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(PAJ)

**Determination of flash point —
Part 1: Tag closed cup method**

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Foreword

This translation has been made based on the original Japanese Industrial Standard established by the Minister of Economy, Trade and Industry, through deliberations at the Japanese Industrial Standards Committee according to the proposal of establishing a Japanese Industrial Standard from Petroleum Association of Japan (PAJ), with a draft being attached, based on the provision of Article 12 Clause 1 of the Industrial Standardization Law.

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JIS K 2265 consists of the following 4 parts, under the general title “*Determination of flash point*”:

Part 1 : Tag closed cup method

Part 2 : Rapid equilibrium closed cup method

Part 3 : Pensky-Martens closed cup method

Part 4 : Cleveland open cup method

Determination of flash point—

Part 1 : Tag closed cup method

Introduction

JIS K 2265 used as the basis of this Japanese Industrial Standard was established in 1953, and then revised seven times so far. Although the last revision was made in 1996, the technical content has been changed in order to conform to the domestic actual situation. **JIS K 2265** was divided into four parts specifying each of the four test methods.

In addition, the corresponding International Standard has not been established at present.

Though dangerous reagents, operations and testers are sometimes used in this Standard, safe treating methods are not always specified completely. Therefore, users of those tests shall decide appropriate items to be prohibited on safety and sanitation prior to testing.

1 Scope

This part of **JIS K 2265** specifies determination of flash point of petroleum products and related products whose flash point is not more than 93 °C by using a flash point tester based on the tag closed cup method.

NOTE : This Standards group specifies the test methods shown in Annex A.

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 7410 | <i>Liquid-in-glass thermometers for testing of petroleum product</i> |
| JIS K 2251 | <i>Crude petroleum and petroleum products—Sampling</i> |
| JIS Q 0033 | <i>Uses of certified reference materials</i> |
| JIS Q 0034 | <i>General requirements for the competence of reference material producer</i> |
| JIS Q 0035 | <i>Certification of reference materials—General and statistical principles</i> |
| JIS Z 8401 | <i>Guide to the rounding of numbers</i> |
| JIS Z 8402-4 | <i>Accuracy (trueness and precision) of measurement methods and results—Part 4: Basic methods for the determination of the trueness of a standard measurement method</i> |
| JIS Z 8402-6 | <i>Accuracy (trueness and precision) of measurement methods and results—Part 6: Use in practice of accuracy values</i> |

ISO 3171 *Petroleum liquids—Automatic pipeline sampling***3 Term and definition**

For the purposes of this Standard, the following term and definition apply.

3.1 flash point

lowest temperature of the test portion, corrected to a barometric pressure of 101.3 kPa, at which application of a test flame causes the vapour of the test portion to ignite and the flame to propagate across the surface of the liquid, under the specified conditions of test

4 Principle of test

Put 50 ml $\pm$ 0.5 ml of test portion in a closed test cup and heat it gradually at a raising rate specified in table 1. At each interval of temperature elevation shown in table 1, bring the ignition source close to the test cup, and obtain the lowest temperature required for ignite of the vapour of test portion.

Table 1 Temperature condition of flash point test with tag closed cup method

Unit : °C

Expected flash point of a test portion	Temperature raising rate (°C /s)	Temperature interval for applying an ignition source
Less than 60	1/(60 $\pm$ 6)	every 0.5
60 or higher	3/(60 $\pm$ 6)	every 1.0

5 Reagents**5.1 Solvent for washing**

The solvent shall be suitable to remove traces of the previous test portion tested before from the test cup and the cover.

NOTE : The solvent shall be chosen depending on what type of sample was tested before, and how much residue sticks on the cup. In order to remove the traces of test portion, the aromatic solvent (benzene-free) of a low boiling point should be used. Moreover, in order to remove the gummy adhesives, a mixed solvent like toluene-acetone-methanol (TAM) may be effective.

