

Translated English of Chinese Standard: GB/T1771-2007

www.ChineseStandard.net → Buy True-PDF → Auto-delivery.

Sales@ChineseStandard.net

GB

NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA

ICS 87.040

G 50

GB/T 1771-2007 / ISO 7253:1996

Replacing GB/T 1771-1991

**Paints and varnishes - Determination of resistance to neutral
salt spray (fog)**

色漆和清漆 耐中性盐雾性能的测定

(ISO 7253:1996, IDT)

Issued on: September 11, 2007

Implemented on: April 01, 2008

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

Table of Contents

Foreword.....	3
1 Scope	5
2 Normative references.....	5
3 Principle.....	6
4 Information to be supplemented.....	6
5 Test solution	6
6 Instruments and equipment.....	7
7 Sampling	8
8 Test sample.....	8
9 Exposure method of test panel	10
10 Operating conditions.....	10
11 Procedure.....	11
12 Inspection of test panels	11
13 Precision.....	11
14 Test report.....	12
Appendix A (Normative) Information to be supplemented	13
Appendix B (Normative) Factors to be considered in the design and construction of salt spray chambers, which have a volume greater than 2 m ³ (see 6.1).....	14
Appendix C (Normative) Calibration of equipment (see 6.7).....	15

Paints and varnishes - Determination of resistance to neutral salt spray (fog)

1 Scope

This standard specifies a method for determining the resistance of coatings to neutral salt spray.

The methods, which are specified in this standard, can be used as a means of testing the quality of paint or coating systems.

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 3186-2006 Paints varnishes and raw materials for paints and varnishes - Sampling (ISO 15528:2000, IDT)

GB/T 6682 Water for laboratory use - Specifications (GB/T 6682-1992, neq ISO 3696:1987)

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

GB 9278 Temperatures and humidities for conditioning and testing of paint specimens (GB 9278-1988, eqv ISO 3270:1984, Paints and varnishes and their raw materials - Temperatures and humidities for conditioning and testing)

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

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

ISO 3574:1999 Cold-reduced carbon steel sheet of commercial and drawing qualities

ISO 4628-1:2003 Paints and varnishes - Evaluation of degradation of paint coatings - Designation of intensity, quantity and size of common types of defect - Part 1: General principles and rating schemes

ISO 4628-2:2003 Paints and varnishes - Evaluation of degradation of coatings - Designation of quantity and size of defects, and of intensity of uniform changes in appearance - Part 2: Assessment of degree of blistering

ISO 4628-3:2003 Paints and varnishes - Evaluation of degradation of coatings - Designation of quantity and size of defects, and of intensity of uniform changes in appearance - Part 3: Assessment of degree of rusting

ISO 4628-4:2003 Paints and varnishes - Evaluation of degradation of coatings - Designation of quantity and size of defects, and of intensity of uniform changes in appearance - Part 4: Assessment of degree of cracking

ISO 4628-5:2003 Paints and varnishes - Evaluation of degradation of coatings - Designation of quantity and size of defects, and of intensity of uniform changes in appearance - Part 5: Assessment of degree of flaking

3 Principle

Expose the painted test panels to neutral salt spray. The results of salt spray exposure are assessed, using principles or standards, which are pre-agreed by the parties concerned.

4 Information to be supplemented

For any particular application, the test methods specified in this standard need to be complemented by supplementary information, the items of which are listed in Appendix A.

5 Test solution

5.1 Preparation of test solution: Dissolve sodium chloride in water, which has a purity of at least grade 3, as specified in GB/T 6682, AND a mass concentration of (50 ± 5) g/L. Sodium chloride shall be white, which has a mass fraction of $\geq 99.5\%$; it is basically free of copper and nickel; the mass fraction of sodium iodide shall be $\leq 0.1\%$.

5.2 The pH of the test solution (5.1) shall be adjusted, so that the pH of the spray solution, which is collected in the test chamber (see Chapter 6), is between 6.5 and 7.2. When it exceeds the range, it can be adjusted, by adding analytically pure hydrochloric acid or sodium bicarbonate solution.

Note: It shall be noted that the pH value may change, due to the loss of carbon dioxide in the test solution, during spraying. This change can be avoided, by reducing the carbon dioxide content of the solution, for example, by heating the solution to above 35 °C OR using freshly boiled water, before adding the solution to the instrument.

