

**CHAPTER 347.**

**PETROLEUM.**

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## CHAPTER 347.

## PETROLEUM.

7 of 1930.  
19 of 1932.  
44 of 1952.

**An Ordinance to regulate the importation, storage and sale of petroleum.**

[22ND MARCH, 1930.]

Short title.

1. This Ordinance may be cited as the Petroleum Ordinance.

Interpretation.

2. (1) In this Ordinance—

44 of 1952,  
s. 2.

“ dangerous petroleum ” means petroleum having a flash point which is less than eighty-five degrees Fahrenheit ascertained as prescribed in section 13 of this Ordinance, methylated spirits within the meaning of the Spirits Ordinance, ether, carbon bisulphide or any product or mixture containing methylated spirits, ether or carbon bisulphide, and carbide of calcium;

Cap. 319.

“ licensed building ” means any building, tank with pipe lines or other erection in respect of which the Director of Public Works has issued a licence for the storage of petroleum under subsection (3) of section 6 of this Ordinance;

“ ordinary petroleum ” means petroleum other than dangerous petroleum;

“ petroleum ” includes crude petroleum, oil made from petroleum or from coal, shale, peat or other bituminous substance or any other product of petroleum, methylated spirits within the meaning of the Spirits Ordinance, ether, carbon bisulphide and any product or mixture containing any of them, and carbide of calcium; and

“ warehouse ” means any place or building provided by the Governor for the storage of petroleum under subsection (1) of section 6 of this Ordinance.

(2) The Governor in Council may, by order published in the Gazette, declare that the provisions of this Ordinance relating to petroleum, or any of them, shall apply to such other inflammable liquid or substance as may be specified in such order, subject to any modifications as may be prescribed therein.

Any such order may be varied or revoked by any subsequent order.

## IMPORTATION.

3. (1) The master of any craft with a cargo consisting wholly or in part of petroleum, shall from the time such craft enters any port in the Colony, or from the time any petroleum is placed on board of such craft until it goes out to sea or until the petroleum is removed from on board, conform to such directions in respect of the place at which it is to be moored, loaded or discharged as may be issued generally for all such craft or specially for any such craft by the Harbour Master, Comptroller of Customs or other proper officer of the port.

Mooring,  
loading and  
discharging  
of craft with  
petroleum on  
board.

(2) If any such craft is moored, loaded or discharged at any place in contravention of any such directions, the owner and master of such craft shall each be liable to a penalty not exceeding two hundred dollars, and it shall be lawful for the Harbour Master, Comptroller of Customs or other officer as aforesaid to cause such craft to be removed at the expense of the owner or master thereof, to such place as may be in conformity with such directions, and all expenses incurred in such removal may be sued for and recovered by the Harbour Master, Comptroller of Customs or other officer against such owner or master.

(3) This section shall not apply to petroleum contained in the supply tanks or bunkers of craft the motive power of which is obtained from petroleum.

4. (1) Subject to the provisions of subsections (2) and (3) of this section, all petroleum imported into the Colony shall, on being landed, be removed immediately by the importer from the wharf and shall be stored in a warehouse or licensed building:

Removal  
of petroleum  
after landing  
44 of 1952,  
s. 3.

Provided that this section shall not apply to petroleum landed for immediate transit from the port of arrival to other places in the Colony, or to petroleum transferred to another vessel.

(2) Ordinary petroleum imported into the Colony and having a flash point exceeding one hundred and fifty degrees Fahrenheit shall, on being landed, be removed immediately by the importer from the wharf and shall be stored in a building licensed for storing such petroleum.

44 of 1952,  
s. 3.

(3) The Comptroller of Customs may, whenever ordinary petroleum having a flash point exceeding one hundred and fifty degrees Fahrenheit is discharged after three of the clock in the afternoon, allow such ordinary petroleum to remain on the wharf at which it was discharged until the morning of the next day, when it shall be immediately removed and stored as in this section provided.

44 of 1952,  
s. 3.

44 of 1952,  
s. 3.

(4) Any person contravening any of the provisions of this section shall be liable on summary conviction to a penalty not exceeding one hundred dollars.

Conditions  
of keeping  
petroleum.

44 of 1952,  
s. 4.

5. (1) Except as otherwise provided in this Ordinance, no person shall keep—

(a) carbide of calcium in any quantity exceeding five pounds; or

(b) dangerous petroleum (other than carbide of calcium) in any quantity exceeding one gallon;

(c) ordinary petroleum in any quantity exceeding one hundred gallons;

in any place other than a warehouse or licensed building:

Provided that the Director of Public Works may authorise any fit and proper person in writing to keep for sale in any store, shop or other building and in such place as may be approved by him, ordinary petroleum in any quantity not exceeding one thousand five hundred gallons.

44 of 1952,  
s. 4.

(2) Any person who keeps dangerous petroleum or ordinary petroleum otherwise than in accordance with the provisions of this section, and the occupier of any premises wherein such petroleum is so kept, shall be guilty of an offence and shall be liable on summary conviction to a penalty not exceeding one hundred dollars and the petroleum shall be forfeited.

44 of 1952,  
s. 4.

(3) This section shall not apply to—

(a) petroleum for the time being contained in the tank of any motor vehicle, motor vessel or boat;

(b) petroleum being transported in accordance with the provisions of this Ordinance and any regulations made thereunder; or

(c) methylated spirits in any quantity not exceeding four gallons where kept by a registered chemist and druggist.

#### STORAGE.

Petroleum  
warehouses  
and licensed  
buildings.

6. (1) The Governor may from time to time provide a warehouse in the City of Georgetown, the town of New Amsterdam, and any other place or places for the storage of petroleum and may provide a separate warehouse for the storage of dangerous petroleum.

(2) Each warehouse shall be under the charge of the Comptroller of Customs or such other officer as the Governor may from time to time appoint.

