the interpretation of these Regulations as if they were an enactment.

Citation

3. These Regulations may be cited as the Health and Safety at Work (Highly Flammable Liquids) (Guernsey) Regulations 1988.

Commencement

4. These Regulations shall come into operation on the 25th day of May 1988.

Dated this 24th day of May, 1988.



President of the
States Labour and Welfare Committee

SCHEDULE 1
METHOD OF TEST BY FLASHPOINT (CLOSED CUP METHOD)

Regulation 1

Scope

1. The method describes a procedure for determining if a flammable liquid when maintained at the specified temperature of 32°C and under the condition of test, gives off sufficient flammable vapour at this temperature to cause ignition on application of an external source of flame applied in a standard manner.

Principle of the method

2. (1) The test portion is heated in an Abel closed cup in a suitable water-bath. The ignition trial is carried out after the test portion has been maintained under equilibrium conditions for at least 10 minutes at 32°C at 760mm of mercury or at the equivalent temperature having made due allowance for variation in barometric pressure (see paragraph 5(2) of this Schedule).

(2) This procedure ensures that the air/vapour space above the test sample has attained the saturation concentration of flammable vapour at the required temperature before the ignition trial is performed. The test report records whether or not a flash occurs at this temperature.

Apparatus

3. (1) The test cup shall be the Abel closed cup and cover, with or without stirrer, as illustrated in the Appendix to this Schedule and constructed to the dimensions specified in Tables 1, 2 and 3 to this Schedule within the limits of accuracy prescribed by the tolerances there stated. If the stirrer is used during the heating up period it should be stopped during the ignition test. If the stirrer is removed, the aperture in the lid should be securely plugged before starting the tests.

(2) Any suitable water-bath capable of being adjusted to a temperature of 32°C and of adequate heat capacity to meet the requirements of paragraph 5(7) of this schedule may be used. A bath fitted with a stirrer and an adjustable thermostat is convenient.

(3) The test cup shall be fitted with a thermometer, which is immersed in the sample for measuring its temperature. The water-bath shall be fitted with a thermometer of equal precision for measuring the water temperature. The test cup thermometer shall be the Abel oil cup Celsius thermometer (10°C to 65°C) (see Table 4 to this Schedule for the specification).

(4) A suitable support shall be provided for holding the test cup so that the lid and upper edge are horizontal and the cup is immersed in direct contact with the water in such a position that the level of the test sample in the cup is the same as that of the water in the water-bath.

Sampling

4. (1) The sample shall be representative of the material being tested and shall be kept, prior to test, in an air tight container.

(2) Because of the possibility of loss of volatile constituents the sample shall receive only the minimum treatment to ensure uniformity. After removing a portion for test, the sample container shall be immediately closed tightly to ensure that no volatile flammable components escape from the container.

Procedure

5. (1) Obtain and prepare the test sample as described in paragraph 4 of this Schedule, and ensure that at all times during this preparation its temperature does not exceed 30°C.
- (2) Adjust the temperature of the bath to and maintain it at 32°C (within an accuracy of $-0 + 0.5^{\circ}\text{C}$) or to the corrected temperature after allowing for difference of barometric pressure from the standard (760 mm of mercury or 1013 millibar) by raising the test temperature for a higher or lowering the test temperature for a lower pressure at the rate of 1°C for each 30 mm of mercury (40 millibar) difference.
- (3) Carefully clean and dry the Abel cup, the cover and the cup thermometer and then cool to at least 30°C.
- (4) Fill the Abel cup with the test sample until the internal level indicator just disappears under the surface of the liquid. Take care to avoid the formation of bubbles and contact between the sample and the cup wall above the level indicator. If this occurs to a significant extent, empty the cup, prepare it again according to paragraph 5(3) of this Schedule and fill it with a fresh portion of the sample.
- (5) Immediately after filling the test cup, place the cover in position and support the cup in the bath so that the cover is horizontal and the cup is immersed with the surface of the test portion at the same level as the water in the bath.
- (6) Light the flame of the ignition device and adjust it to the size of the bead of diameter 3.5 ± 0.5 mm.
- (7) Ten minutes after the test portion has reached within 0.5°C of 32°C or the equivalent temperature adjusted for barometric pressure difference perform the ignition trial by opening the slide, inserting and removing the nozzle of the ignition device, and closing the slide again, in a period of 2.5 ± 0.5 seconds.
- (8) The material shall only be deemed to have flashed if a comparatively large blue flame appears and propagates over the surface of the liquid. In case of doubt the test should be repeated with a fresh portion of the sample and if the doubt is not resolved by the second test, the sample should be regarded as having flashed.
- (9) If a large blue flame does not appear as a flash but instead a continuous luminous flame burns in the orifice caused by opening the slide when the ignition flame is introduced, then the flashpoint will be considerably below 32°C.