5.2 Liquid for verification

As specified in Annex B, the liquid shall be a series of certified reference material (hereafter referred to as “CRM”) or the secondary working standard (hereafter referred to as “SWS”).

6 Apparatus**6.1 Flash point apparatus**

The flash point tester based on the tag closed cup method as specified in Annex C is applicable.

When using an automatic apparatus, the result obtained shall be within the tolerance shown in the accuracy of this Standard. The size and mechanism of the test cup and the cover shall conform to the specifications of Annex C. The test procedure shall conform to clause 10. An automatic apparatus shall be adjusted and handled entirely according to the manufacturer's instructions for use.

If the electric ignition source is used, under a certain situation, the result may be different from that obtained with a gas test flame. Moreover, the electric ignition source may produce a result with large variations.

When a doubt arises in a result, the result obtained with a manual tester using the gas test flame shall be taken as a judging standard.

6.2 Thermometer

6.2.1 Thermometer for sample

The thermometer for sample shall be a thermometer No. 30 (PMF) or 50 (TAG) as specified in JIS B 7410.

Based on the expected flash point, the thermometer shall be chosen first.

In addition, when using the thermometry equipment of the electric type, indication accuracy and response shall be the same.

6.2.2 Thermometer for liquid bath

This shall be the same as the thermometer for sample.

6.3 Barometer

The readable scale shall be the digit of 0.1 kPa at minimum.

Such a barometer that is used at a meteorological station, an airport, etc. and that is beforehand corrected to the reading at the sea level shall not be used.

In addition, although there are some barometers whose reading is corrected to 0 °C automatically, this correction is not necessary.

7 Preparation of apparatus

7.1 Location of apparatus

Place the apparatus on a level and steady surface in a draught-free room.

When the draught is not avoided, enclose the back and both sides of the tester with the air screen of a suitable size.

When testing the sample which generates poisonous vapour, place the apparatus in the draft chamber which can adjust the flow of the air individually, and make adjustment so that the air may absorb vapour, during the test, without flowing around of the test cup.

7.2 Washing of test cup and accessory

Use the suitable solvent and remove the gummy traces, residues, etc. of previous tests from the test cup, the cover, and its accessories. In order to thoroughly remove the solvent used, spray the pure air and dry them. A tester shall be cleaned and maintained according to the manufacturer's instructions for use.

7.3 Assembly of apparatus

Make it sure that there are no damages and adhesives in the test cup, cover, and other parts. Assemble the apparatus according to the provisions of Annex C.

7.4 Bath liquid

The solution for bath liquid to serve shall be one specified in table 2 according to the expected flash point of the sample. The temperature of bath liquid shall be at least 11 °C lower than the expected flash point of the sample. When it is necessary to cool the solution, instead of putting ice or dry ice, etc. into the solution, cool the solution in another vessel and then pour it into the liquid bath.

Table 2 Bath liquid

Expected flash point of a sample °C	Bath liquid
Under 13	Equivolume mixture of water and ethylene glycol
13 or over to and excl. 60	Water or equivolume mixture of water and ethylene glycol
60 or over to and incl. 93	Equivolume mixture of water and ethylene glycol

7.5 Verification of apparatus

Verification of apparatus shall be as follows.

- a) Perform a test using CRM at least once a year and verify that a tester functions normally. The absolute value of the difference between the obtained result and the certified value of CRM shall be $R/\sqrt{2}$ or less, with R being the permissible reproducibility tolerance at the time of certification of this CRM.

An apparatus should be verified periodically using SWS.

CRM or SWS shall be used to verify an apparatus and to prepare SWS. The procedures are in accordance with Annex B.

- b) The value acquired by verification shall not be used to express a bias. It shall not be used to correct the flash point that is subsequently measured using this tester.

8 Sampling and preparation of samples

The sample for test shall be sampled and prepared in accordance with the sampling method of a primary sample and the preparation method of a secondary sample which are specified in JIS K 2251 or the similar method. In the case of automatic sampling, The sampling and preparation may be in accordance with ISO 3171.