(3) The Director of Public Works may issue to any person applying therefor a licence authorising him to use any building, tank with pipe-lines, or other erection for the storage of petroleum, and such licence shall specify the time it shall remain in force, and the maximum quantity and kind or kinds of petroleum that may be stored within such building, tank or other erection. The Director of Public Works may at any time renew such licence.

19 of 1932,  
s. 5.

(4) The Director of Public Works may for any cause which he may deem sufficient refuse to issue a licence, or revoke or suspend any licence already issued.

19 of 1932,  
s. 5.

(5) No licence shall be transferred without the previous consent in writing of the Director of Public Works.

19 of 1932,  
s. 5.

(6) A licensed building shall be under the charge of the licensee, who will be held responsible for the carrying out in relation thereto of the provisions of this Ordinance and the regulations made thereunder.

(7) For every original licence so issued a fee of five dollars shall be paid.

19 of 1932,  
s. 5.

7. (1) Each lot of dangerous petroleum or ordinary petroleum stored in a warehouse or licensed building shall be stored separately, and shall have a distinguishing mark and be so packed that an account may be taken of the same as often as may be deemed necessary or expedient.

Marking and  
packing of  
petroleum.  
19 of 1932,  
s. 6.

(2) The owner of petroleum in a warehouse, or his agent, shall have free access to the warehouse during such hours as the warehouse may be open for the receipt or delivery of petroleum, to examine and inspect the same, and subject to any regulations made under section 26 hereof, to take all necessary precautions for preventing leakage and waste.

8. (1) Petroleum shall not be received into or delivered from any licensed building except between the hours of six o'clock in the forenoon and six o'clock in the afternoon, except with the permission of the person in charge of the nearest police station:

Hours of  
delivery.  
19 of 1932,  
s. 7.

Provided that this subsection shall not apply to petroleum required for the *bona fide* locomotion of vehicles and delivered by means of a sealed pipe-line, so controlled that it is unnecessary to open the enclosure in which the storage receptacles are situated.

(2) If any petroleum is received or delivered contrary to this section, the licensee of such building shall be liable to a penalty not exceeding five hundred dollars.

Prohibition of naked light, etc., or smoking in any warehouse or licensed building.  
19 of 1932, s. 8.

9. (1) No lighted candle, lamp, lantern or naked light of any kind, no match, no article of an explosive or highly inflammable nature, other than petroleum, shall under any pretence or for any purpose whatever be taken into or dangerously near any licensed building, warehouse, or vehicle used for the hawking of petroleum; and no wire as a fixture or as a wandering lead used as a conductor for electricity shall be so taken into any licensed building or warehouse.

(2) No person shall under any circumstances smoke in or dangerously near any licensed building, warehouse, or vehicle used for the hawking of petroleum.

(3) Any person contravening any of the provisions of this section shall be liable to a fine not exceeding five hundred dollars or to imprisonment for a period not exceeding six months.

Use of petroleum in machines.  
19 of 1932, s. 9.

10. (1) No person shall use a machine for the manufacture of gas from petroleum or which uses petroleum as fuel unless and until the Director of Public Works has issued to him on application therefor a licence to have upon the premises described in such licence any quantity of petroleum, not exceeding a limit to be specified in the licence to be used in connection with such machine. Such licence shall not be granted unless it appears to the Director of Public Works that the use of such machine is unattended with material risk or danger, and that the premises in which such machine is kept are so situated and constructed as to be consistent with public safety.

(2) Every such licence shall contain a full description of the machine intended to be used and of the premises where it is situated, and shall specify the time during which the licence is to be in force.

(3) There may be annexed to any such licence any conditions as to the time of use of the machine, the mode or manner in which the petroleum is to be stored, and any other matters which the Director of Public Works may think necessary for diminishing the risk from explosion or fire, and the premises so licensed shall be subject to similar control and inspection as any licensed building under this Ordinance.

(4) Any licensee who violates any condition of a licence issued under this section may have his licence forfeited, and shall be liable to a penalty not exceeding two hundred and fifty dollars:

Provided that in any proceedings hereunder in computing the quantity of petroleum which the licensee is authorised by the

19 of 1932, s. 9.

licence to have and use upon his premises, the quantity contained in the machine in respect of which the licence is granted shall be excluded from the computation, unless the quantity of petroleum contained in any such machine exceeds the limit specified in the licence.

### HAWKING.

11. (1) Any person who is licensed in pursuance of subsection (3) of section 6 of this Ordinance may, subject to the provisions of this Ordinance and any regulations made thereunder and any enactments for the time being in force with respect to hawkers and pedlars, hawk such petroleum by himself or his servants.

Permission to hawk petroleum.

(2) The petroleum shall be stored in the licensed building between the hours of six o'clock in the afternoon of one day and six o'clock in the forenoon of the following day and also when the petroleum is not in the course of being hawked.

(3) Any person contravening any of the provisions of this section shall be liable to a penalty not exceeding one hundred dollars.

### TESTING OF PETROLEUM.

12. (1) The Government Analyst and every assistant government analyst are hereby authorised to test petroleum.

Persons authorised to test petroleum.

(2) The Governor may in addition appoint fit and proper persons as authorised to test petroleum and may at any time revoke any such appointment and shall cause to be published in the Gazette notice of every such appointment and revocation.

13. (1) The temperature at which petroleum gives off inflammable vapour shall, for the purposes of this Ordinance, be ascertained—

Mode of determining temperature.

(a) in the manner set forth in the second schedule to this Ordinance; or

Second schedule.

(b) in such manner as may from time to time be prescribed by the Governor by order in council to be published in the Gazette.

(2) A model of any apparatus to be used in such ascertainment shall be kept at the Government Laboratory at Georgetown.

Notification of arrival of petroleum and procuring of samples for testing

14. As soon as the Comptroller of Customs ascertains, either from the ship's manifest or in any other manner, that any vessel entering any port in this Colony, is laden or partly laden with petroleum for importation, he shall cause not less than three samples to be taken of each brand or quality of such petroleum, and shall transmit such samples to a person authorised to test petroleum in order that the same may be tested.

