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Petroleum waxes

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Contents

	Page
1 Scope	1
2 Normative references	1
3 Terms and definitions	1
4 Classification	2
5 Quality	3
6 Test methods	4
6.1 Testers general	4
6.2 Sampling methods	4
6.3 Melting point test method	4
6.4 Penetration test method	8
6.5 Reaction test method	14
6.6 Oil content test method	14
6.7 Colour test method	21
6.8 Flash point test method	21
6.9 Kinematic viscosity test method	21
6.10 Consistency test method	21
6.11 Acid value test method	25
7 Packaging	25
8 Designation of products	25
9 Marking	25

Foreword

This Japanese Industrial Standard has been revised by the Minister of Economy, Trade and Industry through deliberations at the Japanese Industrial Standards Committee as the result of proposal for revision of Japanese Industrial Standard submitted by Wax Industry Association of Japan (WIAJ)/Japanese Standards Association (JSA) with a draft being attached, based on the provision of Article 12, paragraph (1) of the Industrial Standardization Act applied mutatis mutandis pursuant to the provision of Article 16 of the said Act.

This edition replaces the previous edition (**JIS K 2235** : 2009), which has been technically revised.

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Petroleum waxes

1 Scope

This Japanese Industrial Standard specifies the requirements for petroleum waxes for industrial use (hereafter referred to as waxes).

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this Standard. The most recent editions of the standards (including amendments) indicated below shall be applied.

- JIS B 0651 *Geometrical Product Specifications (GPS) — Surface texture : Profile method — Nominal characteristics of contact (stylus) instruments*
- JIS B 7410 *Liquid-in-glass thermometers for testing of petroleum product*
- JIS K 2207 *Petroleum asphalts*
- JIS K 2220 *Lubricating grease*
- JIS K 2251 *Crude petroleum and petroleum products — Sampling*
- JIS K 2252 *Petroleum products — Testing method for reaction*
- JIS K 2265-4 *Determination of flash points — Part 4 : Cleveland open cup method*
- JIS K 2283 *Crude petroleum and petroleum products — Determination of kinematic viscosity and calculation of viscosity index from kinematic viscosity*
- JIS K 2501 *Petroleum products and lubricants — Determination of neutralization number*
- JIS K 2580 *Petroleum products — Determination of colour*
- JIS K 8295 *Glycerol (Reagent)*
- JIS K 8900 *2-Butanone (Reagent)*
- JIS M 8100 *Particulate materials — General rules for methods of sampling*
- JIS Z 8401 *Rounding of numbers*

3 Terms and definitions

For the purpose of this Standard, the following terms and definitions apply.

3.1

paraffin wax

solid wax at ordinary temperature, refined by separation from vacuum distillate oil

3.2

micro wax

solid wax at ordinary temperature, refined by separation from vacuum residue oil or heavy distillate oil

NOTE Generally, it is called a micro crystalline wax.

3.3

petrolatum

semisolid wax at ordinary temperature, refined by separation from vacuum residue oil

3.4

melting point

temperature at which the temperature drop rate of a molten sample reaches a specific rate or under when the sample is left to cool under specified condition for paraffin wax, and the temperature at which the first drop falls from a thermometer after heating a fixed amount of solidified sample adhered to the thermometer under specified conditions for micro wax and petrolatum

3.5

penetration

indication of the hardness of paraffin wax and micro wax, expressed in 0.1 mm increments that represent the vertical penetration depth of a specified needle into a sample under specified conditions

3.6

oil content

dissolved amount in methyl ethyl ketone of a sample at -32°C , expressed by mass %

3.7

consistency

indication of the hardness of petrolatum, expressed in 0.1 mm increments that represent the vertical penetration depth of a specified cone into a sample under specified conditions

4 Classification

The waxes are classified into paraffin waxes, micro waxes and petrolatums. Further, paraffin waxes are classified into eight classes according to the melting point as shown in Table 1, micro waxes into five classes according to the melting point as shown in Table 2 and petrolatums into four classes according to the colour as shown in Table 3.

