

ICS 87.040

CCS G 51



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

GB/T 1768-2006

**Paints and varnishes -- Determination of resistance to abrasion
-- Rotating abrasive rubber wheel method**

色漆和清漆 耐磨性的测定 旋转橡胶砂轮法

(English Translation)

Issued on: December 29, 2006

Implemented on: June 1, 2007

**Issued by: General Administration of Quality Supervision, Inspection and
Quarantine of PRC**

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1 Scope

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

This standard specifies a test method for the determination of the abrasion resistance of dry films of paints, varnishes or related products, using a rubber grinding wheel, through rubbing with the rotating motion of the rubber grinding wheel.

2 Normative references

The provisions in following documents become the provisions of this Standard through reference in this Standard. For the dated references, the subsequent amendments (excluding corrections) or revisions do not apply to this Standard; however, parties who reach an agreement based on this Standard are encouraged to study if the latest versions of these documents are applicable. For undated references, the latest edition of the referenced document applies.

GB/T 3186 Paints, varnishes and raw materials for paints and varnishes - Sampling (GB/T

3186-2006, ISO 15528:2000, IDT)

GB/T 9271 Paints and varnishes - Standard panels for testing (GB/T 9271-1988, eqv ISO 1514:1984)

GB/T 13452.2 Paints and varnishes - Determination of film thickness (GB/T 13452.2-1992, eqv ISO 2808:1974)

GB/T 20777 Paints and varnishes - Examination and preparation of samples for testing (GB/T 20777-2006, ISO 1513:1992, IDT)

3 Principles

Under specified conditions, use a rubber grinding wheel fixed on the abrasion tester to rub the dry paint film of paint or varnish. During the test, a weight of specified weight must be added to the rubber grinding wheel. Wear resistance is expressed by the mass loss of the paint film, after a specified number of friction cycles, OR by the number of cycles required to remove this course of coating to the next course of coating or substrate.

4 Supplementary information required

For any particular application, the test methods specified in this standard need to be completed with supplementary information. The terms of the supplementary information are set out in Appendix A.

5 Instruments

5.1

Abrasion tester, consisting of the components described in 5.1.1 to 5.1.4 (see Figure 1).

5.1.1

The turntable, which can rotate at a speed of (60 ± 2) r/min; the test panel can be centered on the turntable and firmly fixed.

5.1.2 Two rubber grinding wheels

1) , each rubber grinding wheel is (12.7 ± 0.1) mm thick.

Install the two rubber grinding wheels on the horizontal rotating shaft, respectively;

they can rotate freely around the rotating shaft. The distance between the inner surfaces of the two rubber grinding wheels is (53.0 ± 0.5) mm. The assumed distance -- between the axis passing through the two rotating shafts and the central axis of the turntable -- is $(19.1 \pm$

0.1) mm. The outer diameter of the new rubber grinding wheel is (51.6 ± 0.1) mm. The outer diameter of the rubber grinding wheel shall not be less than 44.4 mm, under any circumstances.

The selection of rubber grinding wheel model shall be agreed upon by the parties concerned.

Since the rubber bonding material of the rubber grinding wheel gradually hardens, its hardness shall be checked to see if it meets the technical requirements specified by the manufacturer. The rubber grinding wheel may no longer be used if the manufacturer's expiration date marked on the rubber grinding wheel has passed, OR if more than one year has passed since the date of purchase, if no expiration date was given.

According to the wear and tear of the paint product during use, select three types of rubber grinding wheels from

Taber Industries in the United States: CS-10F, CS-10, CS-17, or rubber grinding wheels with agreed abrasion effects equivalent to them.

1.5 kPa

2)

~ 1.6 kPa lower than the atmospheric pressure.

5.2 Weight, which can gradually increase the load on each rubber grinding wheel, up to a maximum of 1 kg.

5.3 Reconditioning media, in the form of friction discs, is used to recondition rubber grinding wheels.

Note: Different reconditioning media shall be selected according to different rubber grinding wheels.

5.4 Calibration plate, which has a thickness of $(0.8 \sim 1)$ mm, is used for instrument calibration (see Appendix B).

5.5 Balance, accurate to 0.1 mg.

6 Sampling

According to the provisions of GB/T 3186, take a representative sample of the product under test (or each product in a multi-coating system).

Inspect and prepare test samples, according to the provisions of GB/T 20777.

7.1 Substrate

Unless otherwise agreed, the substrate shall be selected in accordance with the provisions of GB/T 9271. If possible, the same type of material as that used in actual use shall be

selected. The substrate of the test panel shall be flat and without deformation; otherwise, the abrasion of the coating under test will be uneven.

7.2 Shape and dimensions

The shape and size of the test panel shall enable the test panel to be correctly fixed on the instrument. There shall be a hole with a diameter of 6.35 mm in the center of the test panel.

Note: The commonly used test panel size is 100 mm x 100 mm or $\phi 100$ mm.

7.3 Treatment and painting

Unless otherwise agreed, each test panel shall be treated according to the provisions of GB/T 9271. Then the tested product or product system shall be painted according to the 1 kpa - 10 mbar.

prescribed method.

7.4 Drying and conditioning

Each painted test panel is dried (or baked) under specified conditions and left, if applicable, for a specified period of time.

7.5 Thickness of coating

Determine the dry film thickness according to a method specified in GB/T 13452.2, expressed in μm .

8.1 Test conditions

Unless otherwise agreed, tests are carried out under the conditions of temperature (23 ± 2) and relative humidity (50 ± 5)%.

8.2 Calibration of instrument

Calibrate the instrument (an example of the calibration procedure is given in Appendix B).

8.3.1 Check whether the rubber grinding wheel meets the requirements specified in

5.1.2.

8.3.2 To ensure that the abrasive effect of the rubber grinding wheel is maintained at a constant level, prepare the rubber grinding wheel in accordance with the manufacturer's