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NATIONAL STANDARD OF THE PEOPLE'S REPUBLIC OF CHINA

GB/T 20210-2026

Replacing GB/T 20210-2006

Fireworks - Aluminium powder

烟花爆竹 铝粉

Issued on: February 27, 2026 **Implemented on: June 1, 2026**

Issued by: State Administration for Market Regulation;
Standardization Administration of the PRC

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1 Scope

GB/T 20210-2026 is the Chinese national standard covering aluminium powder for pyrotechnics - flake and atomised grades, their fineness and active content, and the handling of a material whose dust is itself an explosion hazard in the factory that uses it. It replaces GB/T 20210-2006 and has been in force since 1 June 2026. It was issued on 27 February 2026 and has been in force since 1 June 2026, replacing GB/T 20210-2006. The

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document is under the responsibility of the China National Light Industry Council. This page is published from the official record of the 2026 edition; the clause text of a standard this recent is not yet in circulation, and the figures, limits and tables it contains are those of the document itself, delivered in full with the English translation.

This document specifies the classification, grading, technical requirements, inspection rules, packaging, marking, transportation, and storage of aluminum powder used in fireworks and firecrackers, and describes related aspects. The corresponding testing method. This document applies to the manufacturing and acceptance of aluminum powder for fireworks and firecrackers.

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4 Classification and Grading

4.1 According to particle size and application, aluminum powder is divided into three categories. coarse aluminum powder, fine aluminum powder, and composite aluminum powder.

4.2 According to their different production processes, they are divided into three main categories. dry grinding, wet grinding, and atomization, as shown in Table

1.Common production process flows are shown in Appendix A.

4.3 Based on product quality, aluminum powder is classified into premium grade, grade 1, grade 2, and grade 3; composite aluminum powder is classified into type I and type II.

5 Technical Requirements

5.1 Appearance The color should be silver-gray to grayish-black, free of foreign matter and lumps.

5.2 Particle size

5.2.1 Aluminum powder products should be labeled with particle size.

5.2.2 All aluminum powders shall have a nominal particle size of less than 25 μm (500 mesh), and coarse aluminum powders shall have a nominal particle size of 75 μm (200 mesh) to 425 μm (40 mesh). When using the sieving method for testing, the amount of material passing through a 25μm (500 mesh) sieve should be less than or equal to 10%, and the amount of material remaining on the sieve corresponding to the nominal particle size should be... Less than or equal to 5%; when using laser diffraction for detection, the D10 particle size should be less than or equal to 30 μm, and the D90 particle size should be less than or equal to the nominal particle size. Degree ±30μm.

5.3 Chemical composition The chemical composition of aluminum powder used in fireworks and firecrackers should comply with the provisions of Table 2.

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6.1 General Provisions

6.1.1 For technical indicators involving identification and sensory aspects, visual inspection methods shall be adopted, and the relevant requirements of the standard shall be verified during inspection.

6.1.2 Test methods with the same or higher precision and accuracy may be used.

6.2 Visual Inspection Visual inspection.

6.3.1 Sieving Method (Arbitration Method)

6.3.1.1 Method Principle A certain amount of sample is placed on a standard sieve, and with the aid of vibration, it passes through a standard sieve with a certain mesh size. The amount of material remaining on (or below) the sieve is then measured. The content of the material on (or below) the sieve of this mesh size can be calculated accordingly.

6.3.1.2 Equipment and Instruments 6.3.1.2.1 Standard sieve. It shall meet the requirements of GB/T 6003.1, with a sieve frame size of phi200mmx50mm, and the sieve mesh aperture range of the sieve assembly. 24μm (550 mesh) or above. 6.3.1.2.2 Vibrating Screen. An eccentric vibrating screen (i.e., during the screening process, it causes the standard sieve to oscillate in a circular motion and vibrate up and down). (Oscillating motion) The frequency is 290 times/min, and the vibration is 145 times. 6.3.1.2.3 Antistatic soft brush. 6.3.1.2.4 Electronic balance. accuracy 0.0001g. 6.3.1.2.5 Stopwatch. Accuracy is 0.01s.

