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

GB 30982-2014

Limit of hazardous substances in construction adhesive

建筑胶粘剂有害物质限量

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1 Scope

GB 30982-2014 is the Chinese national standard on limit of hazardous substances in construction adhesive, in the field of rubber and plastic industries. It carries no /T suffix, which in the Chinese system means compliance is mandatory: a product or a practice within its scope has to meet it to be lawfully made, sold or carried out in China. It was issued on 24 July 2014 by the General Administration of Quality Supervision, Inspection and Quarantine of the People's Republic of China; Standardization Administration of China, and has been in force since 1 May 2015. Classification: ICS 83.180, CCS G38. This page is published from the official record of the standard held by the Chinese standards administration: the identification, the dates, the classification and the issuing body are taken from there. The clause text, the tables and the numeric limits are in the document itself, which is delivered complete in English translation.

This Standard specifies terms and definitions, requirements for the allowable limits of hazardous substances to the human body and the environment, test methods, inspection rules, packaging marks of construction adhesive. This Standard is applicable to construction adhesive for bonding or sealing. This Standard is applicable to solvent-based construction adhesive, water- based construction adhesive and bulk construction adhesive.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

GB/T 601-2002, Chemical Reagent - Preparations of Standard Volumetric Solutions

GB/T 2943, Terms of adhesive

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

GB 18583-2008, Indoor decorating and refurbishing materials - Limit of harmful substances of adhesives

3 Terms and definitions

For the purposes of this document, the terms and definitions defined in GB/T 2943 as well as the followings apply.

3.1 construction adhesive adhesive that is used in the construction industry and related fields to bond adherends together through adhesion

3.2 solvent-based construction adhesive

5.2 Benzene, toluene, xylene The determination of benzene, toluene and xylene content shall be carried out in accordance with the provisions of Annex B.

5.3 Halogenated hydrocarbon The determination of halogenated hydrocarbon content is carried out in accordance with the provisions of Annex C.

5.4 Toluene diisocyanate The determination of toluene diisocyanate content is carried out in accordance with the provisions of Annex D.

5.5 Phthalate compound The determination of the content of phthalate compound shall be carried out in accordance with the provisions of Annex E. The type and content of phthalate compound can also be confirmed and calculated according to the actual production formula.

5.6 Total volatile organic compound The total volatile organic compound content is determined in accordance with the provisions of Annex F of GB 18583-2008.

6 Inspection rules

6.1 Type inspection All technical requirements listed in this standard are type inspection items. Under normal production conditions, type inspection shall be carried out at least once a year. Type inspection shall be carried out when the production formula, process and raw materials have major changes or when production resumes after 3 months of suspension.

6.2 Sampling method Randomly take 3 samples from the same batch of products. Each sample is not less than 0.5kg.

6.3 Determination of inspection result Among the 3 samples taken, take 1 sample for

determination according to the provisions of this Standard. If the inspection results of all items meet the

Annex A

(normative) Determination of free formaldehyde content in water-based construction adhesive

A.1 Acetylacetone spectrophotometry

A.1.1 Overview

This method specifies the determination of free formaldehyde content in water-based construction adhesive. This method is suitable for water-based construction adhesive with free formaldehyde content greater than 0.05g/kg.

A.1.2 Principle

Use water to dissolve the water-based construction adhesive. Distill free formaldehyde dissolved in water with water. In acetic acid-ammonium acetate buffer solution with pH=6, formaldehyde interacts with acetylacetone in distillate. Quickly generate stable yellow compounds under boiling water bath conditions. Measure the absorbance at 415nm after cooling. According to the standard curve, calculate the free formaldehyde content in the sample.

A.1.3 Reagents

Unless otherwise specified, in the analysis, only the confirmed analytically-pure reagents and distilled water or deionized water or equivalent purity water are used.

A.1.3.1 Ammonium acetate.

A.1.3.2 Glacial acetic acid: $\rho=1.055\text{g/mL}$.

A.1.3.3 Acetylacetone: $\rho=0.975\text{g/mL}$.

Acetylacetone solution: 0.25% (volume fraction). Weigh 25g of ammonium acetate (A.1.3.1). Add a small amount of water to dissolve. Add 3mL of glacial acetic acid (A.1.3.2) and 0.25mL of acetylacetone (A.1.3.3). After mixing, add water to 100mL. Adjust pH=6.0. This solution is stored at 2°C~5°C and can be stable for one month.

A.1.3.4 Hydrochloric acid solution: 1+5(V+V).

A.1.3.5 Sodium hydroxide solution: 30g/100mL.

based construction adhesive. This method is suitable for water-based construction adhesive with free formaldehyde content greater than 0.01g/kg.