Testing and certifying of samples.

19 of 1932, s. 11.

First schedule.

15. Within twenty-four hours (Sundays and public holidays excepted) of the receipt of such samples, the person authorised shall test the same, and shall certify in duplicate to the Comptroller of Customs, in the form contained in the first schedule hereto, whether the samples so tested by him consist of dangerous petroleum or ordinary petroleum, as the case may be.

Effect of certificate as to kind of petroleum.

19 of 1932, s. 12.

16. The Comptroller of Customs shall when requested to do so, forward one copy of the certificate to the owner of the petroleum from which the samples have been taken, and such petroleum shall be considered to all intents and purposes, to be dangerous petroleum or ordinary petroleum, as the case may be, unless a certificate to the contrary is obtained later or the contrary is proved in any legal proceedings.

Testing and certifying of petroleum in warehouse or licensed building.

19 of 1932, s. 13.

First schedule.

17. (1) It shall be lawful for the officer in charge of a petroleum warehouse to cause samples to be taken of any petroleum kept in such warehouse, and for any officer of Customs, \*district commissioner, or member of the police force or for any other person appointed for that purpose by the Governor, at any reasonable time during the day to enter any other premises and to inspect and take samples of any petroleum kept on such premises or offered or exposed for sale therein and to submit such samples to a person authorised to test petroleum.

(2) Where a sample of petroleum is taken under this section, the person taking the sample shall then and there divide it into three parts and place each part in a separate receptacle marked and sealed.

(3) He shall then deliver or cause to be delivered one of such receptacles to the owner of the petroleum and another to a person authorised to test petroleum and shall keep the third for future comparison and production in court, if necessary.

(4) On receipt of any such receptacle the person authorised shall test the petroleum in the receptacle and shall certify in duplicate in the form in the first schedule to this Ordinance

\*For the meaning of "district commissioner" in this section, see Cap. 56, s. 9 (2).



whether such petroleum is dangerous petroleum or ordinary petroleum. The officer in charge of the warehouse or other person as aforesaid shall forward one copy of the certificate to the owner of the petroleum or the licensee of the building from which such samples have been taken, and such petroleum shall be considered to all intents and purposes to be dangerous petroleum or ordinary petroleum, as the case may be.

18. (1) In any proceedings before a magistrate under this Ordinance a certificate in the form in the first schedule to this Ordinance purporting to be signed by any person authorised to test petroleum shall be receivable as *prima facie* evidence of any matter or thing therein stated.

Certificate of evidence.  
First schedule.

(2) If the person who has tested the petroleum is called as a witness in any such proceedings, the party calling him shall unless the magistrate otherwise expressly orders, be liable to pay all costs occasioned by his having been so called.

(3) In any such proceedings the part of the petroleum retained by the person who took the samples shall be produced in court.

#### MISCELLANEOUS PROVISIONS.

19. If any petroleum is imported, kept, offered or exposed for sale contrary to the provisions of this Ordinance or any regulations made thereunder or the conditions of any licence issued under this Ordinance, the same shall be liable to be seized by any officer of customs, \*district commissioner, or member of the police force and, upon proof of such importation, keeping or offering or exposing for sale, may be adjudged to be forfeited.

Seizure of petroleum kept in contravention of the Ordinance.

20. (1) It shall be lawful for any magistrate or justice of the peace on reasonable cause being assigned upon oath before him to issue a warrant under his hand for searching in the day time any house, storehouse, warehouse, shop, cellar, yard, wharf, or other place in which petroleum is suspected to be kept contrary to this Ordinance.

Issuing of warrant for searching house, etc., in which petroleum is suspected to be unlawfully kept.

(2) All petroleum found to be kept contrary to this Ordinance, and also the vessels or other receptacles in which the same is kept, shall be immediately seized by the person finding the same,

\*For the meaning of "district commissioner" in this section, see Cap. 56, s. 9 (2).

who, unless the Governor shall otherwise direct, shall with all convenient speed after the seizure, remove such petroleum and the vessels and other receptacles in which it is contained to a warehouse or licensed building, and may detain such petroleum and such vessels and other receptacles until it is adjudged whether the same shall be forfeited:

Provided that proceedings for forfeiture shall be commenced within seven days after the seizure.

(3) Any person so seizing or detaining petroleum, vessels or receptacles shall not be liable to any action for such seizure or detention, or for any loss or damage which may be occasioned thereby otherwise than through his wilful act or neglect.

Forfeiture of petroleum where quantity in excess is kept.

**21.** If there is stored in any place a greater quantity of petroleum than the quantity permitted by this Ordinance or by any licence issued under this Ordinance to be kept in such place, the whole of the petroleum in such place may be forfeited, and the person occupying or using such place or the licensee, if the place be a licensed building, shall be guilty of a contravention of this section and shall be liable to a penalty not exceeding two hundred dollars.

Disposal of forfeited petroleum.

**22.** Any petroleum forfeited under this Ordinance, together with the vessels or other receptacles containing the same, shall be dealt with as the Governor may direct.

Penalty for assault on persons acting under this Ordinance.

**23.** Every person who assaults, molests, or obstructs any person acting under this Ordinance, shall be liable to a penalty not exceeding one hundred dollars.

Protection of person acting under the Ordinance.  
Cap. 18.

**24.** Every person acting under the provisions of this Ordinance or of any regulations made thereunder shall be entitled to the protection afforded by the Justices Protection Ordinance.

Procedure.

**25.** All prosecutions and proceedings for offences, forfeitures and penalties under this Ordinance or any regulations made thereunder, may be instituted under the Summary Jurisdiction Ordinances by any Harbour Master, officer of customs, \*district commissioner, member of police force, or other person appointed by the Governor under this Ordinance.

\*For the meaning of "district commissioner" in this section, see Cap. 56, s. 9 (2).

26. (1) The Governor in Council may make regulations for any of the purposes of this Ordinance, and in particular with relation to—

Power to make regulations.

