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Replacing GB/T 9755-2001

Synthetic resin emulsion coatings for exterior wall

合成树脂乳液外墙涂料

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Table of Contents

Foreword	3
1 Scope	5
2 Normative references	5
3 Product classification and grading	6
4 Requirements	6
5 Test method.....	8
6 Inspection rules	15
7 Marking, packaging, storage	16
Appendix A (Normative) Test method for salt and alkaline resistance.....	17
Appendix B (Normative) Water permeability test method	20
Appendix C (Normative) Test method for scrubbing resistance.....	22

Synthetic resin emulsion coatings for exterior wall

1 Scope

This standard specifies the product classification, grading, requirements, test methods, inspection rules and marking, packaging and storage of synthetic resin emulsion coatings for exterior wall.

This standard applies to exterior wall coatings that are made of synthetic resin emulsion as the base material, pigments, body pigments (primers may not add pigments or body pigments) and various additives; it can form a thin coating with a smooth surface after application, including primers, midcoats, topcoats. This coating is suitable for decoration and protection of the outer surfaces of buildings and structures.

2 Normative references

The following documents are essential to the application of this document. For the dated documents, only the versions with the dates indicated are applicable to this document; for the undated documents, only the latest version (including all the amendments) is applicable to this standard.

GB/T 1728-1979 Methods of test for drying time of coatings of paints and putties

GB/T 1733-1993 Determination of resistance to water of films

GB/T 1766 Paints and varnishes - Rating schemes of degradation of coats

GB/T 1865-2009 Paints and varnishes - Artificial weathering and exposure to artificial radiation - Exposure to filtered xenon-arc radiation

GB/T 1910 Newsprint

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

GB/T 6682-2008 Water for analytical laboratory use - Specification and test methods

GB/T 6750 Paints and varnishes - Determination of density - Pycnometer method

GB/T 8170-2008 Rules of rounding off for numerical values and expression and judgement of limiting values

GB/T 9265 Determination for alkali resistance of film of architectural paints and

coatings

GB/T 9268-2008 Determination of freeze-thaw resistance of latex and emulsion paints

GB/T 9271-2008 Paints and varnishes standard panels for testing

GB/T 9278 Temperatures and humidity for conditioning and testing of paint specimens

GB/T 9286 Paints and varnishes - Cross cut test for films

GB/T 9750 Marks for package of coating products

GB/T 9780-2013 Test method for dirt pickup resistance and stain removal of film of architectural coatings and paint

GB/T 13491-1992 General rule for packing of coatings

GB/T 15608 The Chinese color system

GB/T 16422.3-1997 Plastics - Methods of exposure to laboratory light sources - Part 3: Fluorescent UV lamps

GB/T 23981 Determination of contrast ratio of white and light colored paints

HG/T 3001-1999 Iron blue pigments

JC/T 412.1-2006 Fiber cement flat sheets - Part 1: Non-asbestos fiber cement flat sheets

JG/T 25 Determination for freeze-thaw resistance of film of building coatings

3 Product classification and grading

This standard divides synthetic resin emulsion coatings for exterior wall into three categories: primer, midcoat, topcoat.

Topcoat is divided into three grades according to the use requirements: superior grade, first-grade, qualified grade. Primer is divided into Type I and Type II according to the requirements of salt and alkali resistance and impermeability.

4 Requirements

4.1 Primer shall meet the requirements of Table 1.

mix evenly, it is evaluated as qualified.

5.5 Workability

5.5.1 Primer workability

Apply the specimen on the smooth surface of the test board with a brush. If the brush runs smoothly, it is evaluated as "no difficulty in brushing".

5.5.2 Workability of midcoat and topcoat

Apply the specimen on the smooth surface of the test board with a brush. The coating amount is about 100 µm wet film thickness. The long side of the test board is horizontal; the short side is placed vertically at an angle of about 85° to the horizontal plane. After 6 hours of placement, apply the second coat of the specimen in the same way. When the brush runs smoothly during the second coat, it can be evaluated as "no difficulty in brushing the second coat".

5.6 Low temperature stability

Perform the test for 3 cycles according to Method A in GB/T 9268-2008.

5.7 Appearance of coating film

After the test in 5.5, place the test board for 24 hours and visually observe the coating film. If there is no obvious shrinkage and sagging, meanwhile the coating film is uniform, it is evaluated as "normal".

5.8 Drying time

It is carried out according to the provisions of surface drying method B in GB/T 1728-1979.