Report of the test

5. The test report should include the following information: -
 - (1) The type and identification of the material under test.
 - (2) The test temperature in °C and barometric pressure in mm of mercury or millibar.
 - (3) A statement as to whether a flash occurred in the course of carrying out the test procedure described in paragraph 5 of this Schedule.
 - (4) The date of the test.

Table 1

DIMENSIONS OF OIL CUP

	Dimensions in mm
Cup, wall and bottom thickness	1.4 ± .1
Cup, internal diameter	49.5 – 52.0
Cup, internal depth	55 – 57
Flange, thickness	1.4 ± .1
Flange, width	12.5 – 13.5
Flange, distance of upper side from top edge of cup	8.2 – 10.8
Gauge, thickness	3.35 ± .1
Gauge, distance of point from level of upper edge of cup	17.7 – 17.9

Table 2

DIMENSIONS OF COVER

	Dimensions in mm
Cover thickness	1.3 – 1.6
Cover, central hole, length (in direction of slide)	12.6 – 12.8
width	10.0 – 10.3
Cover, peripheral holes, length (in direction of slide)	4.9 – 5.1
width	7.5 – 7.7
Slide, thickness	0.9 ± .1
Slide, width of upper surface	12.7 – 12.9
Lamp, overall length of jet	15 approx.
Lamp, bore of jet at end	1.46 – 1.71
Bead, diameter	3.0 – 4.0
Thermometer socket:	
Internal diameter	15.0 – 15.5
Length of short side measured from under surface of cover	13 approx
Length of long side measured from under surface of cover	19 approx.
Distance of centre of socket from centre of cover measured on the underside	18 approx.
The dimensions relating to the thermometer socket are subject to the correct placing of the thermometer when in position.	
Vertical depth of lowest part of thermometer below centre of underside of cover	25.5 – 40.5

Table 3

DIMENSIONS OF STIRRER

	Dimensions in mm
Stem, length overall	99 – 104
Stem, length. Lower end to point of attachment blades	2.5 approx.
Stem, length. Lower end to upper surface of collar	45 – 51
Stem, length. Upper surface of collar to lower end of thread	48 – 53
Diameter of stem	3 approx.
Diameter of stem collar	6.3 approx.
Blades, thickness	$1.4 \pm .1$
Blades, length excluding root	12.4 – 12.9
Blades, breadth (all corners of blades rounded)	7.7 – 8.2
Blades, blade angle	45° approx.
Sleeve, length	To suit stem, giving free rotation with no appreciable vertical play when screwed home
Diameter of bore	Sliding fit on stem
Diameter of sleeve collar	6.3 approx.

