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Nitrocellulose coatings

硝基涂料

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Foreword

This Standard was proposed by China Petroleum and Chemical Industry Federation.

This Standard shall be under the jurisdiction of National Standardization Technical Committees (SAC/TC 5).

The drafting organizations of this Standard: CNOOC Changzhou coating Chemical Research Institute, Shanghai Fu-chen Chemical Co., Ltd., Nanjing Yangtze River Paint Co., Ltd., Zhejiang GTC Paint Industry Group Co., Ltd., Foshan Maydos Chemical Co., Ltd., China Paint (Shenzhen) Co., Ltd., Jiangsu Elephant East Asia Paint Co., Ltd., Guangzhou Pearl River Chemical Industry Group Co., Ltd., Shenzhen Song Hui Chemical Co., Ltd., and Sichuan Dangerous Chemicals Quality Supervision and Inspection Institute.

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Nitrocellulose coatings

1 Scope

This Standard specifies the classification, requirements, test methods, inspection rules and marks, package and storage of nitrocellulose coatings.

This Standard is applicable to modified coatings which take nitrocellulose as main film forming materials and are added with alkyd resin, modified rosin, and acrylic resin. The products mainly apply to metal, plastic, wood and other surface protection and decoration.

This Standard is not applicable to protection and decoration of wood product surface for interior decoration use (including factory coating).

2 Normative references

The following standards contain the provisions which, through reference in this Standard, constitute the provisions of this Standard. For dated references, the 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 1722-1992 Color of varnishes, boiled oils and thinners

GB/T 1725-2007 Paints varnishes and plastics - Determination of non-volatile-matter content (ISO 3251:2003, IDT)

GB/T 1726-1979 Methods of test for hiding power of paints

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

GB/T 1735-2009 Paints and varnishes - Determination of heat resistance (ISO 3248:1998, Paints and varnishes - Determination of the effect of heat, MOD)

GB/T 1762-1980 Test for after-tack of paint films

GB/T 1766-2008 Paints and Varnishes - Rating Schemes of Degradation of

Coats

GB 1922-2006 Petroleum solvents for paints and cleaning

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

GB/T 6682 Water for analytical laboratory use - Specification and test methods (GB/T 6682-2008, ISO 3696:1987, MOD)

GB/T 6753.1-2007 Paints varnishes and printing inks - Determination of fineness of grind (ISO 1524:2000, IDT)

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

GB/T 9271-2008 Paints and varnishes standard panels for testing (ISO 1514:2004, MOD)

GB/T 9274-1988 Paints and varnishes - Determination of resistance to liquids (eqv ISO 2812:1974)

GB/T 9278 (GB/T 9278-2008, ISO 3270:1984, Paints and varnishes and their raw materials - Temperatures and humidities for conditioning and testing, IDT)

GB/T 9286-1998 Paints and varnishes; Determination of resistance to liquids (eqv ISO 2409:1992)

GB/T 9750 Marks for package of coating products

GB/T 9754-2007 Paints and varnishes - Determination of specular gloss of non-metallic paint films at 20° 60° and 85° (ISO 2813:1994, IDT)

GB/T 13452.2-2008 Paints and varnishes - Determination of film thickness (ISO 2808:2007, IDT)

GB/T 13491 General rule for packing of coatings

JB/T 7499-2006 Coated abrasives - Waterproof abrasive paper

3 Product classification

Nitrocellulose coating is classified into nitrocellulose primer and nitrocellulose finish paint. And nitrocellulose finish paint is classified into varnish and paint.

5.3.1 Substrate processing

Unless otherwise agreed, steel plates, tin plates and glass plates for test use shall comply with requirements in GB/T 9271-2008. Steel plate processing shall be conducted in accordance with the provisions in 3.5 of GB/T 9271-2008. Tin plate processing shall be conducted in accordance with the provisions in 4.3 of GB/T 9271-2008. Glass plate processing shall be conducted in accordance with the provisions in 7.2 of GB/T 9271-2008. Substrate material type and substrate processing method agreed shall be indicated in the inspection report.

5.3.2 Preparation of test sample

Unless otherwise agreed, sample preparation shall be based on Table 3 and determination of sample coating thickness shall be conducted according to the provisions in GB/T 13452.2. When it uses different method for coating preparation from the one stipulated in this Standard, it shall be indicated in the inspection report.