Table 1 Paraffin wax

Class ^{a)}	Melting point °C	Penetration		Reaction	Oil content Mass %	Saybolt colour
		(25 °C)	(35 °C)			
120P	48.9 or over to and excl. 51.7	30 max.	—	Neutral	0.8 max.	+26 min.
125P	51.7 or over to and excl. 54.4	25 max.			0.5 max.	+28 min.
130P	54.4 or over to and excl. 57.2	—	50 max.			
135P	57.2 or over to and excl. 60.0		40 max.			
140P	60.0 or over to and excl. 62.7		30 max.			
145P	62.7 or over to and excl. 65.5		25 max.			
150P	65.5 or over to and excl. 68.3					
155P	68.3 or over to and excl. 71.0					
Note ^{a)} The designation of class herein consists of a numeral of the lowest temperature in the range of melting point converted into °F from °C, and P for paraffin.						

Table 2 Micro wax

Class ^{a)}	Melting point °C	Penetration (25 °C)	Reaction	Oil content Mass %	ASTM colour
150M	60.0 or over to and excl. 68.3	50 max.	Neutral	5 max.	2.5 max.
160M	68.3 or over to and excl. 76.6	40 max.			
170M	76.6 or over to and excl. 82.1	30 max.		3 max.	2 max.
180M	82.1 or over to and excl. 87.8				
190M	87.8 or over			2 max.	1 max.
Note ^{a)} The designation of class herein consists of a numeral of temperature in the range of melting point converted into °F from °C, and M for micro.					

Table 3 Petrolatum

Class	Reaction	Flash point °C	Kinematic viscosity (100 °C) mm ² /s	Melting point °C	Con- sistency	Total acid value mgKOH/g	ASTM colour
No. 1	Neutral	190 min.	15 to 30	45 to 80	80 to 140	0.1 max.	6.5 Dil max.
No. 2			10 to 20		140 to 210		8.0 max.
No. 3							4.5 max.
No. 4							3.0 max.
NOTE 1 1 mm ² /s=1 cSt							
NOTE 2 The common names of petrolatum numbers 1 to 4 are as follows.							
— No. 1 Dark green							
— No. 2 Green							
— No. 3 Amber							
— No. 4 Light amber							

5 Quality

The waxes are solid or semisolid mixtures of various hydrocarbons at ordinary temperature, which are refined by separation from petroleum. When tested in accordance with Clause 6, the requirements specified in Table 1 to Table 3 shall be conformed to.

Further, the waxes for packaging food shall not contain matters which are likely to contaminate food under the ordinary service state.

6 Test methods

6.1 Testers general

Under an ordinary service state, the testers shall be free from any risk of causing a hazard, sufficiently durable, correct in shape and assembled well, and shall not be likely to cause any mechanical and electrical failures.

6.2 Sampling methods

6.2.1 Molten state In accordance with **JIS K 2251**.

6.2.2 Packaged lumpy or plate products The sample pieces shall be obtained by taking a package container according to the method specified in **4.2.4** of **JIS K 2251**, and scraping pieces from the container in accordance with **8.5** of **JIS K 2251**.

6.2.3 Powdery or granular products In accordance with **JIS M 8100**.

6.2.4 Packaged petrolatum In accordance with **8.3** of **JIS K 2251**.

NOTE The amount of sample necessary for the measurement of each property specified in this Standard shall be as follows.

Paraffin wax 250 g to 300 g

Micro wax 200 g to 250 g

Petrolatum (consistency 200 max.) About 1 000 g

Petrolatum (consistency 200 min.) About 2 000 g

6.3 Melting point test method

6.3.1 Paraffin wax

6.3.1.1 Outline of test method

Take a molten sample into a sample vessel, keep in an air bath, and allow to cool in a water bath kept at a specified temperature. Read the temperature of the sample at every 15 s. When the continuous five reads identically fall within 0.1 °C in temperature difference, average them and take the result as the melting point of the sample.

