GB

NATIONAL STANDARD OF THE

PEOPLE'S REPUBLIC OF CHINA

ICS 75.080

E 30

GB/T 3536-2008

Replacing GB/T 3536-1983

Petroleum products - Determination of flash and fire points - Cleveland open cup method

(ISO 2592:2000, Determination of flash and fire points - Cleveland open cup method, MOD)

石油产品　闪点和燃点的测定 克利夫兰开口杯法

Issued on: August 25, 2008 **Implemented on: February 01, 2009**

Issued by: General Administration of Quality Supervision, Inspection and Quarantine;
Standardization Administration of the People's Republic of China.

Table of Contents

Foreword

This Standard revises and adopts the international standard ISO 2592: 2000 *Determination of flash and fire points - Cleveland open cup method* (English version).

This Standard is re-drafted according to ISO 2592:2000.

For convenience, a comparison list of the clauses of this Standard and those of ISO 2592:2000 is given in Appendix C.

In order to suit our country's national conditions, this Standard has been modified when adopting ISO 2592:2000. The main differences between this Standard and ISO 2592:2000 are as follows:

-- Revise the name of this Standard from *Determination of flash and fire points - Cleveland open cup method* to *Petroleum products - Determination of flash and fire points - Cleveland open cup method*, and modify the English name accordingly;

-- Modify the referenced standards in ISO 2592:2000 to the corresponding current national standards and industry standards in our country;

-- In the result expression of this Standard, change "rounded to the nearest even number" to "rounded to an integer";

-- Remove Appendix B "Thermometer specification" in ISO 2592:2000, and directly quote the GB-5 thermometer in GB/T 514, which is consistent with the thermometer specification requirements of ISO 2592:2000.

For the convenience of use, this Standard has made the following editorial changes:

-- Modify the text expressions of repetition and reproducibility according to the customs of our country.

This Standard replaces GB/T 3536-1983 *Petroleum products - Determination of flash and fire points - Cleveland open cup method*. GB/T 3536-1983 is equivalent to ISO 2592:1973.

Compared with GB/T 3536-1983, the main changes of this Standard are as follows:

-- Add the use of automated equipment to this Standard;

-- Add the verification content of apparatus in the clause Preparation of apparatus, and give specific instructions in Appendix B "Verification of apparatus";

-- Add the clause Sampling and the clause Sample preparation;

-- In this Standard, add the content “If a foam persists in the final stages of the test, discard the result”;

-- In this Standard, add the content “When the temperature at which the flash point is observed is less than 18 °C from the temperature of the first application of the test flame, the result is not valid”;

-- In GB/T 3536-1983, the barometric pressure is corrected in sections when the barometric pressure is lower than 95.3 kPa, and is corrected separately by 2 °C, 4 °C and 6 °C; in this Standard, the barometric pressure is uniformly calculated and corrected by an equation;

-- Revise the reproducibility of flash point in this Standard from 16 °C to 17 °C;

-- Remove Appendix B “Thermometer specification” in GB/T 3536-1983, and change the thermometer to GB-5 thermometer in accordance with GB/T 514;

-- Add Appendix B “Verification of apparatus” in this Standard.

Appendix A of this Standard is normative; Appendix B and Appendix C are informative.

This Standard was proposed by the National Technical Committee on Petroleum Products and Lubricants of Standardization Administration of China.

This Standard shall be under the jurisdiction of Subcommittee on Petroleum Fuels and Lubricants of National Technical Committee on Petroleum Products and Lubricants of Standardization Administration of China.

The drafting organizations of this Standard: SINOPEC Research Institute of Petroleum Processing.

The drafters of this Standard: Chen Jie, Guo Tao.

The previous standard version replaced by this Standard is:

-- GB/T 3536-1983.

Petroleum products - Determination of flash and fire points - Cleveland open cup method

Warning: The use of this Standard may involve hazardous materials, operations and equipment. This Standard does not purport to address all of the safety problems associated with its use. It is the responsibility of the user of this Standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.

1 Scope

This Standard specifies a procedure for the determination of flash and fire points of petroleum products using the Cleveland open cup apparatus. It is applicable to petroleum products having an open cup flash point above 79 °C, except fuel oils, which are most commonly tested by the procedure described in GB/T 261.

Note: Flash point and fire point are indications of the ability of a substance to form a flammable mixture with air under controlled conditions, and then to support combustion. Flash point and fire point are only two of a number of properties that may contribute towards the assessment of overall flammability and combustibility of a material.

2 Normative references

The following normative documents contain provisions which, through reference in this test, constitute provisions of this Standard. For dated references, all subsequent amendments (not including errata content) or revisions do not apply to this Standard. However, parties to agreements that are based on this Standard are encouraged to study whether the latest versions of these documents can be used. For undated references, the latest edition applies to this Standard.

GB/T 261, Determination of flash point - Pensky-Martens closed cup method (GB/T 261-2008, ISO 2719:2002, MOD)

GB/T 514, Specification for liquid-in-glass thermometers for testing of petroleum products

GB/T 4756, Method for manual sampling of petroleum liquids (GB/T 4756-1998, eqv ISO 3170:1988)

outside of the apparatus, empty, clean and refill it. Destroy or remove any air bubbles or foam on the surface of the sample whilst maintaining the correct level of test portion in the test cup. If a foam persists in the final stages of the test, discard the result.

10.4 Light the test flame and adjust it to a diameter to 3.2 mm ~ 4.8 mm, the size of the comparison bead if one is mounted on the apparatus.

10.5 Apply heat initially so that the rate of temperature rise of the test portion is 14 °C/min ~ 17 °C/min. When the test portion temperature is approximately 56 °C below the expected flash point, decrease the heat so that the rate of temperature rise for the last 23 °C ± 5 °C before the expected flash point is 5 °C/min ~ 6 °C/min. During the test, take care to avoid disturbing the vapours in the test cup by careless movements or breathing near the test cup.

10.6 Starting at least 23 °C ± 5 °C below the expected flash point, apply the test flame when the temperature read on the thermometer reaches each successive 2 °C mark. With a smooth continuous motion, taking approximately 1 s, pass the test flame in one direction across the centre of the test cup, at right angles to the diameter which passes through the thermometer, either in a straight line or along the circumference of a circle having a radius of at least 150 mm. The centre of the test flame shall move in a horizontal plane not more than 2 mm above the plane of the upper edge of the test cup. For the next test flame application, pass the flame in the opposite direction. If a skin forms over the test portion, carefully move it aside and continue the determination.

10.7 Record as the observed flash point, the temperature of the test portion, read on the thermometer, when application of the test flame causes the vapour of the test portion to ignite and propagate across the surface of the liquid. Do not confuse the true flash point with the bluish halo that sometimes surrounds the test flame.

10.8 When the temperature at which the flash point is observed is less than 18 °C from the temperature of the first application of the test flame, the result is not valid. Repeat the test using a fresh test portion, adjusting the temperature of the first application of the test flame until a valid determination is obtained when the flash point is 18 °C above the temperature of the first application of the test flame.

11 Procedure for determining fire point

11.1 To determine the fire point, after carrying out the procedure specified in Clause 10, continue heating so that the test portion temperature increases at a rate of 5 °C/min ~ 6 °C/min. Continue the application of the test flame at 2 °C intervals until the vapour of the test portion ignites and continues to burn for at least 5 s. Record the temperature at this point as the observed fire point of the sample.

11.2 If the fire persists for more than 5 s, extinguish it with a cover made of metal or other fire-resistant material fitted with a handle. An example of such a cover is given in Figure A.2.

This is an excerpt of the PDF (Some pages are marked off intentionally)

------ The End ------