A.2.2 Principle

Use water to dilute and extract free formaldehyde in the sample. After derivatization with 2,4-dinitrophenylhydrazine to form formaldehyde hydrazine, use high performance liquid chromatograph to determine. Use external standard method to quantitatively determine.

A.2.3 Reagents and standard solutions

Except for special requirements, all reagents used are analytically-pure. The water shall meet the requirements of grade one water in GB/T 6682-2008.

A.2.3.1 Reagents

A.2.3.1.1 Acetonitrile (chromatographically pure).

A.2.3.1.2 Phosphoric acid (chromatographically pure, mass fraction is 85%).

A.2.3.1.3 2,4-Dinitrophenylhydrazine (purity is greater than 97%).

A.2.3.1.4 Derivatization reagent:

Weigh 0.1g of 2,4-dinitrophenylhydrazine (A.2.3.1.3) into a 1000mL brown volumetric flask. Add 6mL of phosphoric acid (A.2.3.1.2), acetonitrile (A.2.3.1.1) to set volume.

A.2.3.1.5 Formaldehyde-2,4-dinitrophenylhydrazone (standard product, concentration is 1.0mg/mL, molecular formula: $\text{C}_7\text{H}_6\text{N}_4\text{O}_4$, relative molecular weight: 210.15).

A.2.3.2 Standard solution

Use a pipette to accurately pipette 0.5mL of 1.0mg/mL formaldehyde-2,4-dinitrophenylhydrazone (A.2.3.1.5) into a 50mL volumetric flask. Use acetonitrile (A.2.3.1.1) to set volume. Set it as the first level standard solution. Take 20.00mL of the first level standard solution and add it to a 50mL volumetric flask. Use acetonitrile (A.2.3.1.1) to set volume. Set it as the second level standard solution. Take

20.00mL of the second level standard solution and add it to a 50mL volumetric flask. Use acetonitrile (A.2.3.1.1) to set volume. Set it as the third level standard solution. Take 20.00mL of the third level standard solution and add it to a 50mL volumetric flask. Use acetonitrile (A.2.3.1.1) to set volume. Set it as the fourth

Annex B

(normative) Determination of benzene, toluene and xylene content B.1 Principle The adhesive sample is diluted and injected directly into the gas chromatograph. After separation by chromatographic column, use hydrogen flame ionization detector to detect. Use internal standard method to quantitatively determine. B.2 Reagents and materials B.2.1 Carrier gas: Nitrogen, purity $\geq 99.995\%$. B.2.2 Fuel gas: Hydrogen, purity $\geq 99.995\%$. B.2.3 Combustion gas: Air. B.2.4 Auxiliary gas (septum purge and makeup gas): Nitrogen with the same properties as the carrier gas. B.2.5 Internal standard substance: The compound is not present in the sample, and this compound can be completely separated from other components on the chromatogram. The purity is at least 99% (mass fraction) or the purity is known. For example: n-undecane, n-tetradecane. B.2.6 Calibration compound: Benzene, toluene, xylene, with a purity of at least 99% (mass fraction) or the purity is known. B.2.7 Dilution solvent: Organic solvent used to dilute the sample. It does not contain any substances that interfere with the test. The purity is at least 99% (mass fraction) or the purity is known. For example: ethyl acetate. B.3 Instruments and equipment B.3.1 Gas chromatograph. The configuration is as follows:

- a) Injection port of splitter device, and the lining of the vaporization chamber can be replaced;
- b) Program temperature controller;
- c) Detector: Flame ionization detector (FID);
- d) Chromatographic column: It shall be able to separate the tested substance shown in B.2.6 into the chromatograph. Record the retention time of each test compound. B.5.2.3 Qualitative analysis Weigh 0.2g of product sample. Use appropriate amount of diluent (B.2.7) to dilute the sample. Use the sample injector (B.3.2) to take 1.0 μ L of the mixed sample and inject it into the chromatograph. Record the chromatogram. Compare it with the retention time of the standard test compound determined by B.5.2.2 to determine whether there is a tested compound. B.5.3 Calibration B.5.3.1 Preparation of calibration sample: Weigh a certain amount (to the nearest of 0.1mg) of various calibration compounds in B.2.6 into the sample bottle (B.3.3). The weighed mass and the content of various compounds contained in the sample to be tested shall be in the same order of magnitude. Then weigh the internal standard substance (B.2.5) of the same order of magnitude as the compound to be tested into the same sample preparation bottle. Use an appropriate amount of diluent solvent (B.2.7) to dilute the mixture. Seal the sample preparation bottle and shake it well. B.5.3.2 Test of relative correction factor: Under the same chromatographic test conditions