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

GB/T 23263-2024

Replacing GB/T 23263-2009

Determination of asbestos in products

制品中石棉含量测定方法

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1 Scope

China's national method for determining asbestos in products. It specifies the methods for identifying and quantifying asbestos in manufactured products, covering the sampling, the preparation, the analytical techniques and the reporting. Asbestos analysis is a regulatory determination with an unusual property: the answer is very often about presence rather than quantity, and a false negative has consequences that appear thirty years later. That shapes the method. Asbestos is not a chemical but a habit - six silicate minerals that happen to crystallise as fibres, chrysotile among the serpentines and five amphiboles - and each has a chemical twin that is not asbestos and is not regulated. Chrysotile and non-asbestiform serpentine have the same composition; tremolite asbestos and tremolite

are the same mineral. So a chemical analysis alone cannot answer the question: the identification has to establish the mineral and its morphology together, which is why polarised light microscopy with dispersion staining is the primary technique and why electron microscopy with electron diffraction and X-ray analysis is needed where the fibres are too fine to resolve optically. The other difficulty is the matrix. Asbestos was used in cement, in friction materials, in gaskets, in textiles, in coatings and in vinyl tile, and each has to be broken down to release the fibres without destroying them - ashing, acid dissolution or solvent extraction, chosen for the matrix and applied so as not to alter the mineral. The standard covers the sampling that makes a result representative of a product rather than of one piece, those preparation routes, the microscopy and the counting or estimation of content, and the reporting including the limit of detection. Issued on 28 November 2024 and in force since 1 June 2025, it replaces GB/T 23263-2009.

This document specifies the method overview and principles, reagents and materials, instruments and equipment, sample collection and preparation, qualitative and quantitative methods, test result reporting for the determination of asbestos content in products. This document applies to the determination of asbestos content in building materials, friction materials, sealing materials, thermal insulation materials, other non-metallic minerals.

2 Normative references

The contents of the following documents, through normative references, constitute essential provisions of this document. For dated references, only the version corresponding to that date applies to this document. For undated references, the latest version (including all amendments) applies to this document.

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

3 Terms and definitions

The following terms and definitions apply to this document.

3.1 Asbestos Among the minerals that constitute rocks, fibrous silicate minerals belonging to the serpentine group (chrysotile) and fibrous silicate minerals belonging to the amphibole group (amosite, crocidolite, tremolite, actinolite, anthophyllite).

3.2 Vermiculite Immersion liquid The liquid used to immerse the sample in microscopic qualitative analysis.

3.10 Vermiculite standard sample This sample, made from vermiculite and used for the analysis of vermiculite spray materials, making the pure vermiculite contain 0.5% tremolite and 0.8% chrysotile.

3.11 Residual ratio The ratio -- of the amount of the secondary analytical sample (residue) for quantitative determination, which is obtained after a series of treatments on the primary

analytical sample, such as with formic acid, TO the amount of the primary analytical sample.

3.12 Weight loss ratio The ratio -- of the amount of the primary analytical sample after heat treatment TO the total sample.

3.13 Integral intensity The area integral value of a specified X-ray diffraction peak.

4 Symbols and abbreviations

The following symbols and abbreviations apply to this document (see Table 1).

5.1.1 Qualitative method overview

5.1.1.1 The presence of asbestos in the product is determined by qualitative analysis using X-ray diffraction and polarizing microscopy.

5.1.1.2 The presence of asbestos in the vermiculite spray material is determined by

Note. When performing quantitative analysis using an X-ray diffractometer, internal standard methods and standard addition methods can be used. Although these methods are less accurate for asbestos analysis, they can still be used to determine asbestos content.

6 Reagents and materials

6.1 Asbestos standard samples. Chrysotile, tremolite, actinolite, anthophyllite, amosite, crocidolite.

6.2 Vermiculite standard sample.

6.3 Impregnation solution. Refractive indices () of 1.550, 1.605, 1.630, 1.680, 1.700, respectively.

6.4 Formic acid. Analytically pure.

6.5 Water. Grade III water as specified in GB/T 6682.

6.6 Isopropyl alcohol. Analytically pure.

6.7 Potassium chloride aqueous solution. Analytically pure, concentration 1 mol/L.

6.8 Slides. Colorless, transparent glass. Cleanliness shall meet the requirements of surface cleanliness and be free of visible pits, particles, stones, scratches, cracks, etc.

6.9 Cover glass. Colorless, transparent glass. Cleanliness shall meet the requirements of surface cleanliness and be free of visible pits, particles, stones, scratches, cracks, etc.

6.10 Other items. Crucible, standard sieve, conical flask, dropper, pipette, brush, conductive tape (or double-sided tape), scissors, ear bulb, etc.

7 Instruments and equipment

7.1 X-ray diffractometer (XRD). The goniometer's angle measurement accuracy shall be better than 0.02° (2 θ); the instrument's resolution shall be better than 60%; the overall stability shall be better than $\pm 1\%$. The technical specifications of the X-ray diffractometer for qualitative and quantitative asbestos analysis shall comply with the requirements in Appendix A.

7.2 Polarizing light microscope (PLM). The specifications of the polarizing light microscope shall comply with the requirements in Appendix B.

7.3 High-temperature furnace. Meet the temperature range of room temperature to 600°C , with an accuracy of not less than 10°C .

7.4 Oven. Meet the temperature range of room temperature to 300°C , with an accuracy of not less than 5°C .

7.5 Magnetic stirrer.

7.6 High-speed centrifuge. Speed 5000 rpm ~ 15000 rpm.

7.7 Ultrasonic cleaner.

7.9 Analytical balance. Accuracy of not less than 0.0001 g.

7.10 Constant temperature water bath. Meet the temperature range of room temperature to 100°C , with an accuracy of not less than 0.5°C .

7.11 Filter. Equipped with a 25 mm diameter fluororesin-bonded glass fiber filter.

7.12 Pulverizing equipment. Meet the test requirements specified in this document. Mortars (porcelain, agate, aluminum, etc.), Violet mills, ultra-centrifugal grinders, vibrating grinders, ball mills, etc. may be used, singly or in combination.

8.1 Sample collection method

8.1.1 Samples shall be collected from factory-produced or imported building materials, friction materials, sealing materials, insulation materials, non-metallic minerals. When collecting samples, the collector shall take appropriate protective measures to protect themselves from inhaling asbestos dust (hereinafter referred to as "dust").

8.1.2 When collecting samples at the production site, care should be taken to maintain the original condition and use sharp knives to collect samples, to avoid scattering dust.

8.1.3 When collecting samples from products, they shall be collected representatively from each batch.

8.1.4 The sample size shall be representative of the product being tested. For example, for soft materials such as spray coatings and insulation, 3 sets of samples, each approximately