5.3 The test solution shall be filtered, before being injected into the storage tank of the instrument, to prevent solid matter from clogging the nozzle.

6 Instruments and equipment

The equipment is a salt spray test chamber, which shall include the following components.

6.1 The salt spray chamber shall be made of OR lined with materials, which are resistant to corrosion by salt water solutions. It shall be provided with a cover, to prevent condensation from dripping onto the test panel. In order to ensure uniform distribution of spray, the volume of the chamber shall not be less than 0.4 m³.

The size and shape of the salt spray chamber shall be such, that the volume of solution collected by the spray collector (6.4), is within the limits specified in 10.2.

For the salt spray chamber, which has a volume greater than 2 m³, it shall be carefully considered, in design and construction for ease of operation. Factors, that shall be considered, are listed in Appendix B.

6.2 For the thermostatic control element, the temperature shall be controlled by the thermostatic element in the chamber, so that the components, in the salt spray chamber, are kept within the specified temperature range (see 10.1). The element shall be at least 100 mm from the chamber wall. The thermometer shall be placed in the chamber as a whole; its distance from the four walls, the top of the chamber and the end of the chamber shall be more than 100 mm; meanwhile it shall be able to read from outside the chamber.

6.3 The spraying device shall consist of a compressed air supply, a storage tank for spraying solution, one or more nozzles which are made of materials resistant to corrosion by salt water. The compressed air supplying the spray shall pass through the filter, to remove oil and solid particles. The pressure shall be maintained at (70 ~ 170) kPa. The air shall be humidified, by passing through a saturated column, which is filled with water, before entering the nozzles. The filling water shall be at least grade 3 water, as specified in GB/T 6682; its temperature is several degrees Celsius higher than that of the salt spray chamber. The temperature of the water depends on the air pressure used AND the type of nozzles used. Adjust the air pressure, to keep the recovery rate in the tank and the concentration of the collected solution, within the specified limits (see 10.2).

Unless otherwise specified or agreed upon, the test sample shall use a substrate, that complies with the provisions of GB/T 9271, AND has a size of about 150 mm × 100 mm × 1 mm.

Note: The size of the test panel can also be 150 mm × 100 mm × (0.8 ~ 1.5) mm or 150 mm × 70 mm × (0.8 ~ 1.5) mm.

8.2 Handling and painting of test panels

Unless otherwise agreed, each test panel shall be treated, in accordance with the provisions of GB/T 9271, then coated with the product or system to be tested, in accordance with the prescribed method.

Unless otherwise specified, the back and edges of the panels are also coated with the product or system to be tested.

If the coating on the back and edges of the test panel is different from that of the product being tested, it shall have better corrosion resistance than the product being tested.

8.3 Drying and state conditioning

The coated test panel shall be dried, according to the time and conditions, which are specified in the standard. Unless otherwise specified, it shall be subject to state conditioning, at a temperature of $(23 \pm 2) ^\circ\text{C}$ and relative humidity $(50 \pm 5)\%$, with air circulation, without direct sunlight exposure, for at least 16 h. Then carry out the test, as soon as possible.

8.4 Coating thickness

Use one of the non-destructive methods, which are specified in GB/T 13452.2, to determine the thickness of the dry coating, in μm .

8.5 Making of scratches

If scratches are required, all scratches shall be at least 25 mm from each edge of the test panel, AND the scratches between each other shall be at least 25 mm.

Scratches shall be straight lines, through the coating to the substrate.

Use a scratching tool, which has a hard tip, when scratching. The scratches shall have parallel sections on both sides OR a widened section at the top. The width of scratches, on metal substrates, is 0.3 mm ~ 1.0 mm, unless otherwise specified.

One or two scratches can be drawn. Unless otherwise specified, the scratches shall be parallel to the long edge of the test panel.

Scratches are not allowed, by using the tools such as scalpels, razors, knives, needles, etc.

For the aluminum plate substrate, the two scratches shall be perpendicular to each other but not cross. One scratch shall be parallel to the rolling direction of the aluminum sheet; the other scratch shall be at a perpendicular angle, to the rolling direction of the aluminum sheet.

Note: If galvanized sheet or galvanized alloy steel is used, the result of scratching to the zinc coating will be different from that of the metal substrate. The parties concerned shall agree on the extent, to which the scratch will break the coating and plating.

9 Exposure method of test panel

9.1 The test panel shall not be placed on the straight trajectory of the mist particles, which are coming out of the nozzle.

