



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

GB/T 33610.1-2019

**Textiles -- Determination of deodorant property -- Part 1:
General principle**

Issued on: December 31, 2019

Implemented on: July 1, 2020

Issued by: SAMR; SAC

Table of Contents

Foreword	3
Introduction	5
1 Scope	6
2 Normative references	6
3 Terms and definitions	6
4 Principle	8
5 Reagents	8
6 Materials and equipment	9
7 Test environment and sample conditioning	10
8 Test procedures	10
9 Result calculation	10
10 Determination of deodorant properties of textile products	11
11 Test report	11
Appendix A (Informative) Deodorant substances	12
Appendix B (Informative) Human sensory testing	15
Appendix C (Informative) Deodorant textile certification (Example)	17
Appendix D (Informative) Unpleasant odour chemical component and deodorization mechanism	19
Appendix E (Informative) Determination of test conditions for instrumental test methods	21

1 Scope

This part of GB/T 33610 specifies the general principles for the determination of the deodorant properties of textiles.

This part applies to textile products such as woven fabrics, knitted fabrics, non-woven fabrics, fibers and yarns, braids, strips and ropes.

2 Normative references

The following documents are essential for the application of this document. For referenced documents with dates, only the versions corresponding to the dates are applicable to this document; for referenced documents without dates, the latest versions (including all amendments) are applicable to this document.

GB/T 6529 Textiles - Standard atmospheres for conditioning and testing (GB/T 6529-2008, ISO 139:2005, MOD)

GB/T 33610.2 Textiles - Determination of deodorant property - Part 2: Detector tube method (GB/T 33610.2-2017, ISO 17299-2:2014, MOD)

GB/T 33610.3 Textiles - Determination of deodorant property - Part 3: Gas chromatography method (GB/T 33610.3-2019, ISO 17299-3:2014, MOD)

3 Terms and definitions

The following terms and definitions apply to this document.

3.1.1 unpleasant odour

Unpleasant smells related to people's living environment, such as toilet smell, sweat smell, body odour (2-Nonenal mixture odour) and excrement smell.

3.1.2 major component chemicals of unpleasant odour

The main chemical components of odours in people's living environment.

NOTE 1: These chemical components include:

- Toilet odour: ammonia;
- Sweat odour: ammonia, acetic acid and isovaleric acid;
- Body odour (2-nonenal mixture odour): ammonia, acetic acid, isovaleric acid and 2-nonenal;
- Excrement odour: ammonia, acetic acid, hydrogen sulfide, methyl mercaptan and indole.

NOTE 2: There may be other related chemical substances, but those listed are representative.

3.1.3 deodorant property

Ability to reduce unpleasant odours in surrounding air.

NOTE: The unpleasant odour is caused by the chemical components listed in 3.1.2.

3.1.4 deodorant textiles

Textiles with deodorant properties.

NOTE: The unpleasant odour is caused by the chemical components listed in 3.1.2.

3.1.5 deodorant substances

Substances that can react physically or chemically with unpleasant odours and reduce them.

NOTE 1: The unpleasant odours are caused by the chemical components listed in 3.1.2.

NOTE 2: Appendix A gives examples of deodorant substances.

3.1.6 deodorant processing

The process of applying deodorant substances to the surface or inside of textile products to give them deodorant properties, including padding and drying processes, addition during chemical finishing, mixing into polymers during spinning, or other techniques.

3.2.1 evaluation of a deodorant property

The determination of the reduction rate of the concentration of unpleasant odour chemical components in the container containing the sample, compared with the test without the sample.

NOTE: The test method for the concentration of unpleasant odour chemical components is defined in

5.3 Methyl mercaptan (CH_3SH): Standard test gas diluted with nitrogen to a concentration (volume fraction) of 100 $\mu\text{L/L}$ or 1000 $\mu\text{L/L}$.

5.4 Hydrogen sulfide (H_2S): Standard test gas diluted with nitrogen to a concentration (volume fraction) of 100 $\mu\text{L/L}$.

5.5 Indole ($\text{C}_8\text{H}_7\text{N}$): Reagent.

5.6 Isovaleric acid [$(\text{CH}_3)_2\text{CHCH}_2\text{COOH}$]: The purity is 98.0%.

5.7 2-Nonenal ($\text{C}_9\text{H}_{16}\text{O}$): The purity is 95.0%.

5.8 Dilution gas: Dry air obtained by mixing nitrogen with a purity of 99.99% or above and oxygen, or nitrogen with a purity of 99.99% or above.

5.9 Ethanol: The purity is 99.5%.

6 Materials and equipment

6.1 Sampling bags: Sampling bags with a capacity of 1 L, 5 L, or 50 L can be used as required. The materials can be polyvinyl fluoride film, polyester and polyester composite film, polyvinyl alcohol film, etc. The sampling bag needs to be installed with a plastic or rubber tube before the test.

6.2 Air pump: It shall be equipped with a flow meter that can measure 0.2 L/min and

5 L/min gas. If a flow meter is not equipped, a cumulative flow meter shall be used.

6.3 Cumulative flow meter: It is capable of measuring gas flow rates of 500 mL/min and above.

6.4 Hand dryer: with an electric power of 1 kW; it is used to heat ammonia water to 40 degrees C~50 degrees C and volatilize it in a 1 L plastic bag. It can be replaced by equipment with the same function.

6.5 Syringes: Glass syringes with capacities of 0.5 mL and 100 mL.

6.6 Heat sealing device: It is used to seal the opening of the sampling bag. It can be replaced by a seal with the same sealing ability.

6.7 Aspirator: It shall be capable of evacuating all the gas in the sealed 5 L sampling bag. A vacuum pump can be used.

6.8 Sealing strip.

6.9 Oven: The temperature can reach 80 degrees C.

6.10 Gas cylinders: Standard test gas-generating devices may also be used.

7 Test environment and sample conditioning The test shall be carried out in a standard atmosphere with a temperature of (20.0 ± 2.0) degrees C and a relative humidity of $(65.0 \pm 4.0)\%$ as specified in GB/T6529. The sample shall be conditioned in this environment for at least 24 hours.

NOTE: This experiment can adopt the environment of temperature (23.0 ± 2.0) degrees C and relative humidity $(50.0 \pm 4.0)\%$ specified in GB/T6529. If adopted, please indicate it in the test report.

8 Test procedures The test procedures are specified in the following standards:

-- GB/T 33610.2: Detector tube method;

-- GB/T 33610.3: Gas chromatography method.

In the above methods, the concentration of the unpleasant odour chemical component when the sample is present is recorded as A, and the concentration of the unpleasant odour chemical component when the sample is not present is recorded as B.

9 Result calculation The reduction rate of the unpleasant odour chemical component concentration is calculated according to formula (1):

where:

ORR -- unpleasant odour chemical component concentration reduction rate, %;

B -- the average value of the concentration of unpleasant odour chemical components when no sample is present;

A -- the average value of the concentration of unpleasant odour chemical components