International Standard

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Representation of results of particle size analysis —

Part 1: Graphical representation

Représentation de données obtenues par analyse granulométrique —

Partie 1: Représentation graphique

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Foreword

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

This third edition cancels and replaces the second edition (ISO 9276-1:1998), which has been technically revised. It also incorporates the Technical Corrigendum ISO 9276-1:1998/Cor 1:2004.

The main changes are as follows:

— Clause 3 has been added;

— Formulae (9) and (10) have been added in 7.2;

— Clauses 8 and 9 have been added;

— Annex B and Annex C have been added.

A list of all parts in the ISO 9276 series can be found on the ISO website.

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Introduction

The characterization of a dispersed phase with respect to its particle size distribution (PSD) is a major task, whenever the generation, emission, transport, application or consumption of particulate matter is monitored or investigated. The spectrum of relevant materials is very broad and "particle" can refer to grains, flakes, fibres, droplets, bubbles, micelles or pores. Within a particulate material, particles typically vary with regard to their size. The distribution of this measurand is characterized by the relative quantity of particles belonging to a specific size class.

There are a wide range of methods for the size analysis of particulate matter. For many reasons, the results will, in general, not be the same. One of the main problems still encountered with most methods in use is their unknown absolute accuracy. Apart from this, there are two principal origins of the differences among measured PSDs.

Firstly, the measurand "particle size" is an ambiguous property being specified by the measurement principle of the instrumentation and the way of signal analysis. Both specifications define the type of particles which are intrinsically measured: agglomerates or their constituent particles; Pickering emulsion droplets or the nanoparticles at their surface; complete core-shell particles or the core of the particles only. Therefore, “size” can refer to a variety of physical and geometric properties.

Secondly, the distribution of size can be measured and expressed by different types (and measures) of quantity.[1]

A disperse system can be described by different types of PSD, which supplement each other in providing a comprehensive view on the granulometric state of the particulate material. Moreover, each type of PSD can be represented in various manners.

Beside numerical and mathematical representations, graphical ones are particularly popular and useful because they allow for a quick comprehension of the main PSD features or a fast evaluation of differences among product lots. There are various ways of plotting a PSD, which emphasize different details though communicating the same information. This requires explanation, especially when a PSD is described by discrete data.

A harmonized view on terms and a common understanding of how to graphically plot and interpret PSDs support the communication between suppliers and clients and improve the comparability of measurement data from different instruments.