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Custom furniture - Field test method of volatile organic compounds

定制家具 挥发性有机化合物 现场检测方法

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Custom furniture - Field test method of volatile organic compounds

1 Scope

This Standard specifies the principle, test conditions, equipment, samples, test procedures, data processing for field test method of volatile organic compounds in custom furniture.

This Standard is applicable to determination of the release rate of volatile organic compounds in custom furniture based on boards.

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 31106-2014, *Determination of volatile organic compounds in furniture*

GB/T 32443-2015, *Determination of the emission of volatile organic compounds from furniture - Emission test cell method*

3 Terms and definitions

For the purposes of this document, the terms and definitions defined in GB/T 31106-2014 as well as the followings apply.

3.1 volatile organic compounds; VOC

An organic compound with a boiling point not exceeding 260°C released from the sample.

3.2 total volatile organic compounds; TVOC

Volatile organic compounds that use Tenax GC or Tenax TA sampling, non-polar chromatographic column (polarity index less than 10) for analysis; the retention time is between n-hexane and n-hexadecane.

7 Samples

For hard cladding flat parts, the main furniture materials and facing materials used are the same. As a class of specimen, when the thickness of the plate is different, choose the one with the largest proportion as the specimen. When necessary, the parts of different thicknesses are used as a class of specimens.

For soft cladding and non-planar parts (such as push-pull components, top seal panels), the main furniture materials and facing materials used are the same, and the structure is similar, as a class of specimens.

For the parts with holes, slots and unsealed edges in panel furniture, when its surface area exceeds 5% of the total surface area of the part, disassemble the part as a class of specimens.

Before starting the test, the surface area of the specimen shall be measured to the nearest 0.01m^2.

NOTE: Furniture hardware and unpainted glass and stone parts shall not be selected as specimens.

8 Test steps

8.1 Sample collection

8.1.1 Small diffuser cover method

8.1.1.1 Specimens with flat surfaces of hard parts can be tested by this method.

8.1.1.2 Place the specimen horizontally. The testing surface faces up. Place a small diffuser cover on the specimen. Seal it. When applicable, the inner surface of the small diffuser cover shall cover at least one hardware installation hole or/and groove.

8.1.1.3 According to the method specified in GB/T 32443-2015, carry out the collection of the emission of volatile organic compounds. The total flow of equipment inlet gas shall be controlled at 300mL/min~900mL/min. Start sampling after 1h ventilation. Sampling is carried out according to the method specified in GB/T 31106-2014. The sampling flow rate may be different from the provisions of GB/T 31106-2014. The sampling flow rate shall not be greater than 80% of the equipment outlet gas flow rate.

8.1.2 Air bag method

8.1.2.1 Put the specimen into the air bag at a load rate close to 1m^2/m^3. Use a

smooth metal support that does not contain volatile organic compounds to prop up the specimen to ensure uniform gas in the bag. Seal it with a sealing strip. Vacuum the bag with a micro vacuum pump. Observe air tightness.

8.1.2.2 Adjust the high-purity nitrogen gas supply system. Adjust the relative humidity of the intake air to (45±5)%. If the air bag does not leak, fill the air bag with 50% of the volume of nitrogen. Vacuum the bag again. Fill it with high-purity nitrogen. Vacuum the bag again. Repeat this operation three times.

8.1.2.3 Then fill with high-purity nitrogen to make the sample loading rate close to $1m^2/m^3$. Record the amount of inflation, accurate to 1L. The inflation shall be completed within 15 minutes.

8.1.2.4 Close the gas valve. Keep the air bag sealed. Gently shake the air bag once every 15 minutes or so. Shake for about 15s each time to fully mix the gas in the bag.

8.1.2.5 Sampling and determination are performed separately at 0h, 1h, and 2h after the air bag is sealed. The total sample volume cannot exceed 10% of the inflation volume. The formaldehyde sampling flow rate shall be 500mL/min. Collect 10L of gas. The sampling flow of benzene series and TVOC shall be 200mL/min. Collect 1L.

8.2 Analysis and determination

Formaldehyde, benzene series and TVOC are analyzed and determined according to the method specified in GB/T 31106-2014. It can also be directly measured by on-site testing equipment. In the event of a dispute, the measurement result of GB/T 31106-2014 shall prevail.

For off-site analysis and testing, put the gas samples collected on site into stainless steel or glass containers that are free of volatile organic compound pollution. Bring it back to the laboratory for analysis in time. The formaldehyde organic compounds collected by the large bubble absorption tube shall be analyzed and determined within 24 hours at room temperature. The benzene series and TVOC collected by the Tenax GC or Tenax TA adsorbent sampling tube shall be analyzed and determined within 14 days.

9 Data processing

9.1 Release rate of volatile organic compounds in the small diffuser cover method

The volatile organic compound release rate of the sample is calculated according to formula (1). The (n/L) in the formula can be converted by the

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