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

GB/T 20623-2025

Replacing GB/T 20623-2006

Emulsions for architectural coatings

建筑涂料用乳液

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1 Scope

This Document specifies the product classification, requirements, test methods, inspection rules, packaging, marking, and storage of emulsions for architectural coatings.

This Document applies to emulsions that act as film-forming binders in interior and exterior wall coatings; and are produced by emulsion polymerization of monomers such as styrene, acrylic acid and its esters, methacrylic acid and its esters, vinyl acetate, and other alkenes; using water as the dispersion medium.

2 Normative References

GB/T 528
GB/T 1725
GB/T 1727
GB/T 2794
GB/T 3186
GB/T 5206
GB/T 6682
GB/T 6750

GB/T 8170

GB/T 9267

GB/T 9268-2008

GB/T 9278

GB/T 9750

GB/T 12806

GB/T 12808

GB/T 18012

GB/T 20777

GB/T 23986.2-2023

GB/T 23990-2009

GB/T 23993

GB/T 31414

GB/T 41953

ISO 23529

3 Terms and Definitions

For the purposes of this Document, the terms and definitions given in GB/T 5206 apply.

4 Product Classification

4.1 Products are classified according to function as follows.

- General Purpose;
- Flexible.

4.2 Products are classified according to application as follows.

- Class A, Emulsions for topcoat varnishes;
- Class B, Emulsions for other applications.

5 Requirements

The product shall meet the technical requirements of Table 1. Table 1 - Requirements

6.1 Sampling

Sampling shall be performed according to the provisions of GB/T 3186, or according to an agreed method. The sampling quantity shall be determined according to the test requirements.

Each specimen shall be inspected and prepared according to the provisions of GB/T 20777; and the final specimen shall be prepared in the "to be tested" state.

6.2 Test environment

Unless otherwise specified, tensile strength and elongation at break (standard state) shall be tested under the standard conditions specified in GB/T 9278; other items shall be tested under the conditions specified in the relevant test method standards.

6.3 General requirements

Unless otherwise specified, only reagents confirmed to be chemically pure or higher and distilled or deionized water meeting the Class III water requirements of GB/T 6682 shall be used in the test. The test solution shall be pre-adjusted to the test temperature before the test.

6.4 Preparation of coating

Unless otherwise specified, preparation of coating shall be performed according to the provisions of GB/T 1727. After thoroughly mixing the specimen, apply 1~2 coats to a PTFE sheet (approximately 200 mm x 150 mm x (4 ~ 6) mm, or other suitable sizes) using a 100mm wire bar coater. When applying 2 coats, the interval between each coat shall not exceed 24 h.

Once the coating is smooth, use a steel or plastic coating mold (see Figure 1, consisting of multiple molds with a thickness of 0.3 mm or 0.5 mm) or an intermittent wet film preparation device (interval depth of 0.3 mm or 0.5 mm) to apply multiple coats; with the interval between each coat not exceeding 24 h. The final dry film thickness shall be (0.5 ± 0.1) mm. For specimens that are difficult to form a continuous film, the PTFE sheet can be sanded with P400 wet sandpaper to increase roughness before preparation of coating. The coating surface shall be smooth and free of defects such as bubbles and cracks. After the final film preparation, cure for 48 h under the standard conditions specified in GB/T 9278. After peeling off the film, place it face down in a constant temperature drying oven at (80 ± 2) °C, ensuring the distance between the test piece and the oven wall is no less than 50 mm. After 96 h, remove it and cure for 24 h under the standard conditions specified in GB/T 9278.

6.10 Freeze-thaw resistance

It shall be performed according to Method A in GB/T 9268-2008. The specimen quantity is

approximately 50 g. The specimen container is a cylindrical plastic or glass container with a volume of approximately 100 mL and a height of approximately 80 mm.

6.11 Storage stability

Place approximately 0.5 L of the specimen into a cylindrical plastic or glass container with a height of approximately 130 mm, leaving approximately 10% space inside. After sealing, place it in a constant temperature drying oven at $(50 \pm 2)^\circ\text{C}$. After 14 d, remove it and place it at $(23 \pm 2)^\circ\text{C}$ for 3 h. Open the container and observe for any stratification, skinning, hardening, or flocculation. The specimen can be spread into a uniform thin layer on a clean glass plate using a stirring rod, and then the presence of flocculent matter can be observed.

6.12 Dilution stability

The specimen was prepared into a homogeneous dilution with a non-volatile matter mass fraction of $(3 \pm 0.5)\%$. The dilution was poured into a 100 mL stoppered graduated cylinder to the 100 mL mark and stand at $(23 \pm 2)^\circ\text{C}$ for 72 h. The volumes of the supernatant and the sediment were then recorded. Dilution stability is expressed as the volume fraction of the supernatant and sediment in 100 mL of the dilution, and the results are rounded-off to the nearest integer.

6.13 Mechanical stability

At $10^\circ\text{C} \sim 30^\circ\text{C}$, the specimen was filtered through a $177\ \mu\text{m}$ pore size filter. $(400 \pm 0.5)\text{ g}$ of the filtered specimen was weighed into an approximately 1000 mL suitable container (approximately 10 cm in diameter). The container containing the specimen was fixed to the base of a high-speed disperser (with a disc-shaped stirring head, 40 mm diameter) using clamps.

The high-speed disperser was started; and the speed was gradually adjusted to 2500 r/min within 1 min. After dispersion for 0.5 h, the specimen was filtered through a $177\ \mu\text{m}$ pore size filter. Residue on the inner wall of the container was rinsed into the filter with tap water. The filter was then rinsed with tap water; and the presence of emulsion demulsification and obvious flocculent matter was observed.

6.14 Calcium ion stability

Add 30 mL of emulsion to a 50 mL beaker and stir with a stir bar. Simultaneously, slowly add 6 mL of 0.5% calcium chloride solution over 10 s. After thorough mixing, pour the solution into a 50 mL stoppered graduated cylinder. Incubate at $(23 \pm 2)^\circ\text{C}$ for 48 h and observe for any stratification, precipitation, or flocculation. Spread the specimen evenly onto a clean glass plate using a stir bar to form a thin, uniform layer and observe for any flocculation.