9.2 The tested surface of each test panel shall face upward; the included angle with the vertical line shall be $20^{\circ} \pm 5^{\circ}$.

Note: The placement angle of each panel, which is exposed to the salt spray chamber, is important.

When the painted workpieces of different shapes are tested, the exposure method shall be agreed upon by the parties concerned. When conducting such tests, it is especially important that these differently shaped parts are placed in their normal state. Under this requirement, components shall be placed, as far as possible to avoid impeding the flow of air. If the part obstructs the flow of air, other panels and parts cannot be tested at the same time.

Due consideration shall be given to the degree of damage to the coating of the test panel, which varies with the orientation in which it is placed.

9.3 The arrangement of the test panels shall not make them contact each other or the chamber. The tested surface shall be exposed to the place, where the salt spray can settle unhindered.

10 Operating conditions

10.1 The temperature in the salt spray chamber shall be $(35 \pm 2)^{\circ}\text{C}$.

10.2 For a horizontal spray collection device, which has an area of 80 cm^2 , the average collection rate of the salt spray solution, which is measured at a minimum period of 24 h, shall be $1\text{ mL/h} \sim 2.5\text{ mL/h}$.

The sodium chloride concentration of the collected solution shall be $(50 \pm 10)\text{ g/L}$. The pH value shall be $6.5 \sim 7.2$ (see 5.2).

Appendix C

(Normative)

Calibration of equipment (see 6.7)

C.1 Overview

For the purpose of quality assurance (e.g., when using the ISO 9000 series of international standards), it is necessary to carry out an evaluation of the interrelationship of all experimental equipment, in order to determine the corresponding relationship, between the coating system and the test methods described in this standard. Whether the results are not reproduced OR the extent of damage is reproduced, if the coating or coating system is exposed under separate test runs BUT under the same test conditions.

In the case of very large or human-accessible salt spray chambers, it is necessary to determine that, any position within the exposure volume is equivalent to the performance or to the same degree of damage, with the same test panel.

It is necessary to assess the reproducibility by the following method: make a certain number of identically prepared reference panels, subject to the same exposure, over a specified period of time, AND adjust the operating parameters within this national standard to obtain reproducibility.

C.2 Reference test panel

C.2.1 The reference test panel shall be grade CR4 steel panel, which conforms to ISO 3574:1999; has a size of about 150 mm × 75 mm AND a thickness of (1 ± 0.2) mm.

C.3 Preparation of reference test panels

C.3.1 Treat the reference test panel, by the grinding method, which is specified in GB/T 9271.

C.3.2 Carefully clean the reference panel, by a soft brush or ultrasonic cleaning device, using a suitable organic solvent, immediately before the test. Use the solvent to rinse it again; allow it to dry.

Note 1: Hydrocarbon solvents, which have a boiling range of 60 °C ~ 120 °C, are suitable.

Note 2: If the results are equivalent, other cleaning methods agreed by the parties may also be used.

C.3.3 Weigh the reference test panel, accurate to 1 mg.

C.3.4 Protect the back of the reference panel, by a self-adhesive waterproof foil.

C.4 Procedure

This is an excerpt of the PDF (Some pages are marked off intentionally)

Full-copy PDF can be purchased from 1 of 2 websites:

1. <https://www.ChineseStandard.us>

- SEARCH the standard ID, such as GB 4943.1-2022.
- Select your country (currency), for example: USA (USD); Germany (Euro).
- Full-copy of PDF (text-editable, true-PDF) can be downloaded in 9 seconds.
- Tax invoice can be downloaded in 9 seconds.
- Receiving emails in 9 seconds (with download links).

2. <https://www.ChineseStandard.net>

- SEARCH the standard ID, such as GB 4943.1-2022.
- Add to cart. Only accept USD (other currencies - <https://www.ChineseStandard.us>).
- Full-copy of PDF (text-editable, true-PDF) can be downloaded in 9 seconds.
- Receiving emails in 9 seconds (with PDFs attached, invoice and download links).

Translated by: Field Test Asia Pte. Ltd. (Incorporated & taxed in Singapore. Tax ID: 201302277C)

About Us (Goodwill, Policies, Fair Trading...): <https://www.chinesestandard.net/AboutUs.aspx>

Contact: Wayne Zheng, Sales@ChineseStandard.net

Linkin: <https://www.linkedin.com/in/waynezhengwenrui/>

----- The End -----