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

SH/T 0066-2002

**Standard test method for foaming tendencies of engine
coolants in glassware
(English Translation)**

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1 Scope

1.1

This Standard specifies the method for determining the foaming tendencies of engine coolants using glassware under certain temperature and ventilation conditions controlled in the laboratory.

1.2 This Standard involves some hazardous materials, operations and equipment, but it does

not intend to make recommendations on all safety issues related to this. Therefore, users shall establish appropriate safety and protection measures and determine applicable management systems before using the standard.

2 Normative References

The following standards include provisions that constitute part of this Standard by reference.

Unless otherwise specified in the standard, the following referenced standards shall be the currently valid standards.

GB/T 6682 Water for analytical laboratory use - Specification and test methods

GB/T 12579 Determination of foaming characteristics of lubricating oils

SH/T 0065 Engine coolant for rust preventive agent test sample taking and preparation of aqueous solution

ASMT D 3585 Standard specification for ASTM reference fluid for coolant tests

3 Terms

For the purposes of this Standard, the follow terms apply.

3.1 Break time

The time from gas stop to foam bursting and until an "eye" appears on the liquid surface.

3.2 Eye

The bubble-free area surrounded by the foam attached to the wall of the measuring cylinder on the liquid surface.

4 Overview of Method

The mixed solution of coolant and water was kept at a constant temperature of $88^{\circ}\text{C} \pm 1^{\circ}\text{C}$; ventilated with a constant air flow for 5 min; and measure its foam volume and break time.

5 Meaning and Usage

In practice, this method is usually used to distinguish coolants with excessive foaming tendency in order to select coolants suitable for further analysis to determine their performance.

NOTE: During the use of the coolant, as time goes by or the coolant is contaminated, its foaming tendency shall increase. A certain pressure shall be maintained to inhibit the formation of foam in the coolant.

6 Instruments

6.1

Container

500mL graduated heat-resistant glass cylinder, the minimum scale is 5mL, the diameter is 45mm ~ 50mm, and the length is 380mm.

6.2

Water bath

4000mL glass container, which can at least immerse the 350mL scale line of the 500mL

measuring cylinder below the liquid surface.

6.3

Heater

An electric heater that can keep the bath temperature at $88^{\circ}\text{C}\pm 1^{\circ}\text{C}$.

6.4

Gas diffusion head

25.4mm in outer diameter; a sand core ball made of sintered crystalline alumina. The following conditions shall be met when measuring according to the Appendix A of GB/T 12579:

Maximum pore size/ μm : no more than 80

Permeability at 2.45kPa pressure/(mL/min): 3000~6400

6.5

Thermometer 1] meet the requirements of Appendix A, or use a common thermometer with a temperature range of $0^{\circ}\text{C}\sim 100^{\circ}\text{C}$ and a graduation value of 1°C .

6.6

Air source

A clean and dry air source that is free of grease and other pollution and can ensure the specified gas flow rate through the diffusion head.

6.7

Stopwatch

Graduation value 0.2s.

1] The thermometer specification in ASTM D 1881-97 is given in the Appendix A of this Standard; and add the provision to use domestic common thermometer.

7 Reagents and Materials

7.1

Purity of water

Unless otherwise specified, the water used in the standard is the Grade-2 water specified in GB/T 6682.

7.2

Acetone

Analytically pure, rinse and dry the test instrument.

WARNING: Acetone is highly flammable.

7.3 Reference coolant: Unless otherwise specified, the reference coolant refers to the coolant

without defoaming agent specified in ASTM D 3585.

7.4 Cleaning solution: refers to the acidic or alkaline cleaning solution used to clean glass containers between tests. It is selected according to the specific situation. For example, chromic acid cleaning solution and sodium (potassium) hydroxide alcohol solution are commonly used acidic and alkaline cleaning solutions, respectively.

WARNING: The cleaning solution is a strong oxidant or strong acid or alkali. Avoid contact with skin, eyes, and clothing. Do not inhale steam. It is best to operate in a ventilated cabinet.

8 Test Solution

8.1

Prepare a 33% (V/V) aqueous solution from the reference coolant concentrate.

8.2

Use the glass beaker used to prepare the reference coolant to prepare an aqueous solution containing 33% (V/V) concentrate from the coolant to be tested. Rinse the glass beaker with water before preparing the solution. Dilute the additive concentrate with water to the recommended concentration. Sampling and specimen preparation are carried out in accordance with SH/T 0065 to ensure that the prepared specimen contains all insoluble substances and is representative.

9 Test Conditions

9.1

Test temperature

During the test, the constant temperature water bath liquid level is maintained at the 350mL~375mL scale position of the measuring cylinder; and the test solution temperature is maintained at $88^{\circ}\text{C} \pm 1^{\circ}\text{C}$, which is suitable for both high-boiling point and low-boiling point coolants.

9.2

Air flow

Maintained at $1000\text{mL}/\text{min} \pm 25\text{mL}/\text{min}$.

9.3

Number of tests

The reference coolant is used to determine whether the used glassware and test