6.3.1.2 Paraffin wax melting point tester

The tester shall be composed of the following.

- a) **Sample vessel**, made of Class 1 hard glass. An example is shown in Figure 2.
- b) **Air bath**, metallic flat-bottom cylinder equipped with a cork stopper, capable of sealing the bath hermetically and holding the sample vessel vertically at its centre (see Figure 1).
- c) **Water bath**, metallic flat-bottom cylinder, capable of keeping an air bath at the centre of the water bath by the metallic cover and the hook attached to the cover. The cover shall be equipped with an insertion hole of water bath thermometer (see

Figure 1).

- d) **Melting point measuring thermometer**, of No. 35 (MP) in thermometer number specified in **JIS B 7410**, or that having an equivalent performance.
- e) **Water bath thermometer**, of 1 °C in scale interval.

Unit: mm

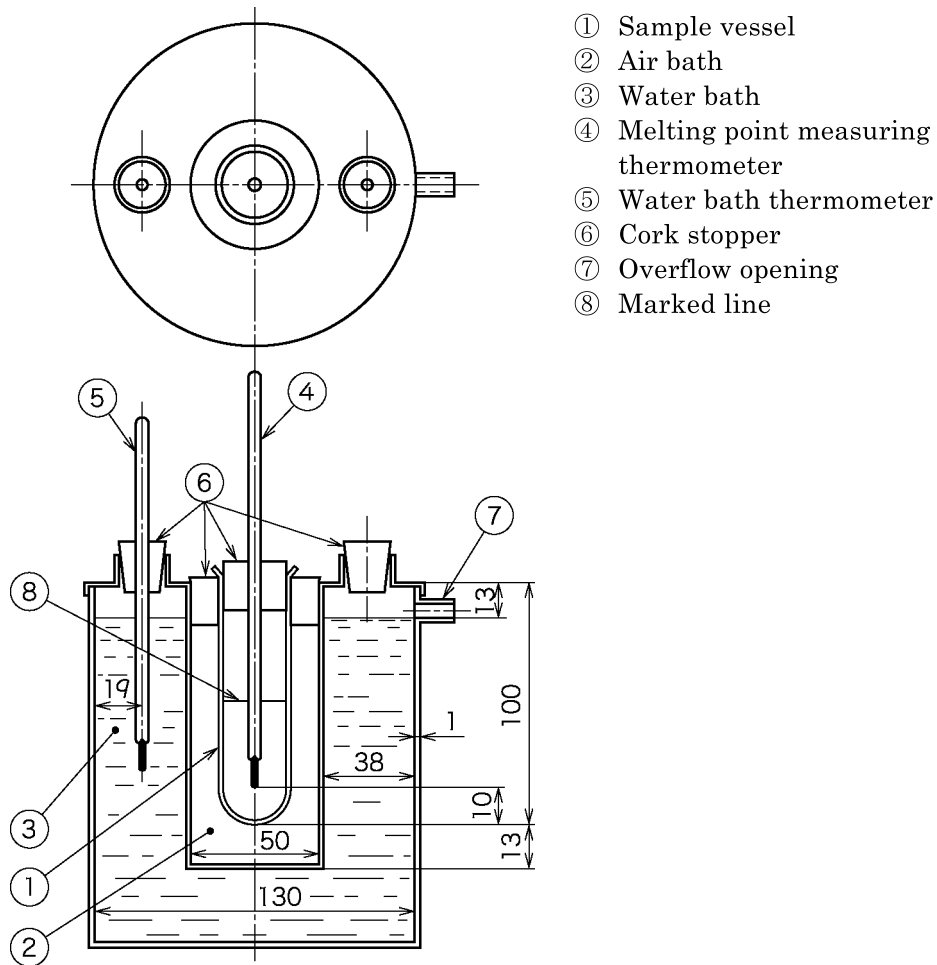


Figure 1 Paraffin wax melting point tester (example)

