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

GB/T 9751.1-2008

**Paints and varnishes -- Determination of viscosity using rotary
viscometers -- Part 1: Cone-and-plate viscometer operated at a
high rate of shear**

(English Translation)

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Foreword

GB/T 9751 Paints and varnishes - Determination of viscosity using rotary viscometers is divided into four parts.

- Part 1.Cone-and-plate viscometer operated at a high rate of shear;
- Part 2.Disc or ball viscometer operated at a single specified speed;
- Part 3.Disc and spindle viscometer operated at different speeds;
- Part 4.Paddle viscometer operated at a single specified speed.

This part is Part 1 of GB/T 9751.

This part is identical to ISO 2884-1.1999 Paints and varnishes - Determination of viscosity using rotary viscometers - Part 1.Cone-and-plate viscometer operated at a high rate of shear (English version).

For ease of use, the following editorial changes have been made to ISO 2884-1.1999.

- This part deletes the Foreword and References of the international standard.

This part replaces GB/T 9751-1988 Determination of viscosity of coatings at a high rate of shear.

The main technical differences between this part and the previous version GB/T 9751-

1988 are.

-- The standard has been changed into a series of standards; this part is Part 1, and the name has been changed to "Paints and varnishes - Determination of viscosity using rotary viscometers - Part 1.Cone-and-plate viscometer operated at a high rate of shear";

-- The applicable shear rate range has been narrowed from 5000 s⁻¹~20000 s⁻¹ to

9000 s⁻¹~12000 s⁻¹;

-- The cylinder type viscometer and the immersion type viscometer have been cancelled;

-- The requirement that the test specimen must be filtered through a sieve with an aperture of 125 µm before testing has been cancelled, but it is required that there shall be no foreign impurities or lumps in the test specimen;

-- Appendix A (Informative) has been added.

Paints and varnishes - Determination of viscosity using
rotary viscometers - Part 1.Cone-and-plate viscometer
operated at a high rate of shear

1 Scope

This part is one of a series of standards related to sampling and testing of paints, varnishes and related products.

This part is a supplement to GB/T 6753.4-1998 Paints and varnishes - Determination of flow time by use of flow cups.

This standard specifies the general procedure to be followed when determining the dynamic viscosity of paints, varnishes and related products at shear rates in the range of 9000 s⁻¹~12000 s⁻¹.

The measured values can provide information about the resistance generated by the material during the construction process, such as brushing, spraying and rolling.

The method described in this part is applicable to all paints and varnishes, whether Newtonian or not. Materials containing large particle dispersions will give unrealistic results.

2 Normative references

The clauses in the following documents become the clauses of this part through reference in this part. For all the referenced documents with dates, all the subsequent amendments (excluding errata) or revisions are not applicable to this part. However, the parties who reach an agreement based on this part are encouraged to study whether the latest versions of these documents can be used. For all the referenced documents without dates, the latest versions are applicable to this part.

GB/T 3186 Paints, varnishes and raw materials for paints and varnishes - Sampling (GB/T 3186-2006, ISO 15528.2000, IDT)

GB/T 20777 Paints and varnishes - Examination and preparation of samples for testing (GB/T 20777-2006, ISO 1513.1992, IDT)

test can be carried out according to the steps listed in Chapter 7 using the standard oil with the highest viscosity indicated by the instrument reading.

After the instrument has been allowed to measure the standard oil continuously for 5 min, the reading shall not drop by more than 10%. If the drop exceeds 10%, the instrument is considered unsuitable for measuring viscosity at high shear rates in accordance with the requirements of this standard.

7.1 After preheating the instrument according to the manufacturer's instructions, immediately perform parallel measurements on the test specimen prepared according to Chapter 4, according to the following steps.

If it is necessary to compare the viscosity of the products, the test shall be carried out at the same shear rate. Unless otherwise agreed, the test shall be carried out at $(23 \pm 0.2) ^\circ\text{C}$.

7.2 Adjust the fixed part of the viscometer to (23 ± 0.2) °C or other agreed temperature.

Take an appropriate amount of the test specimen to the appropriate part of the viscometer, and avoid introducing bubbles when adding the test specimen. Adjust the other parts of the instrument to the correct position. According to the requirements of the instrument used, leave it for the specified time until the test specimen reaches the agreed temperature.

7.3 Start the rotor and record the reading when the data shows stable. If the reading is

still not stable after 15 seconds, record the reading at 15 seconds and indicate in the test report that there is no stable reading.

7.4 If the reading does not directly represent the viscosity, multiply the reading by an

appropriate conversion factor or use an appropriate calibration curve to obtain the viscosity.

8 Cleaning of instruments

After each measurement, carefully clean the stator and rotor with a suitable solvent. The procedure depends on the instrument used, but be sure to remove all the test materials and the cleaning solvent. Cleaning utensils that will damage the equipment shall not be used, and metal cleaning tools must never be used.

9 Precision

When the same operator uses the same instrument in the same laboratory, the difference

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