

ICS 83.180
CCS G39



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

GB 33372-2020

Replacing GB/T 33372-2016

Limit of volatile organic compounds content in adhesive

胶粘剂挥发性有机化合物限量

Issued on: March 4, 2020

Implemented on: December 1, 2020

**Issued by: State Administration for Market Regulation;
Standardization Administration of China**

Table of Contents

1	Scope
2	Normative references
3	Terms and definitions
4	Classification
5	Limit of VOC content
5.1	Basic requirements
6	Test method
6.2	Determination of VOC content
7	Inspection rules
7.1	Inspection items
8	Labels for packages
	Appendix A
	Appendix B
	Appendix C

1 Scope

GB 33372-2020 is the Chinese national standard on limit of volatile organic compounds content in 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 4 March 2020 by the State Administration for Market Regulation; Standardization Administration of China, and has been in force since 1 December 2020. Classification: ICS 83.180, CCS G39. 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 the limit requirements, test methods, inspection rules and packaging marks of volatile organic compounds (hereinafter referred to as VOC) content in adhesive under specified conditions. This Standard applies to the limitation of volatile organic compounds content in solvent-based, water-based and bulk adhesives. This Standard does not apply to. -- adhesives that are used as intermediates or as raw materials for production without entering the circulation field; -- adhesives for testing or evaluation in any research and development, quality assurance or analytical laboratory; -- urea

formaldehyde, phenolic formaldehyde, melamine formaldehyde adhesives; -- special functional surface treatment agent that is applied when materials are bonded.

2 Normative references

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

GB/T 2793, The method for determination of nonvolatile content of adhesives

GB/T 2943, Terms of adhesive

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

GB/T 13354, Test method for density of adhesives in fluid form - Method of weight cup

GB 19340, Adhesives for footwear and case and bag

GB/T 20740, Adhesive - Sampling

GB 30982, Limit of hazardous substances in construction adhesive

GB 37822, Standard for fugitive emission of volatile organic compounds

HG/T 2492-2018, Ethyl alpha-cyanoacrylate instantaneous adhesives

3 Terms and definitions

Terms and definitions determined by GB/T 2943, GB 37822 and the following ones are applicable to this document.

3.1 Volatile organic compounds content VOC content The measured mass of the volatile organic compounds per unit volume or mass of the adhesive under the specified conditions.

3.2 Solvent-based adhesive Adhesive that uses volatile organic solvent as the main dispersion medium.

3.3 Water-based adhesive Adhesive that uses water as the main dispersion medium.

3.4 Bulk adhesive Adhesive whose dispersion medium content is less than 5% of the total.

4 Classification

According to different dispersion media and contents in adhesive products, it is divided into three types. solvent-based, water-based, and bulk.

Note. in general, water-based adhesive and bulk adhesive are low-VOC adhesives.

5.1 Basic requirements

5.1.1 The content of single volatile organic compounds, such as benzene series (benzene, toluene and xylene), halogenated hydrocarbons (dichloromethane, 1,2-dichloroethane, 1,1,1-trichloroethane, 1,1,2-trichloroethane), toluene diisocyanate, free formaldehyde, in adhesive products shall meet the requirements of GB 30982 or GB 19340.

5.1.2 For adhesive products which are expressly used for a variety of purposes, take the lowest limit of each requirement.

5.2 Limit of VOC content in solvent-based adhesive The limit of the VOC content in solvent-based adhesive shall meet the requirements of Table 1.

6 Test method

6.1 Sampling Adhesive product sampling shall be carried out in accordance with GB/T 20740.

6.2 Determination of VOC content

6.2.1 The determination of VOC content in solvent-based adhesive shall be performed according to Appendix A.

6.2.2 The VOC content in water-based adhesive shall be determined in accordance with the provisions of Appendix D.

6.2.3 The VOC content in bulk adhesive shall be determined in accordance with the provisions of Appendix E.

7.1 Inspection items

7.1.1 All requirements that are listed in this Standard are type inspection items.

7.1.2 Under normal production conditions, type inspection shall be carried out at least once a year.

7.1.3 Type inspection shall be carried out in any of the following cases. -- when a new product is initially finalized; -- when the product is produced off-site; -- when there are major changes in production formulas, processes, and key raw material sources; -- when production is resumed after 3 months of suspension.

7.2 Product sampling Randomly select three samples from the same batch of products, each of which is not less than

0.5 kg.

8 Labels for packages

Adhesive products that pass the inspection according to this Standard shall be clearly indicated that the product meets this Standard on the packaging or the product documentation.

Appendix A

(Normative) Determination of VOC content in solvent-based adhesive

A.1 Overview Place an appropriate amount of the adhesive in a blast drying oven at a constant temperature; measure the amount of the volatiles in the adhesive within a prescribed time. Use the gas chromatography to determine the content of low photochemical reaction compounds; use Karl Fischer method or gas chromatography to determine the water content in the adhesive; subtract the water content and the acetone, methyl acetate and dimethyl carbonate amount from the amount of the volatiles in the adhesive, to obtain the VOC content in the adhesive.

A.2 Test steps

A.2.1 General Perform two parallel determinations for all tests.

A.2.2 Density Prepare the mixed sample according to the matching requirements that are expressed by the adhesive product; after stirring well, measure the density of the sample according to the method that is specified in GB/T 13354, at a test temperature of $(23 \pm 2) ^\circ\text{C}$.

A.2.3 Volatile content of the sample

A.2.3.1 One-component sample Determine the non-volatile content of the sample according to the method that is specified in GB/T 2793.

A.2.3.2 Multi-component sample According to the matching requirements that is expressed by the adhesive product, take about 2 g of the mixed sample; stir it well quickly; then, measure the non-volatile content of the sample within 5 minutes according to the method that is specified in GB/T 2793.

A.2.3.3 Volatile content of the sample Calculate the volatile content of the sample according to Formula (A.1). Where.

A.2.4 Water content Perform the determination in accordance with Appendix B.

A.2.5 Acetone, methyl acetate and dimethyl carbonate content Perform the determination in accordance with Appendix C.

A.2.6 VOC content Perform the calculation of VOC content in solvent-based adhesive according to Formula (A.2).

Appendix B

(Normative) Determination of water content in adhesive

B.1 Overview For the water content in the adhesive, use the gas chromatography or the Karl Fischer method to determine; the gas chromatography is the arbitration method.

B.2 Gas chromatography

B.2.1 Reagents and materials

B.2.1.1 Distilled water. in accordance with the requirements of grade-3 water in GB/T 6682.

B.2.1.2 Dilution solvent. anhydrous N, N-dimethylformamide (DMF), analytical reagent.

B.2.1.3 Internal standard. anhydrous isopropanol, analytical reagent.

B.2.1.4 Carrier gas. hydrogen, helium or nitrogen, the purity is not less than 99.995%.

B.2.2 Apparatus

B.2.2.1 Gas chromatograph. equipped with a thermal conductivity detector and a programmed heating controller.

B.2.2.2 Chromatographic column. a stainless-steel column