AS 5009.1—2003
ISO 13318-1:2001
Reconfirmed 2016

Australian Standard™

Determination of particle size distribution by centrifugal liquid sedimentation methods

Part 1: General principles and guidelines

Standards Australia

This Australian Standard was prepared by Committee CH-032, Particle Analysis. It was approved on behalf of the Council of Standards Australia on 28 February 2003 and published on 10 April 2003.

The following are represented on Committee CH-032:

Australian Pre-Mixed Concrete Association

CSIRO Land and Water

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This Standard was issued in draft form for comment as DR 02430.

STANDARDS AUSTRALIA

RECONFIRMATION

OF

AS 5009.1—2003

Determination of particle size distribution by centrifugal liquid sedimentation methods

Part 1: General principles and guidelines

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.

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Approved for reconfirmation in accordance with Standards Australia procedures for reconfirmation on 9 September 2016.

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NOTES

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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 13318-1:2001, *Determination of particle size distribution by centrifugal liquid sedimentation methods,* Part 1: *General principles and guidelines.*

The objective of this Standard is to specify guidance on the measurement of the size distributions of particulate materials typically in the size range 0.1 μm to 5 μm, by centrifugal sedimentation in a liquid.

The methods of determining the particle size distribution described in this part of ISO 13318 are applicable to slurries, particulate materials which can be dispersed in liquids and some emulsions. A positive density difference between the discrete and continuous phases is necessary, although centrifugal photosedimentation can be used for emulsion where the droplets are less dense then the liquid in which they are dispersed.

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 13318' should read 'this Australian Standard'.

(c) A full point should be substituted for a comma when referring to a decimal marker.

(d) Substitute 'mL' for 'ml' wherever it appears.

(e) With exception of ISO 9276-1 which has been adopted as AS 4932.1, the ISO documents listed as a normative reference in Clause 2 have not been adopted as Australian Standards.

CONTENTS

INTRODUCTION

Centrifugal sedimentation particle size analysis methods are among those in current use for determining size distribution of many powders. Typically, centrifugal methods apply to samples in the 0.1 µm to 5 µm size range and where the sedimentation condition for a Reynolds number < 0.25 is satisfied.

No single method of size analysis can be specified to cover the many different types of material encountered, but it is possible to recommend procedures that may be applied to the majority of cases. The purpose of this Standard is to obtain uniformity in procedure of centrifugal methods in order to facilitate comparisons of size analysis made in different laboratories.

Centrifugal sedimentation methods may be undertaken—

(a) as part of a research project involving an investigation of the particle size distribution of a material;

(b) as part of a control procedure for the production of a material where the particle size distribution is important;

(c) as the basis of a contract for the supply of material specified to be within stated specification limits.

Gravitational sedimentation methods are discussed in AS 4816.1.

AUSTRALIAN STANDARD

Determination of particle size distribution by centrifugal liquid sedimentation methods

Part 1:

General principles and guidelines

1 Scope

This part of ISO 13318 covers methods for determining the particle size distributions of particulate materials, typically in the size range 0,1 µm to 5 µm, by centrifugal sedimentation in a liquid.

NOTE This part of ISO 13318 may involve the use of hazardous materials operations and equipment. This part of ISO 13318 does not purport to address all the safety problems associated with its use. It is the responsibility of the user of this part of ISO 13318 to establish appropriate safety and health practices and to determine the applicability of the regulatory limitations prior to its use.

The methods of determining the particle size distribution described in this part of ISO 13318 are applicable to slurries, particulate materials which can be dispersed in liquids and some emulsions. A positive density difference between the discrete and continuous phases is necessary, although centrifugal photosedimentation can be used for emulsions where the droplets are less dense than the liquid in which they are dispersed.

2 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this part of ISO 13318. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on this part of ISO 13318 are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. For undated references, the latest edition of the normative document referred to applies. Members of ISO and IEC maintain registers of currently valid International Standards.

ISO 758, *Liquid chemical products for industrial use — Determination of density at 20 ^{o}C*.

ISO 787-10, *General methods of test for pigments and extenders — Part 10: Determination of density — Pyknometer method*.

ISO 2591-1, *Test sieving — Part 1: Methods using test sieves of woven wire cloth and perforated metal plate*.

ISO 8213, *Chemical products for industrial use — Sampling techniques — Solid chemical products in the form of particles varying from powders to coarse lumps*.

ISO 9276-1, *Representation of results of particle size analysis — Part 1: Graphical representation*.

ISO 14887, *Sample preparation — Dispersing procedures for powders in liquids*.