6.3.1.3 Determination Procedure (Method 1 - Mechanical Sieving Method) 6.3.1.3.1 Select a standard sieve group according to the technical conditions of aluminum powder. 6.3.1.3.2 Stir the sample thoroughly and weigh 10.00g of the sample, accurate to 0.0001g. 6.3.1.3.3 Place the sample on the upper sieve, cover it with the pressure cap, and fasten the standard sieve group to the vibrating sieve machine. Vibrate for 10 minutes. 6.3.1.3.4 Remove the standard sieve set and weigh the aluminum powder from the upper sieve and the lower sieve respectively.

6.3.1.4 Determination Procedure (Method 2 - Manual Sieving Method) 6.3.1.4.1 Select a standard sieve group according to the technical conditions of aluminum powder. 6.3.1.4.2 Stir the sample thoroughly and weigh 10.00g of the sample, accurate to 0.0001g. 6.3.1.4.3 Place the sample on the upper sieve and gently brush and manually sieve the sample with a clean soft brush. 6.3.1.4.4 After the samples on the upper sieve are sieved, the samples on the lower sieve are manually sieved according to 6.3.1.4.3. 6.3.1.4.5 Disassemble the standard sieve set and weigh the aluminum powder from the upper sieve and the lower sieve respectively. If the sieving loss exceeds 1%, the sieve set should be reassembled. Sampling and testing.

6.3.1.5 Calculation of Measurement Results 6.3.1.5.1 Calculate the mass fraction of aluminum powder on the upper sieve according to formula (1).

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6.3.2 Laser Diffraction Method

6.3.2.1 Method Principle When a laser beam irradiates metal powder particles dispersed in a liquid medium, scattering occurs, and particles of different sizes produce unique scattering effects. Characterizing the scattered light pattern. The instrument receives scattered light signals through detectors distributed at different angles, and then uses optical theory and mathematical models to analyze these scattered light signals. The optical signal is used to deduce the particle size distribution of the powder sample based on volume.

6.3.2.2 Equipment and Instruments 6.3.2.2.1 Laser Particle Size Analyzer. Suitable for particle size determination of micron-sized samples, equipped with solvent-based or micro-sample cell injection system, providing accurate particle size measurement. The deviation should not be less than 0.5% (D50 deviation of national or international standard). 6.3.2.2.2 Ultrasonic disperser. frequency not less than 15kHz.

6.3.2.3 Reagents and Materials Anhydrous ethanol (AR).

6.3.2.4 Measurement Procedure 6.3.2.4.1 Stir the sample thoroughly, take about

0.3 g of the sample into a 50 mL beaker, add 20 mL of anhydrous ethanol, and ultrasonically disperse until the powder is dispersed. No aggregation was observed, indicating that this is test solution A. 6.3.2.4.2 Set the sample parameters and input the sample information on the operating software according to the instrument's instruction manual. 6.3.2.4.3 Add anhydrous ethanol as the circulating medium, adjust the stirring speed and the injection pump speed, and test the instrument background. 6.3.2.4.4 After measuring an effective background, add test solution A to the injection system using a dropper to make the occlusion 5%~30%. 6.3.2.4.5 Click the "Start" button on the operating software to begin the measurement. 6.3.2.4.6 After the measurement is completed, check and record the results (D10 and D90).

6.3.2.5 Expression of Measurement Results Two results were measured for each sample in parallel, with an allowable difference of no more than 0.2 μm. The arithmetic mean of the results was taken and the results were retained to two decimal places.

6.4 Aluminum content

6.4.1 Method Principle The sample was dissolved in hydrochloric acid. Under conditions of pH 2.5-2.8, aluminum and other metal ions complexed with disodium ethylenediaminetetraacetate. When the concentration is 5-6, excess disodium ethylenediaminetetraacetate is titrated with zinc standard solution, then aluminum is displaced with fluoride, releasing a fixed amount of ethylenediaminetetraacetate. The aluminum content was determined by titrating the released disodium ethylenediaminetetraacetate with a zinc standard solution. The test solution contained... 1

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