INTERNATIONAL STANDARD

ISO 13318-2

Second edition
2007-09-15

Determination of particle size distribution by centrifugal liquid sedimentation methods —

Part 2: Photocentrifuge method

Détermination de la distribution granulométrique par les méthodes de sédimentation centrifuge dans un liquide —

Partie 2: Méthode photocentrifuge

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO 13318-2 was prepared by Technical Committee ISO/TC 24, *Sieves, sieving and other sizing methods*, Subcommittee SC 4, *Sizing by methods other than sieving*.

This second edition cancels and replaces ISO 13318-2:2001, of which it constitutes a minor revision, due to the extension of Clause 4 and 5.2, and the addition of Figure 3 and the Bibliography.

ISO 13318 consists of the following parts, under the general title *Determination of particle size distribution by centrifugal liquid sedimentation methods*:

— *Part 1: General principles and guidelines*

— *Part 2: Photocentrifuge method*

— *Part 3: Centrifugal X-ray method*

Introduction

The sample suspension in a photocentrifuge may be contained in a cuvette or a disc. Sample concentration is determined by changes in a light signal monitored at a known radius. The cuvette 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.

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 µm to 5 µm. 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 referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

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*

3 Terms, definitions and symbols

For the purposes of this document, the terms, definitions and symbols given in ISO 13318-1, and the following symbols, apply.

D	optical density
E_i	extinction coefficient for a particle of diameter x_i
F(surface)	frequency undersize by surface
G	constant dependent upon the geometry of the system, the dimensions of the light beam and on the shape of the particles