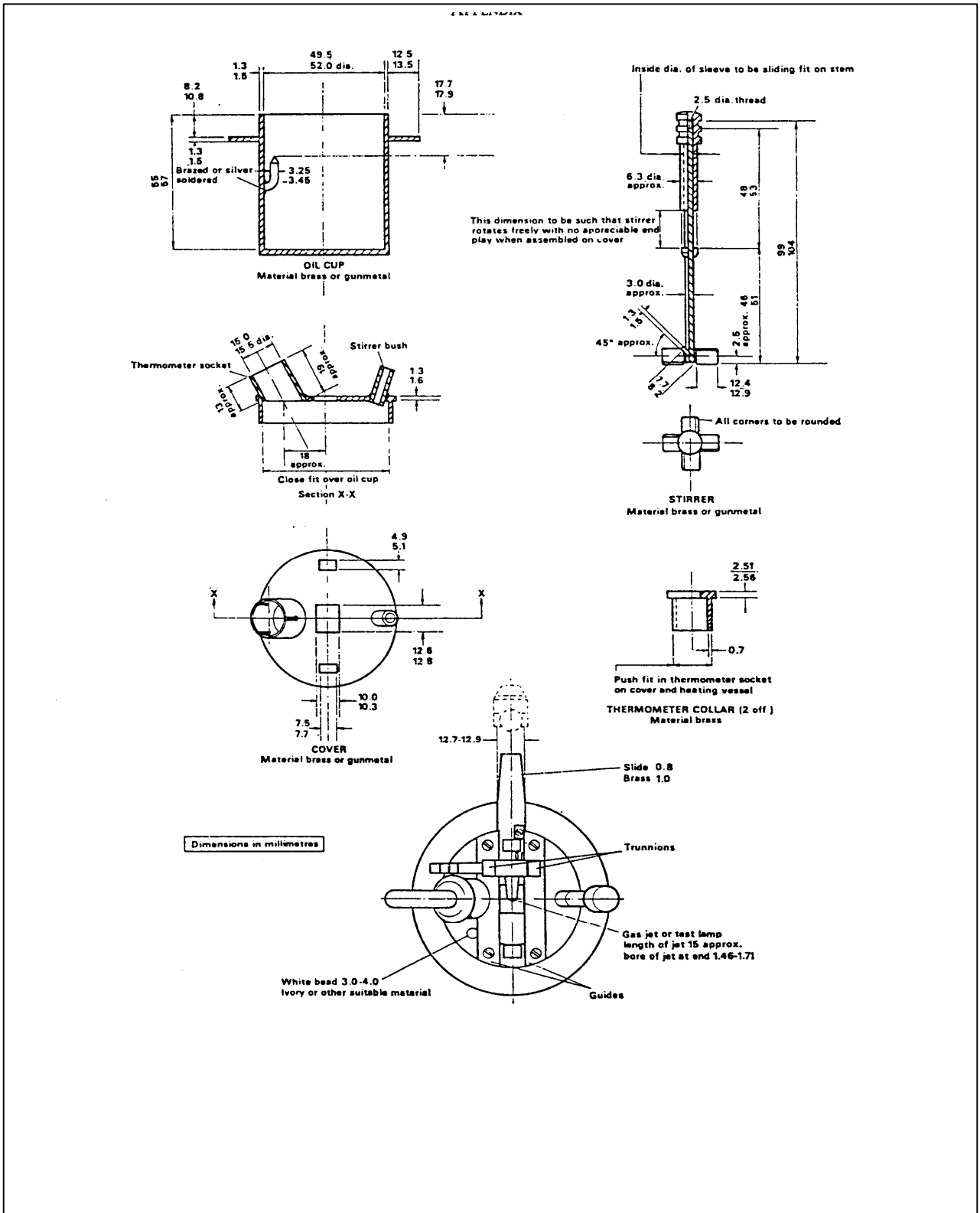
Table 4

THERMOMETER SPECIFICATION

Name	Abel Oil Cup Celsius (10°C – 65°C)
Range	10°C – 65°C
Graduation	0.5°C
Overall length	228 mm ± 10 mm
Stem diameter	6 – 7 mm
Length of graduated portion	At least 120.6 mm
Distance, bottom of bulb to 10°C mark	70 – 80 mm
Longer lines at each	1°C and 5°C
Figured at each	5°C
Expansion chamber	Required
Top finish	Plain
Scale error not to exceed	0.2°C

Immersion – a swelling is to be provided in the stem of the stem of the oil cup thermometer to ensure that the thermometer can be fitted in its brass collar so that the distance from the top of the collar to the bottom of the bulb is 61 ± 1.5 mm.

APPENDIX



METHOD OF TEST FOR COMBUSTIBILITY

Scope

1. The method describes a procedure for determining if the product when heated under the conditions of test and exposed to an external source of flame applied in a standard manner supports combustion.

Principle of the method

2. - (1) A block of aluminium alloy, or other non-rusting metal of suitable heat conductivity, with a concave depression (called the well) is heated to the required temperature. A standard source of flame capable of being swivelled over the centre of the well and at a given distance from it is attached to the metal block.

(2) Two millilitres of product under test are transferred to the well and its combustibility characteristics are noted in relation to the standard flame.