(a) the importation, landing, receiving, depositing, guarding, delivery, hawking and removing from one place to any other place of petroleum;

(b) the conditions upon which the persons to whom and the premises for which any licence under this Ordinance may be issued;

(c) the general management and regulation of warehouses and licensed buildings and oil engines, and the duties and conduct of any person or persons in charge thereof or employed in connection therewith;

(d) the kind and quantity of petroleum that may be kept in any licensed building; specifications for and the nature of the buildings in which petroleum may be stored and the surroundings and situation of the premises on which such buildings stand, and the nature, size and capacity of the receptacles, including tanks with pipe-lines, which petroleum may be stored or transported in, and the due and proper inspection of all buildings, premises and receptacles;

(e) the sale of petroleum, whether by wholesale or retail, including the quantity or amount permitted to be sold, the packages in which it shall be contained and the persons to whom it may be sold.

(2) There may be annexed to the breach of any regulation a penalty not exceeding two hundred and fifty dollars.

FIRST SCHEDULE.

(As substituted by 19 of 1932.)

ss. 15, 17 and 18.

CERTIFICATE OF TEST OF PETROLEUM.

I hereby certify that I have tested the samples marked Nos..... forwarded to me to be tested at..... on the ..... day of..... 19....., and that such samples consist of dangerous petroleum within the meaning of the Petroleum Ordinance. do not consist of ordinary petroleum

Dated this.....day of.....19.....

(Signed).....  
Government Analyst, or Assistant  
Government Analyst or other person  
authorised to test Petroleum under  
section 12 (2) of the Petroleum  
Ordinance,

s. 13.

## SECOND SCHEDULE.

TEST APPARATUS TO BE USED AND MODE OF TESTING PETROLEUM THEREWITH SO AS TO ASCERTAIN THE TEMPERATURE AT WHICH IT WILL GIVE OFF INFLAMMABLE VAPOUR.

(1).—FOR FLASHPOINTS NOT ABOVE 120° FAHRENHEIT.

## PART I.

## SPECIFICATION OF THE TEST APPARATUS.

*General.*

The apparatus to be employed shall be the Abel Petroleum Testing Apparatus or the Abel apparatus modified by having an oil cup provided with a stirrer. It shall be constructed to the dimensions herein specified within the limits of accuracy prescribed by the tolerances set forth below.

*The Oil Cup.*

The oil cup consists of a cylindrical vessel open at the top and fitted on the outside with a flat circular flange projecting at right angles.

Within the cup, fixed through the wall and silver soldered or brazed in place, there is a gauge consisting of a piece of wire bent upwards and terminating in a point.

Material. Brass or gun-metal.

	Dimension.	Tolerance.
Cup, wall and bottom thickness	17 I.W.G.	—
„ internal diameter	2"	± 0.05"
„ internal depth	2.2"	± 0.05"
Flange, thickness	17 I.W.G.	—
„ width	0.5"	± 0.05"
„ distance of upper side from top edge of cup	0.375"	± 0.05"
Gauge, thickness, not less than	10 I.W.G.	—
„ distance of point from level of upper edge of cup	0.7"	± 0.005"

*The Cover.*

The cup is provided with a close-fitting cover with a downward projecting rim barely reaching the flange on the cup. The downward projecting rim is made solid with the top or silver soldered or brazed in place. Upon the cover are mounted a thermometer socket, trunnions to support an oil-test lamp, a pair of guides in which a slide moves, and a white bead. The top of the cover is pierced by three rectangular holes symmetrically placed on a diameter, one in the centre and the other two as close as practicable to the inner sides of the cover-rim and opposite each other. These three holes are covered or uncovered by means of a slide moving in suitably disposed guides. The slide has two perforations, one corresponding in all particulars to the centre hole in the cover and the other to one of the holes at the side. The movement of the slide is restricted by suitable stops, and its length and the disposition of the holes are such that, at the outer extremity of the movement of the slide, the holes in the cover are simultaneously just completely opened and at the inner extremity of the movement of the slide they are completely closed.

The trunnions supporting the test-lamp are fixed on the top of the guides and the lamp is mounted in the trunnions so that it is free to oscillate. The

lamp is provided with a jet to contain a wick and is so arranged that when the slide is moved so as to uncover the holes, the oscillating lamp is caught by a pin fixed in the slide and tilted over the central hole in such a way that the lower edge of the cover bisects the circle formed by the bore of the jet when in the lowest position. The flame then occupies a central position within the hole in both directions.

A suitably mounted gas-jet may be substituted for the lamp.

The thermometer socket is in the form of a split tube, mounted on a diameter at right angles to the diameter through the centres of the holes, and fitted at such an angle as to bring the bulb of the thermometer, when in place, vertically below the centre of the cover and at the correct distance from it.

A white bead, the dimensions of which represent the size of test flame to be used, is mounted in a visible position on the cover.

Materials. All parts excepting bead, brass or gun-metal. Bead, ivory or other suitable material.

	Dimension.	Tolerance.
Cover, thickness	0.05"	+ 0.015"
„ central hole, length (in direction of slide)	0.5"	+ 0.005"
„ width	0.4"	± 0.005"
„ peripheral holes length (in direction of slide)	0.2"	± 0.005"
„ width	0.3"	± 0.005"
Slide, thickness	20 I. W. G.	—
„ width of upper surface	0.5"	+ 0.01"
Lamp, overall length of jet	Approx. 0.6"	(excess only)
„ bore of jet at end	0.0625"	To suit the requirements for the position of jet when tilted
Bead, diameter	0.15"	± 0.005"
Thermometer socket—		± 0.01"
Internal diameter	0.6"	± 0.01"
Length of short side measured from under surface of cover	Approx. 0.5"	—
Length of long side measured from under surface of cover	Approx. 0.75"	—
Distance of centre of socket from centre of cover measured on the underside	Approx. 0.7"	—
These dimensions are subject to the correct placing of the thermometer when in position.		
Vertical depth of lowest part of thermometer below centre of under-side of cover	1.5"	± 0.1"

*Cover Fitted with Stirrer.*

Provision may be made in the cover for the reception of a stirrer which projects into the oil cup, for use with viscous materials only.

