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**Preparation of particulate reference materials - Part 1:
Polydisperse material based on picket fence of monodisperse
spherical particles**

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Table of Contents

Preface	
Introduction	
1 Scope	1
2 Normative references	1
3 Terms, definitions and symbols	1
3.1 Terms and Definitions	1
3.2 Symbol	2

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 1 of GB/T 42351 "Preparation of Particle Standard Samples". GB/T 42351 has issued the following parts.

--- Part 1. Polydisperse standard samples based on the distribution of monodisperse spherical particle picket fences.

This document is equivalent to ISO /T S14411-1.2017 "Preparation of Particle Standard Samples Part 1. Based on Monodisperse Spherical Particle Tips"

Polydisperse Standard Samples of Pile Fence Distribution", the document type is adjusted from the ISO technical specification to the national standard of our country.

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).

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Introduction

A variety of techniques can be used to measure the particle size distribution, among which when measuring a certain one-dimensional characteristic of the particle, the particle is usually equivalent to a

An ideal model with equivalent particle size (usually a sphere), so in general, some other constants are required or assumed to calculate the particle size

particle size distribution. Due to the different measurement properties of different technologies, the equivalent granularity becomes a measurand defined by the method, so it is necessary to

Use the same method or a standardized method to compare the results.

At present, through in-depth research on the influencing factors of different methods, the lack of comparability between methods can be improved.

Italian situation. Since the link between different methods is related to the sample material, it is very important that the material satisfies as many physical assumptions as possible in the method.

important. Known quantities of monodisperse spherical particle components are used to form a polydisperse mixture by mixing (as in "picked fence" fractions).

cloth) is a feasible method.

Since most particle size measurement methods assume that the particles are spherical, a single particle should be spherical. If the actual use

The particles are spherical, so in terms of shape, the measurement results using different methods should agree. The advantage of spherical particles is that their size is only

One parameter can be expressed, that is, particle diameter.

Each component in the mixture needs to be monodisperse, so that the diameter of the particle can be traced to the

Standard size, and finally a mixture with a theoretically known particle size distribution.

These materials are used in the following ways.

Monodisperse particulate matter fractions can be used to verify equivalence between measurements using ideal particulate matter. If a method gives the result

If it deviates, it shows that this method has not been thoroughly studied, and further research on the deviation is needed. Polydisperse mixtures can be used for test methods

Verify and observe its output. The results presented are a comprehensive evaluation of the method, including particle dispersion, migration, physical principles, and formation

Method evaluation with more comparable results, etc. The method described in this paper is based on Ref. [22] and Ref. [23].

The second usage is applied to the development of theoretical frameworks for more accurate measurements of particle size distributions. In order to apply different particle size measurement methods

method, this usage is fundamentally limited to spherical particles of equal density.

This document describes a protocol for the preparation of a quasi-monodisperse spherical particle standard sample for the picket-fence distribution.

GB/T 42351 aims to provide standard samples for comparison of the results of different particle size measurement techniques, and specifies the materials,

Preparation and characterization, consisting of two parts.

--- Part 1. Polydisperse standard samples based on the distribution of monodisperse spherical particle picket fences. Describes the polydisperse standard sample

Materials and Preparation.

--- Part 2. Polydisperse spherical particles. Describes the normative requirements and uncertainty and reliability tests of polydisperse standard samples.

Part 1 specifies the preparation of polydisperse standard samples, and Part 2 describes the specifications of polydisperse standard samples.

Preparation of Particulate Standard Samples

Part 1. Based on monodisperse spherical particles

Polydisperse standard sample of picket fence distribution

1 Scope

This document describes the preparation of polydisperse spherical particles based on the picket fence distribution of quasi-monodisperse standard samples and has acceptable

Monodisperse component characterization with certainty, and uncertainty assessment for particle mixtures. Under appropriate technical constraints, this material is usually suitable for

For all particle characterization methods. This document lists the application of this standard sample in the reliability calculation based on mass cumulative particle size distribution.

This document is applicable to the certified and

Undocumented standard sample preparation technical characteristics outside the general requirements.

2 Normative references

This document has no normative references.

3.1 Terms and Definitions

The following terms and definitions apply to this document.

3.1.1

aspect ratio aspectratio

The ratio of the shortest diameter to the longest diameter of a particle feret.

[Source. ISO 26824.2013, 4.5, with modifications]

3.1.2

Pycnometry pycnometry

In the case of a given calibration volume, the method of obtaining the particle density according to the mass of the measured sample.

[Source. ISO 26824.2013,2.4]

3.1.3

In the dry state, the mass of the particle divided by the volume it occupies (including all pores and surface fissures, open or closed).

[Source. GB/T 26645.4-2018, 3.1, modified]

3.1.4