Apparatus

3. - (1) A combustibility tester consisting of an aluminium alloy or non-rusting metal block of suitable heat conductivity fitted with a concave depression or well. The metal block has a thermometer embedded in it. A small gas jet on a swivel is attached to the metal block. The exact dimensions of the metal block, and its well, the gas jet and its positioning, and the embedded thermometer are shown on the drawing set out in the Appendix to this Schedule and are specified in Table 1 to this Schedule.

(2) A simple gauge to check height of gas jet above the top of the well.

(3) The thermometer in the metal block shall be a Celsius thermometer conforming to the dimensions and tolerances given in Table 2 to this Schedule.

(4) A hot plate fitted with a temperature controlling device or other means of heating the metal block.

(5) A stop watch or other suitable timing device.

(6) A graduated pipette or hypodermic syringe capable of delivering two millilitres to an accuracy of ± 0.1 ml.

Sampling

4. - (1) The sample shall be representative of the material being tested and shall be kept prior to test in an airtight container.

(2) Because of the possibility of loss of volatile constituents the sample shall receive only the minimum treatment to ensure uniformity. After removing a portion for test the sample container shall be immediately closed tightly to ensure that no volatile flammable components escape from the container.

Procedure

5. - (1) Set up the apparatus in a draught free area. Place the metal block on the hot plate fitted with a temperature controlling device or heat the metal block by other suitable means so that its temperature is maintained at 50°C (within an accuracy of $-0+5^{\circ}\text{C}$) or to the corrected temperature allowing for difference of barometric pressure from the standard (760 mm of mercury or 1013 millibar) by raising the test temperature for a higher or lowering the test temperature for a lower pressure at the rate of 1°C for each 30 mm of mercury (40 millibar) difference. Ensure that the top of the metal block is exactly level. Use a gauge to check that the jet is 2.2 mm above top of the well.

(2) Using the pipette or graduated hypodermic syringe withdraw from the sample container at least 2 ml. of the test material and transfer 2 ml. ± 0.1 ml. of it to the well of the combustibility tester.

(3) Immediately start the timing device.

(4) Light the test flame with the jet in the “off” position away from the well. Adjust the size of the flame so that it is spherical and approximately 4 mm in diameter. The size of the flame is matched to a 4 mm diameter circle engraved on the surface of the combustibility tester.

(5) After exactly one minute (at this time the test-portion will be deemed to have reached the test temperature as indicated by the thermometer embedded in the metal Block) swing the test flame into a position exactly central over the well. Hold it in this position for exactly 15 seconds and then return it to the “off” position.

Interpretation of observation

6. For the purpose of these Regulations a product will be deemed to support combustion if, when tested in the manner set out above, either: -
- (a) when the flame is over the well the product ignites and the combustion is sustained for more than 15 seconds when the flame is removed, or
 - (b) when the flame is in the “off” position the product flashes and burns.

Report of Test

7. The test report should include the following information: -
- (1) The type and identification of the material under test.
 - (2) The test temperature in °C and barometric pressure in mm of mercury or millibar.
 - (3) A statement as to whether the products support combustion as defined in paragraph 6 of this Schedule.
 - (4) The date of the test.

Table 1

DIMENSIONS OF COMBUSTIBILITY TESTER

(a) Sample block details	Dimensions in mm	
Diameter of block	62	±0.5
Height of block	36.5	±1.5
Diameter of flange	95	±0.5
Flange thickness	3.0	approx.
Height of well 'lip' above flange	0.8	±0.2
Diameter of well 'lip'	41.0	approx.
Spherical radius of well	33.25	±0.25
Depth of well	6.3	±0.1
Distance from top of block to thermometer hole	16.5	±0.5
Thermometer hole diameter	7.0	approx.
(b) Test gas jet details	Dimensions in mm	
Outside diameter of jet	3.5	±0.5
Jet end tapered to	2.0	±0.3
Bore of jet	0.7	±0.1
Length of jet (from centre of axis to tip)	36.1	±0.1
Distance of axis from centre of well	38.1	±0.1
Flame gauge ring diameter	4.0	approx.
'Swing' of jet (from stop to stop)	90°	±1°
Height of jet above top of well 'lip'	2.2	approx.
Note: Adjust with suitable gauge		