A bush is mounted on the cover in a position diametrically opposite the thermometer mounting and its length is such and it is set at such an angle that the stirrer rod clears the oil-level gauge and the blades operate below the level of and without fouling the thermometer bulb. The bush is placed as near as practicable to the outer edge of the cover,

The stirrer consists of a round stem having four blades or vanes silver soldered in place at one end. A collar is fixed on the stem so that when the stem is inserted into the bush from below, it is arrested at a position such that the correct length protrudes into the oil cup. The top end of the stem is reduced and screwed.

A long sleeve having an internally screwed, knurled knob soldered to its upper end, is passed over the upper end of the stem and screwed home. The length of the sleeve is such that a flat-faced collar at its lower end just comes into contact with the upper end of the bush, leaving the stirrer free to rotate without appreciable vertical play.

A flat-headed cylindrical plug is provided for insertion in the bush when the stirrer is not in use.

Material. Brass or gun-metal.

	Dimension.	Tolerance.
Stem, length, overall ... ..	4"	$\pm 0.1''$
„ „ lower end to point of attachment of blades ... ..	Approx. 0.1"	—
„ „ lower end to upper surface of collar ... ..	1.9"	$\pm 0.1''$
„ „ upper surface of collar to lower end of thread ... ..	2"	$\pm 0.1''$
„ diameter ... ..	Approx. 0.125"	—
„ „ of collar ... ..	Approx. 0.25"	—
„ thread ... ..	7 B.A.	—
Blades, thickness ... ..	17 I.W.G.	—
„ length, excluding root ... ..	0.5"	$\pm 0.01''$
„ breadth (all corners of blades rounded) ... ..	5/16" (0.3125")	$\pm 0.01''$
„ angle ... ..	Approx. 45°	—
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 collar ... ..	Approx. 0.25"	—

#### *Heating Vessel.*

The heating vessel or bath consists of two flat-bottomed cylindrical copper vessels placed coaxially one inside the other and soldered at their tops to a flat copper ring, greater in outside diameter than the larger vessel and of smaller inside diameter than the smaller vessel. The space between the two vessels is thus totally enclosed and is used as a water jacket.

An ebonite or fibre ring of right-angle section is fitted into the hole in the centre of the flat ring forming the top of the bath and, when the apparatus is in use, the oil cup fits into, and its flange rests upon, this ebonite or fibre ring so that the oil cup is centrally disposed within the heating vessel. The ebonite or fibre ring is secured in place by means of six small screws having their heads sunk below the surface of the ring, to avoid metallic contact between the bath and the oil cup.

A split socket, similar to that on the cover of the oil cup, but set vertically, allows a thermometer to be inserted into the water-space. A funnel and overflow pipe also communicate with the water-space through the top plate and two loop handles are provided thereon.

	Dimension.	Tolerance.
Inner vessel—		
Thickness ... ..	24 I.W.G.	—
Internal diameter ... ..	3"	± 0.05"
Internal depth ... ..	2.5"	± 0.05"
Outer vessel—		
Thickness, not less than ... ..	24 I.W.G.	—
Internal diameter ... ..	5.5"	± 0.1"
Internal depth ... ..	5.75"	± 0.1"
Top plate—		
Thickness, not less than ... ..	20 I.W.G.	—
Outer flange projection ... ..	0.375"	± 0.1"
Diameter of central hole ... ..	To suit ebonite or fibre ring. Clearance not to exceed 0.1"	—
Ebonite or fibre ring—		
Internal diameter ... ..	Easy fit on oil cup	—
External diameter of flange ... ..	2.75"	± 0.02"
Overall depth of spigot ... ..	0.25"	± 0.02"
Thickness, flange and spigot ... ..	0.08"	± 0.005"
Screws, C.S. ... ..	8 B.A. × 0.15"	—
Thermometer socket—		
Internal diameter ... ..	0.6"	± 0.01"
Height from top of plate ... ..	0.75"	± 0.05"

The bath rests upon a cast-iron tripod stand, to the ring of which is attached a cylindrical copper jacket not less than 24 I.W.G. flanged inwards at the top, and of such dimensions that the bath, while resting firmly on the iron ring, just touches with its outward projecting flange the inward-turned flange of the jacket. Two handles are provided on the outer jacket.

Diameter of the outer jacket 6.5 inches ± 0.1 inch.

*Spirit Lamp.*

A spirit lamp is provided for raising the temperature of the water bath, but any other means approved by the Government Analyst may be employed for this purpose.

*Thermometers.*

Two thermometers are provided with the apparatus, the one for ascertaining the temperature of the bath, the other for determining the flashing point.

*Oil Cup Thermometer.*

Type ... ..	Mercury in glass, nitrogen filled, graduated on the stem, enamel back.
Length ... ..	Approximately 9 inches.
Stem ... ..	Diameter 0.24 to 0.28 inch.
Bulb ... ..	Spherical: made of a normal glass approved by the Government Analyst. Diameter, 0.35 inch ± 0.05 inch.
Range ... ..	50°F. to 150°F. with expansion chamber. Distance from the bottom of the bulb to the 50° line 2.75 inches to 3.15 inches. Distance from the 50° line to the 150° line not less than 4.75 inches.

Immersion...	...	A swelling is made in the stem to ensure that the thermometer shall be fixed in its brass collar so that the distance from the top of the collar to the bottom of the bulb is 2.4 inch $\pm$ 0.05 inch.
Graduation	...	Scale graduated to 1°F. divisions. Every 5° and every 10° to be indicated by longer lines. Figured at every 10° in full.
Marking	...	“ Abel Oil Cup ”: Identification number “ Fahrenheit ”: Maker’s or Vendor’s name or trade mark.