5.9 Alkali resistance

It is carried out according to the provisions of GB/T 9265. If 2 of the 3 test boards do not show blistering, powdering, obvious discoloration and other coating damage phenomena, it can be evaluated as "no abnormality". If the above damage phenomena occur, describe it according to GB/T 1766.

5.10 Water resistance

It is carried out according to the provisions of method A in GB/T 1733-1993. In addition to edge sealing, the back of the test board must be sealed before the test. Immerse the 3 test boards in the grade-3 water specified in GB/T 6682. If 2 of the 3 test boards do not show blistering, powdering, obvious discoloration and other coating damage phenomena, it can be evaluated as "no abnormality". If the above coating damage phenomena occur, describe it according to GB/T 1766.

5.11 Salt and alkali resistance

For the test of salt and alkali resistance, see Appendix A.

5.12 Water permeability

For the test of water permeability, see Appendix B.

5.13 Adhesion

It is carried out according to the provisions of GB/T 9286. Use a single-edged knife to cut 3 parallel lines along the long side of the sample in the parallel and vertical directions, with a spacing of 3 mm and a grid number of 4, to conduct a tape tear test.

5.14 Contrast ratio

It is carried out according to the provisions of GB/T 23981; the arbitration test uses the polyester film method.

5.15 Scrubbing resistance

It is carried out according to the provisions of Appendix C.

5.16 Artificial weathering resistance

The test is carried out according to the provisions of Cycle A in GB/T 1865-2009. The evaluation of the results is carried out according to GB/T 1766.

5.17 Stain resistance

Perform two cycles of the test according to the provisions of Chapter 5 of GB/T 9780-2013 "The test method for stain resistance of exterior walls - Brushing method B (fast oven). For some exterior wall paint samples, when testing stain resistance, after consultation with the relevant parties, the test boards are allowed to be tested after 7 days of curing and then irradiated with ultraviolet light for 4 hours (ultraviolet light irradiation is carried out in accordance with GB/T 16422.3-1997, exposure method 1, the light source is UV-A340 lamp tube).

5.18 Temperature change resistance of coating

According to the provisions of JG/T 25, 3 cycles are performed [18 hours of immersion in (23 ± 2) °C water, 3 hours of freezing at (-20 ± 2) °C, 3 hours of hot baking at (50 ± 2) °C as one cycle]. If at least 2 of the 3 test boards shall not show any coating damage phenomena such as powdering, cracking, blistering, peeling, obvious discoloration, etc., it can be evaluated as "no abnormality". If the above coating damage phenomena occur, describe them in accordance with GB/T 1766.

5.19 Adaptability with the next coat

Appendix A

(Normative)

Test method for salt and alkaline resistance

A.1 Main materials and instruments

A.1.1 Preparation of PVA-iron blue water dispersion

A.1.1.1 Preparation of 2% PVA (powdered polyvinyl alcohol 1788) aqueous solution

Add water to the container according to the calculated amount; slowly add powdered polyvinyl alcohol 1788 under high-speed stirring; continue to stir at high speed after the polyvinyl alcohol is added (stir for at least 1 hour). When there are no lumps or blocks in the solution, the material can be discharged. After filtering through a 177 μm filter, it shall be left to stand under the test environment specified in 5.2 for use. The storage period shall not exceed 1 month.

A.1.1.2 Preparation of PVA-iron blue aqueous dispersion

Add 2% PVA aqueous solution (see A.1.1.1) into the container according to the calculated amount; slowly add LA09-03 iron blue pigment that meets the requirements of HG/T 3001-1999 while stirring; the mass ratio of 2% PVA aqueous solution (see A.1.1.1) to iron blue pigment is 4:1; stir at high speed for about 10 min ~ 15 min, until uniform; let it stand for 12 h under the test environment specified in 5.2 before use; the storage period shall not exceed 1 month. Iron blue pigment should be supplied in a unified manner to ensure its quality.

A.1.2 Preparation of test solution

Anti-salt-alkalinity test solution: NaOH, Ca(OH)₂, CaCl₂ mixed solution.

Prepare a mixed solution of NaOH, Ca(OH)₂, CaCl₂ according to the ratio of NaOH:Ca(OH)₂:CaCl₂:water = 2:2:0.012:96 (mass ratio), one day before the test [Ca(OH)₂ has reached supersaturation and precipitation will occur. The mixed solution does not need to be filtered and can be directly used for testing]. Place it in a closed container. Place it overnight under the test environment specified in 5.2, to ensure that the solution temperature reaches the standard conditions.