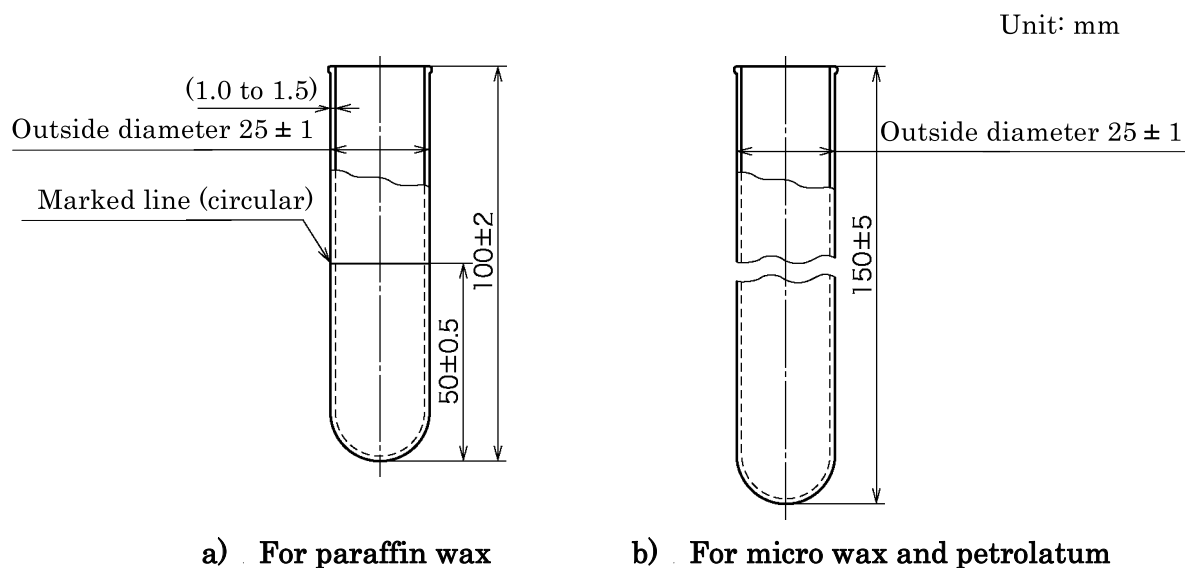


Figure 2 Sample vessel (example)

6.3.1.3 Test procedure

The test procedure shall be as follows.

- a) Mount an air bath at a specified position in a water bath and fill the water bath with water at 16 °C to 28 °C up to brim over from an overflow opening. The temperature of water bath shall be kept within a range of 16 °C to 28 °C during the test.
- b) Take the sample into a suitable vessel and melt it by heating at the temperature of 8 °C higher at least than an estimated melting point (however, do not exceed 93 °C). When a hotplate is used to heat the sample, any local overheating should be avoided.

NOTE Local heating and/or molten state kept for a long time may cause the melting point decrease or the colouration of the sample due to the oxidation caused by heat-induced deterioration.

- c) Take the molten sample up to the marked line of sample vessel. Insert a melting point measuring thermometer into the centre of cork stopper, and align its immersion line to the bottom surface of cork stopper. Put the cork stopper into the sample vessel, stopper it hermetically with the bottom end of thermometer 10 mm above the bottom of the sample vessel, and attach the sample vessel to the air bath as shown in Figure 1. In this case, the temperature of the molten sample shall be at least 8 °C higher than the estimated melting point.

If cloudiness appears on the sample when it is taken to the marked line of the sample vessel, it is advisable to remove the cloudiness by heating it carefully in a boiling water bath.

- d) Read and record the reading on the melting point measuring thermometer to 0.05 °C at each 15 s. Continue the test until the continuous five reads identically fall within 0.1 °C in a temperature difference.