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

GB/T 22226-2026

Replacing GB/T 22226-2008

Test method for the boiling point of engine coolants

发动机冷却液沸点测定法

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Foreword

This document complies with the provisions of GB/T 1.1-2020 "Standardization Work Guidelines Part

1. Structure and Drafting Rules of Standardization Documents". Drafting. This document replaces GB/T 22226-2008 "Determination of Boiling Point of Engine Coolant". Compared with GB/T 22226-2008, except for the structure... Aside from adjustments and editorial changes, the main technical changes are as follows:

- a) A new chapter on "Terms and Definitions" has been added (see Chapter 3);
- b) Change "thermometer" to "temperature measuring device" and add "thermocouple" (see 5.5, 4.4 in the 2008 edition);
- c) The "Atmospheric Pressure Difference Correction Factor Table" has been deleted (see section 8.2 of the 2008 edition);
- d) Added "Calculation of Boiling Point" (see 9.3);
- e) The "Result Representation" has been changed to be accurate to 0.5°C for readings observed by thermometers and accurate to 0.5°C for readings observed by thermocouples. The result should be accurate to 0.1°C (see 10.1, 10.2, Chapter 9 of the 2008 edition);
- f) The report content has been expanded (see Chapter 12). Please note that some content in this document may involve patents. The issuing organization of this document assumes no responsibility for identifying patents. This document was proposed and is under the jurisdiction of the National Technical Committee on Standardization of Hazardous Chemicals Management (SAC/TC251). This document was drafted by: Guangzhou Customs Technology Center, Zhanjiang Customs Technology Center, Ruili Customs

Comprehensive Technology Center, and Quanzhou Customs Comprehensive Technology Center. Technical Service Center, Guangdong Academy of Sciences Testing and Analysis Institute (China Guangzhou Analysis and Testing Center), Anmei Technology Co., Ltd., China Petroleum Oil and Chemical Industries Federation. The main drafters of this document are. Mo Man, Tan Zhiyi, Lin Hai, Liu Hanqing, Chen Gaoqun, Zhou Xiuqing, Wen Huan, Liu Rende, Chen Yiwen, and Hao Yuan. The release history of this document and the document it replaces is as follows:

---First published in.2008 as GB/T 22226-2008;

---This is the first revision. Engine coolant boiling point determination method

1.Scope This document describes a method for determining the boiling point of engine coolant, including a method overview, apparatus, sample preparation, apparatus preparation, and steps. Steps, calculations, result presentation, precision, and reporting. This document applies to the determination of the boiling point of engine coolant.

4.Method Overview Pour 60 mL of the sample into a 100 mL flask. Heat to boiling under normal pressure. When vapor-liquid equilibrium is reached, read the temperature of the sample. The temperature, after atmospheric pressure correction, is the boiling point of the sample.

5 Instruments and Apparatus

5.1 Overview The instrument setup is shown in Figure 1.

5.2 Flask A 100mL round-bottomed, short-necked heat-resistant glass flask with a neck featuring a 19/38 standard conical ground glass concave joint and an outer diameter of... A 10mm angled insertion port is used; after inserting the thermometer, the thermometer bulb (or thermocouple probe) should be 6.5mm from the center of the bottom of the flask. See Figure 2 for bottle specifications.

5.3 Condenser The condenser tube should be a water-cooled, reflux glass tube with a.200mm long condenser sleeve. The bottom end of the condenser tube should have a 19/38 mark. Quasi-conical drip-feed frosted convex interface.

5.4 Zeolite For each measurement, add 3 or 4 silicon carbide particles, No. 8 coarse sand, or other suitable inert fragments. For samples with a large number of air bubbles... Products can increase the amount of zeolite added.

5.5 Temperature measuring device Select a dropping point thermometer (model GB -28, No. 3) conforming to GB/T 514-2005, or a thermocouple capable of operating within the same temperature range. Work within the specified range and comply with the requirements of GB/T 16839.1.