*Water Bath Thermometer.*

Type	...	Mercury in glass, nitrogen filled, graduated on the stem, enamel back.
Length	...	Approximately 9 inches.
Stem	...	Diameter, 0.24 inch to 0.28 inch.
Bulb	...	Cylindrical: made of a normal glass approved by the Government Analyst. Length approximately 0.8 inch. Diameter not to exceed the diameter of the stem.
Range	...	90°F. to 190°F. with expansion chamber. Distance from the bottom of the bulb to the 90° line 3.95 inches to 4.35 inches. Distance from the 90° line to the 190° line not less than 3.55 inches.
Immersion...	...	A swelling is made in the stem to ensure that the thermometer shall be fixed in its brass collar so that the distance from the top of the collar to the bottom of the bulb is 3.5 inches $\pm$ 0.1 inch.
Graduation	...	Scale graduated in 1°F. divisions. Every 5° and 10° to be indicated by longer lines. Figured at every 10° in full.
Marking	...	“ Abel Water Bath ”: Identification number “ Fahrenheit ”: Maker’s or Vendor’s name or trade mark.

The brass collar of the thermometer is in each case of the following dimensions—

Outside diameter	...	push fit in socket.
Thickness of tube	...	22 I.W.G.
Thickness of flange	...	0.1 inch, $\pm$ 0.001 inch.

NOTE.—A model apparatus is deposited at the Government Laboratory.

PART II.

*Method of Applying the Flashing Test.*

1. The test apparatus shall be placed for use in a position where it is not exposed to currents of air or draughts.

2. The heating vessel or water-bath shall be filled by pouring water into the funnel until it begins to flow out at the spout of the vessel. The temperature of the water at the beginning of the test shall be 130° Fahrenheit and no heat shall be applied to the water-bath during the test. When a test has been completed and it is desired to make another test the water-bath shall be again raised to 130°F. which may conveniently be done while the petroleum cup is being emptied, cooled and refilled with a fresh sample to be tested. The next test is then proceeded with.

3. If an oil test-lamp is being used it shall be prepared by fitting it with a piece of flat plaited candle-wick, and filling it with colza or rape-oil up to the



lower edge of the opening of the spout or wick tube. The lamp shall be trimmed so that when lighted it gives a flame of about 0.15 of an inch diameter, and this size of flame, which is represented by the projecting white bead on the cover of the oil-cup is readily maintained by simple manipulation from time to time with a small wire trimmer. A gas test-flame may be employed and, if so, the size of the jet of flame shall be adjusted to the size laid down above.

4. The bath having been raised to the proper temperature, the cup shall be placed on a level surface in a good light, and the oil to be tested shall be poured into it, until the level of the liquid just reaches the point of the gauge which is fixed in the cup. Before a test is begun the temperature of the oil shall be determined and shall be brought to approximately 60°F. The cover, with the side closed, shall then be put on to the cup and pressed down so that its edge rests on the rim of the cup, and the cup shall be so placed into the bath or heating vessel, every care being taken to avoid wetting the sides of the cup with the oil. The thermometer in the lid of the cup has been adjusted so as to have the correct immersion when the brass collar of the thermometer is properly seated, and its position shall not in any circumstances be altered. When the cup has been placed in the proper position, the scale of the thermometer faces the operator.

5. The test-lamp shall then be placed in position upon the lid of the cup. When the temperature has reached 66°F. the operation of testing shall be begun, the test flame being applied once for every rise of one degree, in the following manner—

The slide shall be slowly drawn open while a metronome, set at 75 to 80 beats per minute, beats three times and shall be closed during the fourth beat. A pendulum of 24 inches effective length may be used in place of the metronome, counting one beat from one extremity of the swing to the other.

## (2) FOR FLASHPOINTS ABOVE 120° FAHRENHEIT.

The apparatus to be employed shall be the Pensky-Martens testing apparatus, and shall include the following major parts:—

*Cup.* The cup of the Institution of Petroleum Technologists standard Pensky-Martens flash tester shall be made of brass and shall satisfy the following dimensional specifications—

Dimensions.	Inches.	
	Normal.	Tolerances.
Inside diameter below filling mark ... ..	2.000	± 0.050
Difference, inside and outside diameters below filling mark ... ..	0.125	± 0.010
Inside height ... ..	2.200	± 0.050
Thickness of bottom ... ..	0.095	± 0.025
Distance from rim to filling mark ... ..	0.860	± 0.015
Distance lower service flange to bottom of cup ...	1.795	± 0.015

The inside of the cup may be turned to a slightly larger diameter above the filling mark and the outside may be tapered above the flange, but the wall thickness at the upper edge shall be not less than 0.04 in. (0.1 cm.). The flange should be approximately 0.5 in. (1.27 cm.) wide and approximately 0.125 in. (0.32 cm.) thick. It shall be equipped with devices for locating the position of the lid on the cup and the cup centrally in the stove. A handle, attached permanently to the flange of the cup, is a desirable accessory.

*Stirring Device.*—The lid shall be equipped with a stirring device consisting of a vertical steel shaft, not less than 0.1 in. (0.25 cm.) nor more than 0.125 in. (0.32 cm.) in diameter, mounted in the centre of the cup, and carrying two two-bladed brass propellers. The blades of both propellers shall be approximately 0.3 in. (0.8 cm.) wide and shall be set at an angle of approximately 45°. The smaller (upper) propeller shall have an over-all diameter of approximately 0.75 in. (1.9 cm.). The larger (lower) propeller shall have an over-all diameter between 1.25 and 1.75 in. (3.175 and 4.445 cm.). The thickness of the propeller blades shall be not less than 0.05 in. (0.146 cm.) nor more than 0.08 in. (0.2 cm.), which limits correspond respectively to No. 17 and No. 14 I.W.G. The collars on which the propeller blades are mounted shall have horizontal and vertical dimensions not greater than 0.4 in. (1 cm.).

The plane of the centre of the upper propeller shall be 0.4 in. (1 cm.) below the level of the rim of the cup. The plane of the centre of the lower propeller shall be 2.0 in. (5.1 cm.) below the level of the rim of the cup. The level of the rim of the cup is in effect the level of the plane part of the portion of the lower surface of the lid inside the rim.