Table 3 Preparation of test sample

Inspection item	Substrate type	Substrate size mm	Coating requirements
Constructability Coating appearance	Tin plate	200×100×(0.2~0.3)	One layer of primer: (23±3) μm Two layers of varnish: (30±5) μm (time interval of each layer: 30 min) Two layers of paint: (35±5) μm (time interval of each layer: 30 min) Conduct the test for coating appearance after placing it for 48 h.
Adaptability to finish paint	Steel plate or agreed one	200×100×(0.2~0.3)	One layer of primer: (23±3) μm; the thickness of supporting finish paint shall be agreed; conduct the test after placing it for 48 h.
Drying time	Tin plate	120×50×(0.2~0.3)	One layer of primer: (23±3) μm
			One layer of varnish: (15±3) μm
			One layer of paint: (23±3) μm

Table 3 (continued)

Inspection item	Substrate type	Substrate size mm	Coating requirements
Cross cut test	Steel plate	120×50×(0.45~0.55)	One layer of primer: (23±3) μm; conduct the test after placing it for 24 h.

adaptability to finish paint, it shall evaluate whether the finish paint is accessibly applied on the primer at first. Then applying the finish paint for 48 h. Visually observe it under natural sunlight, if there are no peeling, cracking, wrinkling, shrinkage, spots or uneven gloss, it shall be evaluated as “no adverse effect on finish paint”.

5.14 Grinability

Bake it for 1 h at $(60\pm 2)^{\circ}\text{C}$. Use P400 (No.400) water sandpaper which complies with the provisions of JB/T 7499-2006 to grind for 30 times. If the coating is easy to be grinded as smooth surface, it shall be evaluated as “easy to grind”.

5.15 Gloss

Conduct according to the provisions of GB/T 9754-2007.

5.16 After tack

5.16.1 Dry the varnish sample for 1 h under stipulated conditions. Put it into a $(80\pm 2)^{\circ}\text{C}$ oven and heat it for 30 min. Take the sample out. Place it for 1 h under stipulated conditions. Conduct according to the provisions of GB/T 1762-1980.

5.16.2 Conduct according to the provisions of GB/T 1762-1980 for paint sample.

5.17 Color bleeding

Spray white nitrocellulose coating of same category on the dried paint coating. Place it for 30 min under stipulated conditions. Visually observe it under natural sunlight, if the product for test has not bled into the white coating and caused color change, it shall be evaluated as “no color bleeding”.

5.18 Heat resistance

Conduct the determination of heat resistance according to the provisions of GB/T 1735-2009. Heat the varnish sample in a $(115\sim 120)^{\circ}\text{C}$ oven for 2 h. Heat the paint sample in a $(100\sim 105)^{\circ}\text{C}$ oven for 2 h. Take it out and place it for 1 h under stipulated conditions before observe it.

5.19 Water resistance

5.19.1 Dry the varnish sample for 1 h under stipulated conditions. Heat it in a $(80\pm 2)^{\circ}\text{C}$ oven for 30 min. Take the sample out. Then place it for another 1 h under stipulated conditions. Conduct it according to the immersion method of GB/T 9274-1988. Immerse it into the grade three water that complies with GB/T 6682 for 18 h, and take it out. Make it recover for 2 h and examine the coating. If there are no wrinkles, blistering, cracking, spalling, obvious discoloration,

clear gloss coating changes or other pathological phenomena to at least 2 samples out of 3, it shall be evaluated as “no abnormality”.

5.19.2 For paint sample, conduct it according to the immersion method of GB/T 9274-1988. If there are no wrinkles, blistering, cracking, spalling, obvious discoloration, clear gloss coating changes or other pathological phenomena to at least 2 samples out of 3, but slight whitening, loss of gloss, blistering and recovery within 2 h are allowable, it shall be evaluated as “no abnormality”.

If there are pathological phenomena motioned above, conduct it according to the provisions of GB/T 1766-2008.

5.20 Volatile oil resistance

Dry the sample for 1 h under stipulated conditions. Place it in a $(80\pm 2)^{\circ}\text{C}$ oven and heat it for 30 min. Then place it for 1 h under stipulated conditions as test sample. Conduct it according to the immersion method of GB/T 9274-1988. Immerse it in No.3 ordinary paint and cleaning solvent oil that comply with the provisions of GB 1922-2006 for 2 h. If there are no wrinkles, blistering, cracking, spalling, obvious discoloration, clear gloss coating changes and other pathological phenomena to 2 samples out of 3, and liquid's turbidity is not great, it shall be evaluated as “no abnormality”.

If there are pathological phenomena motioned above, conduct it according to the provisions of GB/T 1766-2008.

6 Inspection rules

6.1 Inspection classification

6.1.1 Product inspection consists of exit-factory inspection and type inspection.

6.1.2 Exit-factory inspection items include state in container, non-volatile content, original paint color, degree of fineness, hiding power, constructability, drying time, coating appearance, gloss, cross cut test and grinability.

6.1.3 Type inspection items include all technical requirements listed in this Standard. In normal production, conduct the inspection at least once each year for after tack, color bleeding, water resistance, heat resistance, volatile oil resistance and adaptability to finish paint.

6.2 Determination of inspection results

6.2.1 Determination of inspection results shall be conducted according to rounding value comparison method in GB/T 8170.

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