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**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

GB/T 13377-2010

Replacing GB/T 13377-1992; GB/T 2540-1981

**Crude petroleum and liquid or solid petroleum products --
Determination of density or relative density -- Capillary stoppered
pycnometer and graduated bicapillary pycnometer methods**

原油和液体或固体石油产品 密度或相对密度的测定 毛细管塞比重瓶和带刻度双
毛细管比重瓶法

(English Translation)

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Foreword

This revised standard adopts the International Standard ISO 3838:2004 "Crude petroleum and liquid or solid petroleum product density or relative density measurement Given capillary stoppered pycnometer and graduated bicapillary Pycnometer "(in English).

This standard is based on ISO 3838:2004 re-drafted.

Suitable for China's national conditions, the use of this standard in the ISO 3838:2004 when modified. This standard and ISO 3838:2004 main Technical differences and the following reasons.

Love --- on normative references, this standard has been adjusted technical differences, in order to adapt to China's technical conditions, adjustment Focus is reflected in the status of Chapter 2, "Normative references", the specific adjustments are as follows.

- with the GB/T 514 instead of ISO 653 (see 5.4), regulation in GB/T 514 in the requirement to use the thermometer with ISO 653 Given no technical differences;

- with the GB/T 8017 instead of ISO 3007 (see 1.2);
- non-equivalent to international standards of GB/T 17291 replaces ISO 5024 (see 10.2.1).
- Removed 15 °C 60 °F and related content (see chapter 1, Chapter 2, Section 6, Chapter 7 and Chapter 5, Section 10), due to our Standard temperature of 20 deg.] C;
- Increasing the proportion of bottles of water on the plug capillary measuring frequency 7.2.6 related content, in order to avoid controversy, raise the standard of strict I have the honor of.

This standard replaces GB/T 2540-1981 "Petroleum products - Determination of density (pycnometer method)" and GB/T 13377-1992 "oil and Liquid or solid petroleum products - Determination of density or relative density - Capillary stoppered pycnometer and graduated bicapillary pycnometer method. " this standard compared with GB/T 13377-1992 main changes are as follows.

- 5.1.1 adds "Pycnometer shall meet the requirements of ISO 3507.";
- 5.1.4 adds content, clear in FIG. 1 b) and c) does not apply to type pycnometer measuring temperature far below the temperature of the Laboratory Happening;
- In 5.2, adds support for dual-band scale capillary pycnometer to comply with the ISO 3507 requirements in Putin pycnometer;
- 5.4, the clear water bath thermometer to comply with GB/T 514 in GB -65, GB -66, GB -67 specifications in Appendix B "rod thermometer Size" removed;
- The original table in Appendix A to the body A.2 Table 1;
- Delete the original 5.7 and 5.8 of the laboratory vacuum pumps and vacuum dryers content;
- In Chapter 6 adds "Whenever the pycnometer to be calibrated and then dried under vacuum to." Note as well as content and warnings;
- Note (1)(2)(4) original content standards changed after 7.2 standard text, remove Note (3) content;
- 7.2.1 in the original standard "was cooled to about 18 °C distilled water" to "cool to slightly below 20 °C in distilled water";
- Remove 7.3 in relation to the pretreatment of the sample;
- Revised 7.5 pycnometer recalibrate time;
- Increased in 9.2 "If the temperature is below the temperature of the laboratory test, immersion 20min usually suffice" content;
- Increasing the thermal expansion of about 10.3 pycnometer amendments related

content;

--- The density of water table to table 1990, the density of water under the International Temperature Scale of 1990.

This standard compared with GB/T 2540-1981 The main changes are as follows.

--- Increase the content of crude method of density determination (see Chapter 1, Section 3, Chapter 5, Chapter 6, Chapter 7, Chapter 8, Chapter 9, Chapter 10 and Chapter 11);

--- Increased crude oil and liquid or solid petroleum products - Determination of relative density of relevant content (see Chapter 1, Section 3, Chapter 7, , Chapter 10, Chapter 11 and Chapter 12);

--- 5.3 in the water bath temperature control requirements from the original desired temperature to within 0.1 °C desired temperature of 0.05 °C or less;

--- Chapter in precision, increasing the reproducibility of the data.

This standard by the National Standardization Technical Committee on Petroleum Products and Lubricants made.

This standard by the National Petroleum products Petroleum measurement of static and light hydrocarbons and lubricants Technical Committee of Standardization Technical Committee centralized.

This standard was drafted. China Petroleum & Chemical Corporation Research Institute of Petroleum.

1 Scope

1.1

standard specifies the method for determination of density and relative density of the liquid state of crude oil and petroleum products.

1.2

This standard capillary stoppered pycnometer method for the determination of solid and coal tar products, including road asphalt, creosote and tar or asphalt with a mixture of petroleum products, it does not apply to the determination according to GB/T 8017 Reid vapor pressure measured more than 50kPa (0.5bar) or initial boiling Dot density and relative density of less than 40 °C highly volatile liquid.

1.3

density graduated bicapillary pycnometer method applies in addition to high viscosity products all products and accurate determination of the relative density, and Especially suitable for small amounts of sample tests. This method is limited to the determination according to GB/T 8017 measured Reid vapor pressure of not more than 130kPa (1.3 bar)

at the test temperature and kinematic viscosity is lower than 50mm²/s liquid.

2 Normative references

The following documents contain provisions which, through reference in this standard and become the standard terms. For dated references, subsequent Amendments (not including errata content) or revisions do not apply to this standard, however, encourage the parties to the agreement are based on research Whether the latest versions of these documents. For undated reference documents, the latest versions apply to this standard.

GB/T 514 Petroleum products test glass liquid thermometer technical conditions GB/T 1885 Petroleum Measurement Tables (GB/T 1885-1998, eqvISO 91-2.1991) GB/T 8017 Petroleum products - Determination of vapor pressure (Reid Method) GB/T 17291 standard reference conditions of petroleum liquid and gas measurement (GB/T 17291-1998, neqISO 5024. 1976) ISO 3507:1999 laboratory glassware pycnometer ISO 5024:1999 Petroleum liquids and liquefied petroleum gas measurement standard reference conditions

3 Terms and Definitions

The following terms and definitions apply to this standard.

Density

At a predetermined temperature, the number of unit volume contained in the mass of material in kg/m³ or g/cm³ (g/mL) indicates.

Note: When the density of the report, indicate the use of the density and temperature units. For example, kilograms per cubic meter or grams per milliliter, t °C.

Air apparent mass apparentmassinair Control standard weight, weighing the value obtained in the air, where the standard weight and body were alleged air buoyancy effects Correction.

Apparent density observeddensity Charles takes GB/T 1885 standard density value corresponding to the desired table. This value is used in the soda lime glass hydrometers calibration temperature different from the real Under test temperature measurement, no expansion and contraction correction glass, the equivalent of a glass hydrometer readings.

The relative density Substance at a given temperature and density than the density of the reference temperature of the standard substance. The standard reference material is water, the reference temperature Usually standard temperature.

Note: In reporting relative density, indicating t₁ and t₂.

Principle 4