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Purificatory Performance of Coatings with Air Purification

室内空气净化功能涂覆材料净化性能

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Table of Contents

Foreword 3

1. Scope 4

2. Normative references 4

3. Terms and definitions 4

4. Classification and marking 5

5. Requirements 5

6. Test methods 5

7. Test report 8

8. Inspection rules 9

Foreword

This Standard was proposed by China Building Materials Federation.

This Standard shall be under the jurisdiction of National Technical Committee 195 on Constructional Materials and Decorative Materials of Standardization Administration of China (SAC/TC 195).

The main drafting organization of this Standard: China Building Materials Academy.

Participating drafting organizations of this Standard: Beijing Namei Technology Development Co., Ltd., Beijing Dajin Building Materials Co., Ltd, Ganzhou Qingsong Functional Materials Technology Co., Ltd., Shenzhen Haichuan Industrial Co., Ltd., Nippon Paint (China) Co., Ltd., ICI Swire Paints (China) Ltd., Shanghai Fuchen Chemical Industry Co., Ltd., Shanghai Hongkang Technology Development Co., Ltd., Shenzhen Fanghao Industrial Co., Ltd., Anyang Longyang Building & Decorative Materials Co., Ltd., Beijing Tianzhiyan Health Technology Co., Ltd, Huaxia Beineng (Beijing) Ecological Science & Technology Co., Ltd., Building Materials Industry Environment Monitoring Center, Beijing Building Science Research Institute AND Shanghai Building Science Research Institute (Group) Co., Ltd.

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This Standard is issued for the first time.

Purificatory Performance of Coatings with Air Purification

1. Scope

This Standard specifies the terms and definitions, product classification and marking, requirements, test methods, test report and inspection rules for coatings with air purification.

This Standard is applicable to indoor decorations, decorative coatings and painting materials with air purification. Decorative materials such as wall paper and ceilings with air purification can reference to this Standard.

2. Normative references

The following documents contain provisions which, through reference in this Standard, become provisions of this Standard. For dated references, their subsequent amendments (excluding corrections) or revisions do not apply to this Standard. However, the parties who enter into agreement based on this Standard are encouraged to investigate whether the latest versions of these documents are applicable. For undated reference documents, the latest versions apply to this Standard.

GB/T 3186 Sampling Paint Products

GB/T 16129 Standard Method for Hygienic Examination of Formaldehyde in Air of Residential Areas - Spectrophotometric Method

GB/T 18883 Indoor Air Quality Standard

3. Terms and definitions

The following terms and definitions apply to this Standard.

3.1 Air purification

The action of reducing pollutants in the air and making the air clean.

3.2 Air-purification coating

Coating that can reduce or remove one or more harmful organic substances in the air.

3.3 Purification efficiency

Within a specified time, the ratio OF, the concentration difference of a harmful substance

to the theoretical application amount; the test shall be conducted after natural drying for 24 hours under the test environment of 6.1.

6.5 Purification efficiency

6.5.1 Test steps

6.5.1.1 Put the prepared test sample plates and the blank glass plates into the sample chamber and the comparison chamber respectively, four plates on the sample shelf in each chamber, the side painted with sample facing the center of the chamber.

6.5.1.2 Put a glass plate on the bottom of the test chamber, close the test chamber; use micro-syringe to take (3±0.25)μL analytically pure formaldehyde or analytically pure toluene solution; drop it in the glass plate through the injection hole; then close the injection hole.

6.5.1.3 During test of photocatalysis materials, turn on the daylight lamps in the two test chambers. Collect the air inside the chamber after closing for 1 hour to test its concentration, which is the initial concentration (n_0). After 48 hours, collect the air inside the chamber and test its concentration, which is the final concentration (n_1). Turn on the fan for 30min before collecting the air and turn it off when sampling.

6.5.1.4 During test of non-photocatalysis materials, do not turn on the daylight lamps. Collect the air inside the chamber after closing for 1 hour to test its concentration, which is the initial concentration (n_0). After 24 hours, collect the air inside the chamber and test its concentration, which is the final concentration (n_1). Turn on the fan for 30min before collecting the air and turn it off when sampling.

6.5.2 AHMT Spectrophotometric Method specified in GB/T 16129 shall be adopted for testing and analysis of formaldehyde concentration.

6.5.3 The gas chromatographic method in Appendix B of GB/T 18883 shall be adopted for testing and analysis of toluene concentration.

6.5.4 Calculation of the results

6.5.4.1 Decision of pass condition: compare the natural decay of harmful substance with the initial concentration (n_0) and the final concentration (n_1) of the comparison chamber; if the natural decay rate of formaldehyde ≤30%, or the natural decay rate of toluene ≤25%, then the test is passed. The natural decay rate shall be calculated with formula (1) :

$$R = (n_0 - n_1) / n_0 \times 100\% \quad \ldots (1)$$

Where,

R – natural decay rate, %;

8. Inspection rules

8.1 This Standard's technical requirements are type inspection

8.1.1 Under normal production conditions, type inspection shall be conducted according to this Standard once a year.

8.1.2 Type inspection shall be conducted when:

a) When finalizing the type identification of a new product;

b) When manufacturing the product at a different site;

c) When there is significant change of production formula, process or raw material;

d) When the production is resumed after shutdown for three months.

8.2 Group-batch rules and sampling scheme

8.2.1 Group-batch: the products in a mixing shall be of a same batch number. The product with the same-raw material and same-formula shall be deemed as a same batch, not more than 10t for each batch. If the production within 7 days is less than 10t, the output in 7 days shall be deemed as one batch. A delivery can be in one or more batches.

8.2.2 Sampling: the samples shall be randomly taken from the products according to GB/T 3186. The samples are divided into two parts, one for sealing storage for future reference, and the other for inspection.

8.2.3 Decision of inspection results

When the inspection results meet the technical requirements of this Standard, then this batch shall be deemed as meeting the requirements of this Standard; if any item of the inspection results fails to meet the requirements of this Standard, then this batch shall be deemed as not meeting the requirements of this Standard.

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