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# International Standard



# 4497

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INTERNATIONAL ORGANIZATION FOR STANDARDIZATION • МЕЖДУНАРОДНАЯ ОРГАНИЗАЦИЯ ПО СТАНДАРТИЗАЦИИ • ORGANISATION INTERNATIONALE DE NORMALISATION

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## **Metallic powders — Determination of particle size by dry sieving**

*Poudres métalliques — Détermination de la granulométrie par tamisage à sec*

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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 developing International Standards is carried out through ISO technical committees. Every member body interested in a subject for which a technical committee has been authorized 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.

Draft International Standards adopted by the technical committees are circulated to the member bodies for approval before their acceptance as International Standards by the ISO Council.

International Standard ISO 4497 was developed by Technical Committee ISO/TC 119, *Powder metallurgy*, and was circulated to the member bodies in August 1982.

It has been approved by the member bodies of the following countries :

Canada	Italy	Spain
China	Mexico	Sweden
Czechoslovakia	Norway	United Kingdom
Egypt, Arab Rep. of	Poland	USA
France	Romania	USSR
Germany, F. R.	South Africa, Rep. of	

No member body expressed disapproval of the document.

# Metallic powders — Determination of particle size by dry sieving

## 1 Scope and field of application

This International Standard specifies a method of determining the particle size distribution of metallic powders by dry sieving into size fractions.

The method is applicable to dry, unlubricated metallic powders, but not applicable to powders in which the morphology differs markedly from being equiaxial, for example flake-type powders.

The method is not applicable to metallic powders having a particle size wholly or mostly under 45  $\mu\text{m}$ .

## 2 References

ISO 565, *Test sieves — Woven metal wire cloth, perforated plate and electroformed sheet — Nominal sizes of openings*.

ISO 2591, *Test sieving*.

## 3 Principle

Separation of the metallic powder into particle size fractions by shaking through a set of wire cloth test sieves arranged in consecutive order of size of aperture openings.

Weighing of the fractions retained on each sieve and the fraction passing the finest sieve.

## 4 Apparatus

**4.1 Calibrated series of non-magnetic wire cloth sieves**, having different nominal aperture sizes. Each sieve cloth shall be mounted in a non-magnetic metal frame having a nominal diameter of 200 mm and a nominal depth within the range 25 mm to 50 mm.

NOTE — ISO 2591 specifies a nominal depth of 50 mm.

The test sieve frames shall nest snugly with one another, and the set shall be completed with a lid on top and a collecting pan below the bottom sieve.

The calibration of sieves shall be carried out according to ISO 2591, sub-clause 3.1.3.

The aperture size of the test sieves shall be chosen from the principal size (R 20/3) sieves of ISO 565, but if this is not appropriate the principal sizes can be partly or totally replaced from one of the intermediate sizes (R 40/3 or R 20). The aperture sizes of the test sieves shall be chosen so as to determine adequately the particle size distribution of the test portion (see clause 7).

NOTE — An irregular or partial set of test sieves may be selected, if agreed between the supplier and the purchaser.

**4.2 Mechanical sieving machine**, if used (see 6.2).

**4.3 Balance**, capable of weighing at least 100 g to an accuracy of  $\pm 0,05$  g.

**4.4 Soft brush**.

## 5 Preparation of test portion

**5.1** In general, the powder shall be tested in the as-received condition. If necessary, the powder may be dried. However, if the powder is susceptible to oxidation, the drying shall take place in vacuum or an inert gas.

**5.2** The test portion shall have a mass of approximately 100 g for powders having an apparent density greater than 1,50 g/cm<sup>3</sup>. If the apparent density of the powder is 1,50 g/cm<sup>3</sup> or less, the mass of the test portion shall be approximately 50 g.

## 6 Procedure

**6.1** The series of test sieves selected shall be assembled complete with lid and collecting pan in consecutive order of size of apertures, with the sieve having the largest aperture on top. The test portion shall be placed on the top sieve and this should be closed by a lid.

**6.2** The sieving shall be performed either by hand or by means of a mechanical sieving machine.

NOTE — As different types of sieving machines are known to give different results when using the same sieves and the same powder, it is generally possible to establish a correlation between different machines for a particular powder.