

ICS 19.120
CCS A 28



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

GB/T 29024.2-2025

Replacing GB/T 29024.2-2016

**Determination of particle size distribution - Single particle light
interaction methods - Part 2: Light scattering liquid-borne
particle counter**

粒度分析 单颗粒的光学测量方法 第2部分:光散射法液体颗粒计数器

(English Translation)

Issued on: June 30, 2025

Implemented on: January 1, 2026

**Issued by: State Administration for Market Regulation, China National
Standardization Administration**

Table of Contents

Preface	
Introduction	
1 Scope	
2 Normative references	
3 Terms and Definitions	
4 Principle	
5 Basic Configuration	
6 Performance Requirements	
6.1 Particle size setting error	
6.2 Counting efficiency	
6.3 Particle size resolution	
6.4 False Count	
6.5 Maximum particle number concentration	
6.6 Sampling flow error	
6.7 Sampling time error	
6.8 Sampling volume error	
6.9 Calibration Interval	
6.10 Test and calibration reports	
7 Testing and calibration procedures	
7.1 Particle size setting	
7.2 Counting efficiency evaluation	
7.3 Particle size resolution evaluation	
7.4 False Count Evaluation	
7.5 Evaluation of Overlap Losses at Maximum Particle Number Concentration	
7.6 Sampling flow rate error assessment	
7.7 Sampling Time Error Evaluation	
7.8 Sampling Volume Error Assessment	
Appendix A (Informative) Counting Efficiency	
Appendix B (Informative) Particle Size Resolution	
Appendix C (Informative) False Count Rate	
Appendix D (Informative) Procedure for evaluating uncertainty of measurement results	
Reference	

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.

This document is part 2 of GB/T 29024 "Particle size analysis - Optical measurement of single particles". GB/T 29024 has been published.

The following sections.

- Part 2: Light scattering liquid particle counter;
- Part 3: Light obstruction method for liquid particle counters;
- Part 4: Clean room light scattering particle counter.

This document replaces GB/T 29024.2-2016 "Particle size analysis - Optical measurement of single particles - Part 2: Liquid particle counting" Compared with GB/T 29024.2-2016, in addition to structural adjustments and editorial changes, the main technical changes are as follows.

- Changed the scope (see Chapter 1, Chapter 1 of the 2016 edition);
- Changed the terms and definitions of calibration particles (see 3.1, 3.1 of the 2016 edition);
- Added a chapter on principles (see Chapter 4);
- Added a chapter on basic configuration (see Chapter 5);
- Changed some performance requirements (see Chapter 6, Chapter 3 of the 2016 edition);
- Changed some calibration procedures (see Chapter 7, Chapter 4 of the 2016 edition).

This document is equivalent to ISO 21501-2:2019 "Particle size analysis - Optical measurement methods for single particles - Part 2: Light scattering method for liquids" Particle Counter.

Introduction

Many fields require monitoring of particle contamination, such as the electronics industry, pharmaceutical industry, precision instrument (machinery) manufacturing industry, and medical field.

Particle counters are effective devices for monitoring particulate contaminants in liquids. This document is intended to provide calibration procedures and verification methods for particle counters.

Methods are used to ensure the accuracy of particle counter measurement results and the consistency of measurement results of different instruments.

GB/T 29024 "Particle size analysis - Optical measurement of single particles" is a standard for particle counter measurement, calibration and verification methods.

It is mainly used to determine the particle size and quantity in the air or liquid, and consists of four parts.

--- Part 1: Light scattering aerosol spectrometer. Describes the measurement, calibration and verification methods of an optical aerosol particle counter.

--- Part 2: Light scattering liquid particle counter. Describes a method for measuring the particle size and number concentration of particles suspended in liquids.

Measurement, calibration and verification methods for light scattering liquid particle counters.

--- Part 3: Light obscuration liquid particle counter. Describes a method for measuring the particle size and number concentration of particles suspended in liquids.

Measurement, calibration and verification methods for light obscuration liquid particle counters.

--- Part 4: Cleanroom light scattering particle counter. Describes the optical particle counter used to determine the particle size distribution of airborne particles.

Methods of measurement, calibration and verification of counters.

Optical measurement method for single particle size analysis Part 2: Light scattering liquid particle counters

1 Scope

This document specifies a light scattering liquid particle counter for measuring the size and number concentration of particles suspended in liquids.

(LSLPC) measurement, calibration and verification method. The light scattering method described in this document is based on single particle scattering measurements.

The typical particle size range is between 0.1 μ m and 10 μ m.

This method is suitable for evaluating the cleanliness of pure water and chemical reagents, as well as measuring the particle number concentration and particle size distribution in various liquids.

The particle size measured by this method depends on the refractive index of the particle and the liquid medium, so the obtained particle size is the equivalent of the calibration particle in pure water.

Effective particle size.

This document contains the following.

- Particle size setting error;
- Counting efficiency;
- Particle size resolution;
- False count rate;
- Maximum particle number concentration;
- Sampling flow error;
- Sampling time error;
- Sampling volume error;
- Calibration interval;
- Test and calibration report.

2 Normative references

This document has no normative references.

3 Terms and Definitions

The following terms and definitions apply to this document.

calibration particle Monodisperse spherical particles of known average particle size, such as polystyrene latex spheres (PSL), whose standard values can be traced back to the International System of Units.

(SI), the standard uncertainty of the mean diameter is no more than 2.5%. At a wavelength of 589nm (sodium D line), the refractive index of polystyrene latex particles is Approximately 1.59.

NOTE: For spherical particles, the particle size is equal to the diameter.

Counting efficiency

The ratio of the particle number concentration obtained by the light scattering liquid particle counter (3.4) and the reference instrument when measuring the same sample.