AS ISO 13319.2:2026
ISO 13319-2:2023

Determination of particle size distribution — Electrical sensing zone method

Part 2: Tunable resistive pulse sensing method



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Requirements

To conform to a Standard, all requirements in the Standard need to be met.

A requirement is any statement in the Standard which uses the word "shall".

Recommendations, permissions and possibilities

The following words are commonly used in Standards, but statements using them do not have to be followed to conform to the Standard:

(a) "should" means that something is recommended.

(b) "may" means that something is permitted.

(c) "can" means that something is possible.

Structure of Standards

A Standard always has the following parts:

(i) The Preface states who developed the Standard, what the Standard is aiming to do, and how it relates to other documents.

(ii) The Scope states what the Standard is about, what it covers and what it does not cover.

(iii) The Normative references clause lists other documents that are referenced in the Standard as part of requirements.

(iv) The Terms and definitions clause defines important terms to help with understanding the Standard.

A Standard may also include other parts, such as the following:

(1) A normative appendix sets additional requirements that need to be conformed to.

(2) An informative appendix provides additional information or guidance. They usually do not contain requirements. If an informative appendix does contain requirements, the Standard will explain when those requirements apply.

(3) A Bibliography lists documents referenced in the Standard but not as part of requirements.

Many Standards include notes. Notes provide recommendations and/or guidance only. They never contain requirements.

Preface

This Standard was prepared by the Standards Australia Committee NT-001, Nanotechnologies.

The objective of this document is to specify the measurements of particle size distribution and concentration of suspended particles, ranging from 40 nm to 100 µm, using tunable resistive pulse sensing (TRPS). This document provides a comprehensive overview of the methodologies that are applied to achieve reproducible and accurate TRPS measurement results. This document also includes best practice considerations, possible pitfalls and information on how to alleviate or avoid these pitfalls.

This document is identical to, and has been reproduced from, ISO 13319-2:2023, *Determination of particle size distribution — Electrical sensing zone method — Part 2: Tunable resistive pulse sensing method*.

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO document should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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This document was prepared by Technical Committee ISO/TC 24, *Particle characterization including sieving*, Subcommittee SC 4, *Particle characterization*.

A list of all parts in the ISO 13319 series can be found on the ISO website.

Any feedback or questions on this document should be directed to the user’s national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

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Introduction

Monitoring particle size distributions and particle concentrations are required in various fields, where particle dispersions in liquid play a role. The electrical sensing zone technique has, since its discovery by W. H. Coulter around 1950, been widely employed for size and count analysis of (blood) cells, bacteria and other fine particles. Over the last decades, the application range has expanded to nanoparticles, such as liposomes, exosomes, and nano- and micro-bubbles, as a result of improved electronics and aperture fabrication. The tunable electrical sensing zone technique is useful for the determination of the size distribution, concentration and zeta potential of micro- and nanoparticles suspended in a liquid. The purpose of this document is to provide the background and procedures for application of tunable electrical sensing zone equipment for particle size distribution and concentration measurements, so as to improve the reproducibility and the accuracy of the acquired results.

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Determination of particle size distribution — Electrical sensing zone method

Part 2: Tunable resistive pulse sensing method

1 Scope

This document specifies the measurements of particle size distribution and concentration of suspended particles, ranging from 40 nm to 100 µm, using tunable resistive pulse sensing (TRPS). This document provides a comprehensive overview of the methodologies that are applied to achieve reproducible and accurate TRPS measurement results. This document also includes best practice considerations, possible pitfalls and information on how to alleviate or avoid these pitfalls.

2 Normative references

There are no normative references in this document.

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at https://www.electropedia.org/

3.1
aperture
small diameter hole through with suspension is drawn

[SOURCE: ISO 13319-1:2021, 3.2]

3.2
sensing zone
volume of electrolyte within and around the aperture in which a particle is detected

[SOURCE: ISO 13319-1:2021, 3.3]

3.3
pulse frequency
number of pulses per duration

3.4
detection range
size range between the smallest and largest detectable particle diameter

3.5
dynamic range
ratio between the largest and smallest detectable particle diameter

3.6
electrokinetics
phenomena that are associated with the tangential liquid motion in respect to a charged surface

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