A.1.3 Test substrate

The substrate is a medium-density flat plate made of non-asbestos fiber reinforced cement. The density of the test board is $(1.2 \pm 0.1) \times 10^3 \text{ kg/m}^3$; the thickness of the test board is $(6 \pm 0.5) \text{ mm}$. The medium-density flat board made of non-asbestos fiber reinforced cement should be supplied in a unified manner to ensure its quality. Remove

Appendix C

(Normative)

Test method for scrubbing resistance

C.1 Scope of application

Applicable to the determination of scrubbing resistance of architectural coatings that can be made into flat coatings.

C.2 Test environment

The state conditioning of the test board and the temperature and humidity of the test shall comply with the provisions of GB/T 9278.

C.3 Instruments

C.3.1 Scrubbing resistance tester

An instrument that can make a brush move back and forth on the coating surface of the test sample and scrub the coating. The brush movement frequency is (37 ± 2) reciprocating cycles per minute; the distance of one reciprocating stroke is $300 \text{ mm} \times 2$. The area in the middle of 100 mm is roughly uniform motion.

C.3.2 Auxiliary equipment

C.3.2.1 Brush

Evenly punch (60 ± 1) small holes with a diameter of about 3 mm on a $90 \text{ mm} \times 38 \text{ mm} \times 25 \text{ mm}$ hardwood board (or plastic board); plant black pig bristles vertically in the holes; cut them flat at right angles to the bristles; the bristles are about 19 mm long. The total mass of the fixture and brush is (450 ± 10) g.

Before use, immerse the bristles in (23 ± 2) °C water for 30 min; take them out and shake off the water; then immerse 12 mm of the bristles in the washing medium that meets the requirements of C.4 for 20 min. The brush can only be used after this treatment.

When the bristles are worn to a length of less than 16 mm, the brush must be replaced.

C.3.2.2 Glass plate, about 6 mm thick, its length and width match the chassis size of the washability tester.

C.3.2.3 PVC sheet, 12.7 mm wide, 0.25 mm thick, its length matches the width of the glass plate in C.3.2.2.

C.3.2.4 Wet film preparation device, made of stainless steel, with a gap depth of 200

crusts and particles. Place a black plastic sheet (see C.3.2.6) on a glass plate or other flat plate; use a wet film preparation device (see C.3.2.4) to scrape one line on the black plastic sheet (see C.3.2.6). Prepare two test boards in total. The scraping speed shall be quite slow, which takes 3 s ~ 4 s from one end to the other to avoid forming pinholes in the paint film. Place the test board horizontally and cure it for 7 days under the test environment specified in 5.2.

C.5.2 Measurement

C.5.2.1 Perform two parallel measurements.

C.5.2.2 Place the clean glass plate (see C.3.2.2) in the bottom plate of the scrubber. Place a thin sheet (see C.3.2.3) on the glass plate (see C.3.2.2) perpendicular to the running track of the brush. Make sure that the thin sheet (see C.3.2.3) is smooth and has no burrs. Place the test board (see C.5.1) on the glass plate (see C.3.2.2) with the thin sheet, with the coating facing up. The thin sheet shall be located in the middle of the test board and make sure that the coating above the thin sheet has no defects and the test area is flat. Place the fixed frame (see C.3.2.5) on the test board (see C.5.1) to fix the test board. Clamp the fixed frame (see C.3.2.5) with the clamps at both ends of the scrubber. The clamps on both sides of the scrubbing instrument are used to fix the frame (see C.3.2.5); the clamps shall be sufficiently sealed to ensure that the fixation frame (C.3.2.5) and the test board (see C.5.1) are in close contact; however, it shall be not too tight to cause the test board (see C.5.1) to be distorted.

C.5.2.3 Before the test, use a soft paint brush to evenly apply the scrubbing medium (see C.4) on the coating surface; let the liquid contact the coating for 60 seconds. Place the pretreated brush on the coating surface of the test sample; keep the brush hanging naturally. Start the instrument to scrub the coating back and forth. During scrubbing, drip the scrubbing medium (see C.4) at a rate of about 0.04 mL per second to keep the scrubbing surface moist.

C.5.2.4 Perform a specified number of scrubbing cycles (2000 or 1000 cycles), to observe the removal of the paint film on the 12.7 mm wide sheet after the specified number of scrubbing tests. If the paint film on the sheet is removed as a continuous thin line and the length of the thin line exceeds the width of the sheet, it is judged to be damaged.

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