5.6 Heating device Select a suitable electric heating jacket, and the heating intensity should

meet the heating rate and reflux rate requirements in section 8.1.

6 Samples

6.1 Preparation of Concentrated Samples The preparation of unused concentrated coolant samples shall be carried out according to the following steps.

- a) Remove the sample from the container and allow it to equilibrate to room temperature;
- b) Shake the container to mix any substances that may have separated into layers.
- c) Immediately measure the required sample for the test.

6.2 Preparation of diluted samples Thoroughly mix the sample, then use a pipette to transfer the required volume of sample into a calibrated volumetric flask. Add distilled water to dilute the mixture in the flask. Once the volume reaches the mark on the scale, allow it to reach room temperature.

6.3 Sample preparation containing leak-proof additives The sampling and preparation methods for engine coolant samples containing anti-leakage additives shall comply with SH/T 0065.

6.4 Sample preparation containing corrosion inhibitors The sampling and sample preparation methods for engine coolant samples containing corrosion inhibitors shall comply with SH/T 0065.

7 Preparation of Instruments and Apparatus

7.1 Insert the calibrated temperature measuring device into the angled insertion port of the flask, to a depth equal to the temperature of the thermometer bulb (or thermocouple temperature). The probe should be positioned

6.5 mm from the center of the bottom of the flask. A short piece of rubber tubing or other suitable material can be used to insert the temperature measuring device into the flask's angled insertion port. The material is sealed to prevent air leakage.

7.2 Measure 60 mL of the sample to be tested and pour it into a flask, then add 3 or 4 boiling stones.

7.3 Insert the clean, dry condenser into the flask and place it in a suitable electric heating mantle. Secure the upper part of the condenser to the iron support with a clamp. Connect latex tubing to the inlet and outlet of the condenser tube, and fill the condenser tube jacket with water.

8 Steps

8.1 After installation as shown in Figure 1, turn on the cooling water to start heating. Adjust

the heating rate so that the sample reaches boiling point within 15 minutes. Then slowly reduce the heating intensity until the desired reflux rate is achieved. Adjust the reflux rate to reach the desired level over the next 10 minutes. The flow rate should be maintained at 1 drop/s to 2 drops/s. To obtain accurate results, carefully observe the reflux rate and, after maintaining the reflux rate for 2 minutes, read the thermometer reading. Displays temperature value.

8.2 Record the observed temperature and atmospheric pressure.

9 Calculation

9.1 Calibration of temperature measuring device The temperature value (t) is obtained after calibration with a thermometer or thermocouple based on the temperature observed in 8.2.

9.2 Correction for atmospheric pressure difference After correcting the thermometer or thermocouple readings and observed temperature values for atmospheric pressure difference, calculate the pressure difference calibrated value according to formula (1). Correction value (C) after correction.

9.3 Calculation of Boiling Point The boiling point (T) after temperature and pressure correction is calculated according to formula (2).

10 Results indicate

10.1 The equilibrium boiling point of the sample after correction for thermometer readings and atmospheric pressure is accurate to 0.5°C .

10.2 The equilibrium boiling point of the sample after thermocouple reading correction and atmospheric pressure correction, with the result accurate to 0.1°C .

11 Precision This document provides separate statistics on the reproducibility of diluted and concentrated solutions.

a) Reproducibility of the diluent. For samples with a boiling point below 100°C , the difference between two results from different laboratories should not exceed 1.4°C ; for samples with a boiling point above 100°C , the difference should not exceed 1.4°C . The difference between two results from the same laboratory should not exceed 2.5°C .

b) Reproducibility of the concentrate. For samples with a boiling point below 100°C , the difference between two results from different laboratories should not exceed 1.4°C ; for samples with a boiling point above 100°C , the difference should not exceed 1.4°C . The difference between two results from the same laboratory should not exceed 5.6°C .

12 Reports The test report should include at least the following information.

a) Test methods;