*Cover proper.*—The cover proper shall be of brass and shall have a rim projecting downward almost to the flange of the cup and fitting the outside of the cup closely. The thickness of the cover, measured just inside the rim, shall be not less than 0.03 (0.08 cm.) nor more than 0.08 in. (0.2 cm.). There shall be a proper locating device engaging with a corresponding locating device on the flange of the cup.

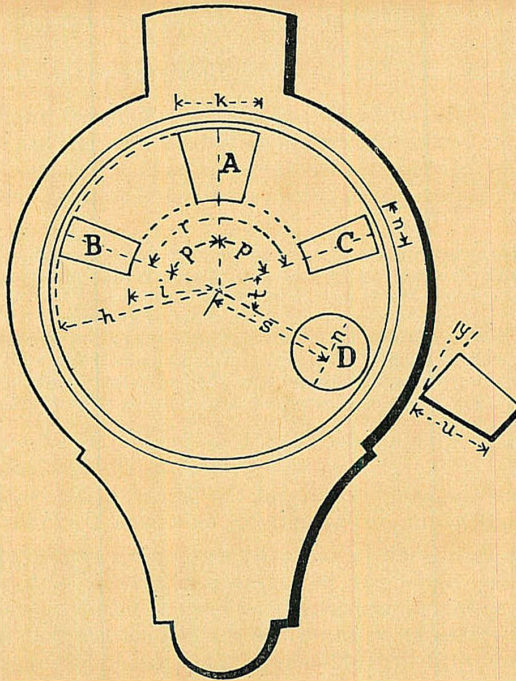
There shall be four openings in the cover.

Opening A is an area defined by arcs of two concentric circles and the intersected lengths of two radii. The radius of the outer circle shall be not less than 0.94 in. (2.38 cm.) nor more than 0.97 in. (2.46 cm.). The chord of the arc of the outer circle shall be not less than 0.5 in. (1.27 cm.) nor more than 0.54 in. (1.37 cm.).

Openings B and C are equal areas, each of the same general form as opening A but of approximately half the (angular) width. The radii of the defining inner and outer circles shall be within the limits specified for the radii of the two circles, arcs of which partially define opening A. The chord of the outer arc for opening B or opening C shall be not less than 0.19 in. (0.475 cm.) nor more than 0.22 in. (0.555 cm.). The sum of the areas of openings B and C shall be not less than 75 per cent. nor more than 100 per cent. of the area of opening A. Openings B and C shall be equally distant from opening A and radii drawn through each of their centres shall be at an angle of not less than 135° nor more than 140°.

Openings A, B and C need not conform exactly to the shape of geometrical figures bounded by arcs of two concentric circles and intersected lengths of radii. Their boundaries must, however, fall on or between the lines indicated by the limiting values of the dimensional specification of the preceding test and of the sketch.

Opening D is for a thermometer collar. Its centre is approximately 0.75 in. (1.9 cm.) from the centre of the lid and on a radius at an angle of not less than 50° nor more than 60° from a radius passing through the centre of opening C. The thermometer collar shall have an inside diameter of approximately 0.5 in. (1.27 cm.). It shall be set at an angle of not less than 10° nor more than 15° from the perpendicular.



<i>h</i>	Minimum	0.94 in.,	maximum	0.97 in.
<i>i</i>	"	0.53 in.,	"	0.56 in.
<i>k</i>	"	0.50 in.,	"	0.54 in.
<i>n</i>	"	0.19 in.,	"	0.22 in.
<i>s</i>	Approximately 0.75 in.			
<i>u</i>	"	0.5 in.		
Angles <i>p</i>	Equal.			
Angle <i>r</i>	Minimum	135°,	Maximum	140°.
" <i>t</i>	"	50°,	"	60°.
" <i>y</i>	"	10°,	"	15°.

*Shutter.*—The lid shall be equipped with a brass shutter, approximately 0.1 in. (0.25 cm.) thick operating on the plane of the upper surface of the lid. The shutter shall be so shaped and mounted that it rotates on the axis of the horizontal centre of the lid between two stops so placed that when in one extreme position the openings A, B and C of the lid are completely closed and when in the other extreme position these orifices are completely opened.

*Flame-exposure Device.*—The flame-exposure device shall have a tip with an opening 0.027 in. (0.7 mm.) to 0.03 in. (0.08 mm.) in diameter. The flame-exposure device shall be equipped with an operating mechanism which, when the shutter is in the "open" position, depresses the tip so that the centre of the orifice is between the planes of the under and upper surfaces of the lid proper at a point on a radius passing through the centre of the larger opening A and approximately 0.1 in. (0.254 cm.) from the outer edge of the opening.

NOTE.—A pilot flame for automatic relighting of the exposure flame should be provided.

A bead 0.16 in. (0.4 cm.) in diameter, of some suitable material, may be mounted on the lid so that the size of the test flame can be regulated by comparison.

The mechanism operating the shutter should be of the spring type and constructed so that when at rest the shutter shall exactly close the three openings. When operated to the other extreme the three openings in the lid shall be exactly open and the tip of the exposure tube shall be fully depressed.

*Stove.*—Heat shall be supplied to the cup by means of a properly designed stove which is equivalent to an air bath. This stove shall consist of (1) an air bath and (2) a top plate on which the flange of the cup rests.

*Air-bath.*—The air-bath shall have a cylindrical interior 1.625 in. (4.13 cm.) to 1.66 in. (4.2 cm.) deep and a diameter not less than 0.125 in. (0.32 cm.) nor more than 0.156 in. (0.4 cm.) greater than the outside diameter of the cup. The air bath may be either a flame heated metal casting or an electric resistance element.

**NOTE.**—If the heating element is a flame-heated metal casting it shall be so designed and used that the temperature of bottom and walls is approximately the same. On this account it should be not less than 0.25 in. (0.635 cm.) thick. The casting shall be designed so that products of combustion of the flame cannot pass up and in contact with the cup.