Table 2

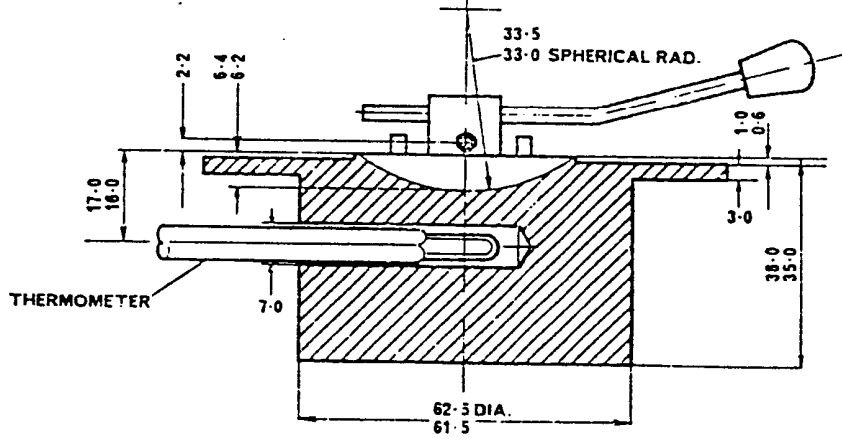
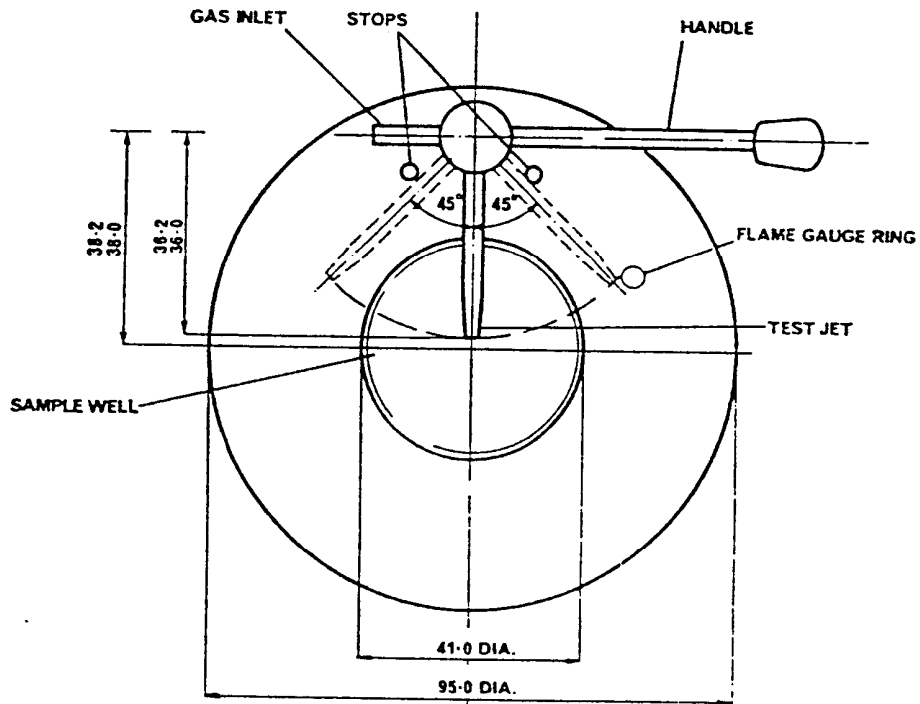
THERMOMETER SPECIFICATION

Type: Mercury in glass, nitrogen filled for horizontal operation

Range	0°C – 110°C
Graduation	Each degree C
Overall length	200 mm ± 5
Stem diameter	6.5 mm ± 0.5
Bulb shape	Elongated
Bulb diameter	5.0 mm ± 1.0
Length of graduated portion	125 mm ± 10.0
Distance, bottom of bulb to 0°C mark	50 mm ± 2.0
Longer lines at each	10°C
Figured at each	10°C
Top finish	Plain
Scale error not to exceed	0.5°C

NOTE: Seal thermometer in block with suitable thermal compound.

APPENDIX



ALL DIMENSIONS IN MILLIMETRES