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ISO 9276-4:2001
Reconfirmed 2016

Australian Standard™

Representation of results of particle size analysis

Part 4: Characterization of a classification process

Standards Australia

This Australian Standard was prepared by Committee CH-032, Particle Size Analysis. It was approved on behalf of the Council of Standards Australia on 30 April 2002 and published on 20 June 2002.

The following are represented on Committee CH-032:

Australian Pre-mixed Concrete Association

CSIRO Land and Water

Queensland University of Technology

Royal Australian Chemical Institute

Science Industry Australia Inc

University of South Australia

The University of Sydney

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STANDARDS AUSTRALIA

RECONFIRMATION

OF
AS 4932.4—2002
Representation of results of particle size analysis
Part 4: Characterization of a classification process

RECONFIRMATION NOTICE

Technical Committee NT-001 has reviewed the content of this publication and in accordance with Standards Australia procedures for reconfirmation, it has been determined that the publication is still valid and does not require change.

Certain documents referenced in the publication may have been amended since the original date of publication. Users are advised to ensure that they are using the latest versions of such documents as appropriate, unless advised otherwise in this Reconfirmation Notice.

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NOTES

Australian Standard™

Representation of results of particle size analysis

Part 4: Characterization of a classification process

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PREFACE

This Standard was prepared by the Standards Australia Committee CH-032, Particle Size Analysis. This Standard is identical with and has been reproduced from ISO 9276-4:2001, *Representation of results of particle size analysis*, Part 4: *Characterization of a classification process*.

The objective of this Standard is to provide the mathematical background for the characterization of a classification process. The Standard is not limited to an application in particle size analysis, the same procedure may be used for the characterization of a technical classification process (e.g. air classification or, centrifugal classification) or a separation process (e.g. gas or hydrocyclones).

In Clause 4 the characterization of a classification process is described under the presupposition that the density distribution curves describing the feed material and the fractions, as well as the overall mass balance, are free from errors. In Clause 5 the influence of systematic errors on the efficiency of a classification process is described. The effect of stochastic errors in the characterization of a classification process is described in Annex A.

This Standard is part of a series comprising:

AS		
4932	Representation of results of particle size analysis	
4932.1	Part 1:	Graphical representation
4932.2	Part 2:	Calculation of average particle sizes/diameters and moments from particle size distribution
4932.4	Part 4:	Characterization of a classification process

As this Standard is reproduced from an International Standard, the following applies:

(a) Its number appears on the cover and title page while the International Standard number appears only on the cover.

(b) In the source text, ‘this part of ISO 9276’ should read ‘this Australian Standard.’

(c) A full point substitutes for a comma when referring to a decimal marker.

(d) Substitute ‘mL’ for ‘ml’ wherever it appears.

(e) Clause 4.1 in the third line of the final paragraph, *insert* ‘be’ before ‘disregarded’.

(f) Annex A, Clause A.1, the final paragraph, line 1, should read ‘these curves’.

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INTRODUCTION

In classification processes used in particle size analysis, such as occurring in impactors, sieves, etc., the mass of the supply or feed material, m_s, or its number, n_s, of particles, the particle size distribution of which is described by its density distribution, $q_{r,s}(x)$, is separated into at least one fine fraction of mass, m_f, or number, n_f, and of density distribution, $q_{r,f}(x)$ and a coarse fraction of mass, m_c, or number, n_c, and a density distribution, $q_{r,c}(x)$. The type of quantity chosen in the analysis is described by the subscript, r, the supply or feed material and the fine and coarse fractions by the additional subscripts: s; f and c respectively. See Figure 1.

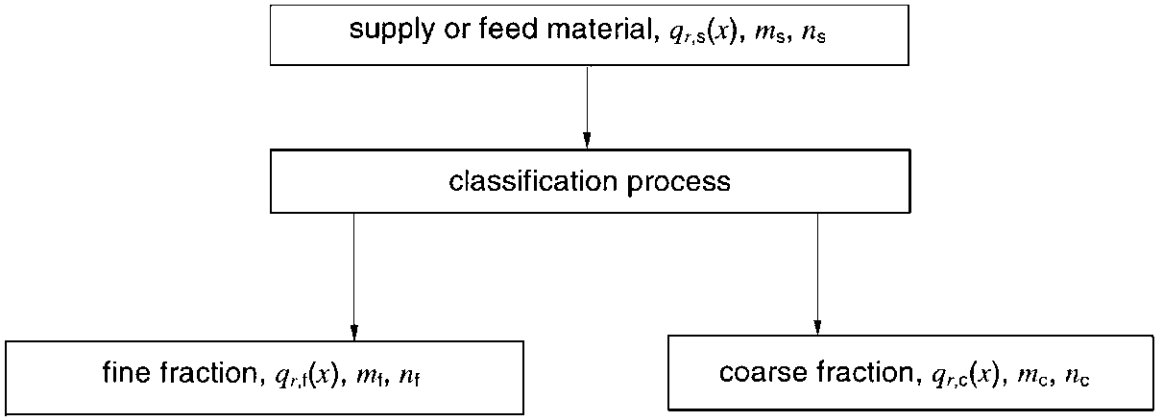

Figure 1 — Fractions and distributions produced in a one step classification process

For the characterization of processes with more than one coarse fraction, e.g. cascade impactors, s, f and c can be replaced by numbers 0, 1 and 2. In this case e.g. number 3 describes a second coarse fraction containing larger particles than fraction 2.

It is assumed that the size, x, of a particle is described by the diameter of a sphere. Depending on the problem, the particle size, x, may also represent an equivalent diameter of a particle of any other shape.

AUSTRALIAN STANDARD

Representation of results of particle size analysis —

Part 4:
Characterization of a classification process

1 Scope

The main object of this part of ISO 9276 is to provide the mathematical background for the characterization of a classification process. This part of ISO 9276 is not limited to an application in particle size analysis, the same procedure may be used for the characterization of a technical classification process (e.g. air classification, centrifugal classification) or a separation process (e.g. gas or hydrocyclones).

In clause 3 the characterization of a classification process is described under the presupposition that the density distribution curves describing the feed material and the fractions, as well as the overall mass balance, are free from errors. In clause 4 the influence of systematic errors on the efficiency of a classification process is described. The effect of stochastic errors in the characterization of a classification process is described in annex A.