If the air bath is of the electric resistance type it shall be constructed so that all parts of the interior surface are heated equally. This necessitates an even distribution of resistance wire over bottom and walls and a method of construction such that heat is given out from the whole core of the resistance element rather than directly from the wire.

*Top plate.*—The top plate shall be of metal. The total distance from the upper surface of the plate to the bottom of the air bath shall exceed the distance from the under surface of the flange to the bottom of the cup by not less than 0.063 in. (0.160 cm.) nor more than 0.125 in. (0.32 cm.).

The top plate shall be mounted with an air gap between it and the air bath. The top plate may be attached to the air bath by means of three screws and spacing bushings. The spacing bushings should be of proper thickness to define the air gap which shall be not less than 0.125 in. (0.32 cm.) nor more than 0.187 in. (0.475 cm.). The spacing bushings shall be not more than 0.375 in. (0.95 cm.) in diameter.

*Thermometers.*—Two standard thermometers shall be used with the I.P.T. Standard Pensky-Martens tester. The low range "P.M." thermometer shall be used for tests when the indicated reading falls within the limits 20 to 200°F. The "P.M. high" thermometer shall be used for tests when the indicated reading falls within the limits 230 to 700°F. For the range 200 to 230°F. either thermometer may be employed, depending on the convenience of the operator. The thermometers shall comply with the specifications given in Table I.

Thermometers shall be mounted securely in the thermometer collar so that from the top of this collar to the bottom of the bulb the distance is 2.2 in. ( $\pm 0.05$  in.) and so that the bottom of the bulb is 1.5 in. ( $\pm 0.1$  in.) below the level of the rim of the cup (which corresponds to the level of the lower surface of the portion of the lid inside the rim).

TABLE I.  
*Thermometer Specification.*

	Low range "P.M."	High range "P.M."
Type	Mercury in glass. Solid stem. Nitrogen filled.	Mercury in Glass. Solid stem. Nitrogen filled.
Stem	Lead glass or other suitable glass. Enamel back. Diameter, 6 to 7 mm.	Lead glass or other suitable glass. Enamel back. Diameter 6 to 7 mm.
Bulb	Round. Powell's normal glass, Jena 16 III, or other approved glass. Diameter not to exceed 8 mm.	Round. Powell's normal glass, Jena 16 III, or other approved glass. Diameter not to exceed 8 mm.

	Low range "P.M."	High range "P.M."
Range ...	20°F. to 230°F. ... ..	200°F. to 700°F.
Immersion ...	2.2 in. To be marked by a line etched round the stem, or alternatively, an enlargement made in the stem to ensure 2.2 in. ( $\pm 0.05$ " immersion from the top of the brass plug into which the thermometer is fixed and the bottom of the bulb.	2.2 in. To be marked by a line etched round the stem, or alternatively, an enlargement made in the stem to ensure 2.2 in. ( $\pm 0.05$ " immersion from the top of the brass plug into which the thermometer is fixed and the bottom of the bulb.
Dimensions...	Overall length, approximately 275 mm. Distance from bottom of bulb to 20° line, 70 to 85 mm. Distance from bottom of bulb to 230° line, 235 to 250 mm.	Overall length, approximately 275 mm. Distance from bottom of bulb to 200° line, 70 to 85 mm. Distance from bottom of bulb to 700° line, 235 to 250 mm.
Expansion chamber ...	Required ... ..	Required.
Finish ...	Glass ring ... ..	Glass ring.
Graduation...	All lines, figures and letters clear cut and distinct. Scale graduated to 1°F. divisions. Every 5° and 10° shall be indicated by longer lines.	All lines, figures and letters clear cut and distinct. Scale graduated in 5°F. divisions. Every 10° to be marked with longer lines than the 5°, and every 50° with longer lines than the 10°.
Figuring ...	The scale shall be figured at each 10°F.	The scale shall be figured at each 50°.
Marking ...	"I.P.T.-P.M.-Low." Identification number. Maker's (or vendor's) name or trade mark.	"I.P.T.-P.M.-High." Identification number. Maker's (or vendor's) name or trade mark.

NOTE.—A model of this apparatus is deposited at the Government Laboratory.

*Procedure.*

(a) All parts of the cup and its accessories shall be thoroughly clean and dry before starting the test. Particular care shall be taken to avoid the presence of any gasoline or naphtha used to clean the apparatus after a previous test.

(b) The cup shall be filled with the oil to be tested up to the level indicated by the filling mark.

(c) The lid shall be placed on the cup and the latter set in the stove. Care should be taken to have the locating devices properly engaged. The thermometer shall be inserted. If it is known that the oil will flash above 220°F. the "P.M. high" thermometer may be selected; otherwise, it is preferable to start with the "Low Range P.M." thermometer and change in case a temperature of 220 to 230°F. is reached.

(d) The test flame shall be lighted and adjusted so that it is of the size of a bead  $\frac{5}{32}$  in. (4 mm.) in diameter.

(e) Heat shall be supplied at such a rate that the temperature read on the thermometer increases not less than 9 nor more than 11 degrees per minute. The stirrer shall be turned at a rate of from 1 to 2 revolutions per second.

(f) Application of the test flame shall be made at each temperature reading which is a multiple of 2°F. up to 220°F. For the temperature range above 220°F., application shall be made at each temperature reading which

is a multiple of 5°F. The first application of the test flame shall be made at a temperature at least 30°F. below the actual flash point. Application of the test flame shall be made by operating the device controlling the shutter and test-flame burner so that the flame is lowered in one-half second, left in its lowered position for one second, and quickly raised to its high position. Stirring shall be discontinued during the application of the test flame.

The flash point is taken as the temperature read on the thermometer at the time of the flame application that causes a distinct flash in the interior of the cup. The true flash must not be confused with the bluish halo that sometimes surrounds the test flame for the applications preceding the one that causes the actual flash.

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