

Australian Standard™

**Determination of particle size  
distribution by centrifugal liquid  
sedimentation methods**

**Part 2: Photocentrifuge method**

This Australian Standard was prepared by Committee CH-032, Particle Size Analysis. It was approved on behalf of the Council of Standards Australia on 5 November 2003 and published on 29 December 2003.

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The following are represented on Committee CH-032:

CSIRO Land and Water  
Queensland University of Technology  
The Royal Australian Chemical Institute  
Science Industry Australia Inc.  
University of South Australia  
The University of Sydney

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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 13318-2, *Determination of particle size distribution by centrifugal liquid sedimentation methods, Part 2: Photocentrifuge method*.

The objective of this Standard is to provide methods of determining the particle size distribution of particulate materials by means of centrifugal sedimentation in a liquid. Solids concentrations are determined by the transmission of a light beam. The resulting signal enables conversion to a particle size distribution.

The method of determining the particle size distributions described in this Standard is applicable to powders that can be dispersed in liquids, powders that are present in slurry form and some emulsions. Typical particle size range for analysis is from about 0.1  $\mu\text{m}$  to 5  $\mu\text{m}$ . The method is applicable to powders in which all particles have the same density and comparable shapes and do not undergo chemical or physical change in the suspension liquid. It is usually necessary that the particles have a density higher than 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 substitutes for a comma when referring to a decimal marker.
- (d) Substitute 'mL' for 'ml' whenever it appears.
- (e) In Annex C, Figure C.1, label Vertical axis 'Cumulative Mass % undersize'.
- (f) The term 'informative' has been used in this Standard to define the application of the annex to which they apply. An 'informative' annex is only for information and guidance.

Reference to International Standards should be replaced by the references to the following Australian Standards:

<i>Reference in International Standard</i>		<i>Australian Standard</i>	
ISO		AS	
13318	Determination of particle size distribution by centrifugal liquid sedimentation methods	5009	Determination of particle size distribution by centrifugal liquid sedimentation methods
13381-1	Part 1: General principles and guidelines	5009.1	Part 1: General principles and guidelines
14887	Sample preparation—Dispersing procedures for powders in liquids	4784	Sample preparation for particle size analysis—Dispersing procedures for powders in liquids

This Standard is part of a series comprising:

AS	
5009	Determination of particle size distribution by centrifugal liquid sedimentation methods
5009.1	Part 1: General principles and guidelines
5009.2	Part 2: Photocentrifuge method

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## INTRODUCTION

The sample suspension in a photocentrifuge may be contained in a cuvet or a disc. Sample concentration is determined by changes in a light signal monitored at a known radius. The cuvet photocentrifuge can only be run in the homogeneous mode whereas the disc photocentrifuge may be run in either the homogeneous or the line-start mode. Some systems permit the coarse end of the distribution to be measured in a gravitational mode and the fine end in the centrifugal mode. The use of light to determine particle size distribution requires a calibration factor to be applied as the particle size approaches the wavelength of the light, due to the inapplicability of the laws of geometric optics.

AUSTRALIAN STANDARD

## **Determination of particle size distribution by centrifugal liquid sedimentation methods**

Part 2:

Photocentrifuge method

**WARNING — This part of ISO 13318 may involve hazardous materials, operations and equipment. This part of ISO 13318 does not purport to address all of 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 determine the applicability of the regulatory limitations prior to its use.**

### **1 Scope**

This part of ISO 13318 covers methods for determining the particle size distribution of particulate materials by means of centrifugal sedimentation in a liquid. Solids concentrations are determined by the transmission of a light beam. The resulting signal enables conversion to a particle size distribution.

The method of determining the particle size distribution described in this part of ISO 13318 is applicable to powders that can be dispersed in liquids, powders that are present in slurry form and some emulsions. Typical particle size range for analysis is from about 0,1  $\mu\text{m}$  to 5  $\mu\text{m}$ . The method is applicable to powders in which all particles have the same density and comparable shapes and do not undergo chemical or physical change in the suspension liquid. It is usually necessary that the particles have a density higher than that of the liquid.

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

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