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

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**Particles - Laser particle size analysers - Technical
requirements**

颗粒 激光粒度分析仪 技术要求

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Foreword

This document is in accordance with the provisions of GB/T 1.1-2020 "Guidelines for Standardization Work Part

1. Structure and Drafting Rules for Standardization Documents" drafting. Please note that some contents of this document may refer to patents. The issuing agency of this document assumes no responsibility for identifying patents. This document was proposed and managed by the National Particle Characterization and Sorting and Sieve Mesh Standardization Technical Committee (SAC/TC168). This document is drafted by: China Institute of Metrology, Zhuhai Truth Optical Instrument Co., Ltd., Hefei Hongmeng Institute of Standard Technology Co., Ltd., Dandong Baite Instrument Co., Ltd., China Jiliang University, Jinan Micro-Nano Particle Instrument Co., Ltd., Chengdu Jingxin Powder Testing Equipment Co., Ltd., Institute of Process Engineering, Chinese Academy of Sciences, Horiba (China) Trading Co., Ltd., Shanghai Spectris Instrument System Co., Ltd.

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A laser particle size analyzer is an instrument used to measure particle size and its distribution. The measurement object can be dispersed in various continuous phase media Phases, including solid particles, bubbles, and liquid droplets in liquid media (e.g., oil in water or water in oil), solid particles and liquid in gaseous media Drip and so on. Usually, when measuring granular samples with this type of instrument, it is necessary to disperse the sample. When the dispersion medium is liquid, it is called "wet method". When the dispersion medium is gas, it is called "dry method measurement", and the corresponding dispersion device is called "Dry sampler" (measurement of solid particles and liquid droplets in gaseous media does not require a sampler). Compared with other particle size measuring instruments, laser The particle size analyzer has the advantages of wide particle size measurement range, fast measurement speed, good measurement repeatability and convenient operation. At present, the current standards related to laser particle size analyzer mainly include ISO 13320.2020 and GB/T 19077-2016.above standard Focus on describing the measurement principle, standard operation requirements and precautions of the laser particle size analyzer, such as sample preparation, reasonable control of the concentration of the measurement, etc. Production and test reports, etc., but not much is involved in the specific technical performance requirements of the laser particle size analyzer. During the manufacture and use of the laser particle size analyzer, the manufacturing units and users are most concerned about its performance index. Importance of this document to the instrument Specific requirements for reproducibility, accuracy, resolution and lower limit of detection of D50 are put forward to standardize the production and publicity behavior of instrument manufacturers and to facilitate different practices. Comparing particle size results between laboratories is helpful for users to choose a laser particle size analyzer that suits their needs. Technical requirements for particle laser particle size analyzer

1 Scope

China's national technical requirements for laser particle size analysers. The instrument is

the standard tool for measuring a particle size distribution: a dispersed sample passes through a laser beam, the scattered light is collected at many angles, and the distribution is computed from the pattern. Its virtues are speed and reproducibility - a measurement takes a minute and repeats closely. Its limitation is inherent and often forgotten: it does not measure particles, it measures a scattering pattern and infers the distribution of spheres that would have produced it. For irregular, plate-like or fibrous particles that inference is a model rather than a measurement, and different instruments applying different optical models to the same sample give systematically different answers. The technical requirements matter for exactly that reason: they fix what the instrument must do so that its result is at least comparable with another instrument's, which is the most that can be asked of it.

This document describes the principle and structure of the laser particle size analyzer, specifies the technical requirements, marking, packaging and transportation of the laser particle size analyzer and storage. This document applies to laboratory laser particle size analyzers based on the principle of scattered light spatial distribution.

2 Normative references

The contents of the following documents constitute the essential provisions of this document through normative references in the text. Among them, dated references For documents, only the version corresponding to the date is applicable to this document; for undated reference documents, the latest version (including all amendments) is applicable to this document.

GB/T 191 Packaging, storage and transportation icon marks

GB/T 13384 General Technical Specifications for Packaging of Mechanical and Electrical Products

GB/T 16418-2008 Granular System Terminology

3 Terms and Definitions

The following terms and definitions defined in GB/T 16418-2008 apply to this document.

3.1 It is an instrument for measuring particle size distribution based on the principle of scattered light spatial distribution with laser as the main light source.

3.2 Accompanied by a document issued by an authoritative body, providing one or more characteristic values with uncertainty and traceability obtained using valid procedures. standard material.

3.3 Cumulative particle size cumulativediameter D_n The geometric mean particle diameter corresponding to the n th percentile of the cumulative particle size distribution from small to large.

Note. In general, n is an integer; the common ones are D5, D10, D50, D90, D95, etc., depending on the specific industry and application.

3.4 median diameter The geometric mean particle diameter corresponding to the 50th percentile of the cumulative particle size distribution from small to large.

Note. The median particle size is written as D50 or X50. [Source: GB/T 16418-2008, 2.2.1.9, modified]

3.5 The minimum D50 value that the instrument can accurately measure.