

# INTERNATIONAL STANDARD

**ISO**  
**10076**

First edition  
1991-12-15

---

---

## **Metallic powders — Determination of particle size distribution by gravitational sedimentation in a liquid and attenuation measurement**

*Poudres métalliques — Détermination de la distribution granulométrique  
par sédimentation par gravité dans un liquide et mesure de l'atténuation*



Reference number  
ISO 10076:1991(E)

## **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.

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.

International Standard ISO 10076 was prepared by Technical Committee ISO/TC 119, *Powder metallurgy*.

Annexes A, B and C of this International Standard are for information only.

© ISO 1991

All rights reserved. No part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from the publisher.

International Organization for Standardization  
Case Postale 56 • CH-1211 Genève 20 • Switzerland

Printed in Switzerland

## Introduction

The settling behaviour under gravity of a given mass of particles dispersed in an initially static liquid is the basis of widely used sedimentation techniques for particle-size determination. The particle size is determined from the settling velocity by the use of Stokes' equation. The particle diameter so determined, the Stokes diameter, is the diameter of a sphere having the same density and the same free-fall velocity as the particle in a fluid of a given density and viscosity. The particle concentration must be low so that interaction between particles is negligible, and the Reynolds number must be low so that laminar flow conditions prevail.

Monitoring of the concentration of particles at a known depth below the surface of an initially homogeneous suspension enables the particle-size distribution to be calculated as a function of the measured surface or mass.

In this International Standard, two attenuation methods for the determination of concentration are considered:

- absorption of a beam of light;
- absorption of a beam of X-rays.

Although they are indirect, these sedimentation-attenuation methods are frequently employed in powder metallurgy. They give reproducible results as long as precise conditions of preparation of the suspension and of measurement are followed.