

**Metallpulbrid. Näivtiheduse määramine. Osa 2:
Scotti voluminomeetriline meetod**

Metallic powders - Determination of apparent
density - Part 2: Scott volumeter method

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

Käesolev Eesti standard EVS-EN 23923-2:2000 sisaldab Euroopa standardi EN 23923-2:1993 ingliskeelset teksti.

Standard on kinnitatud Eesti Standardikeskuse 11.01.2000 käskkirjaga ja jõustub sellekohase teate avaldamisel EVS Teatajas.

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This Estonian standard EVS-EN 23923-2:2000 consists of the English text of the European standard EN 23923-2:1993.

This standard is ratified with the order of Estonian Centre for Standardisation dated 11.01.2000 and is endorsed with the notification published in the official bulletin of the Estonian national standardisation organisation.

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ICS 77.160

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EUROPEAN STANDARD

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Descriptors: Powder metallurgy, metallic powder, measurements, bulk density

English version

**Metallic powders - Determination of apparent
density - Part 2: Scott volumeter method
(ISO 3923-2:1981)**

Poudres métalliques - Détermination de la masse
volumique apparente - Partie 2: Méthode du
volumètre de Scott (ISO 3923-2:1981)

Metallpulver - Ermittlung der Füllichte - Teil
2: Scott-Volumeter-Verfahren (ISO 3923-2:1981)

This European Standard was approved by CEN on 1993-04-02. CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CEN member.

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CEN

European Committee for Standardization
Comité Européen de Normalisation
Europäisches Komitee für Normung

Central Secretariat: rue de Stassart, 36 B-1050 Brussels

Foreword

In 1992 ISO 3923-2:1981 "Metallic powders - Determination of apparent density - Part 2: Scott volumeter method" was submitted to the CEN Primary Questionnaire procedure.

Following the positive result of the CEN/CS Proposal ISO 3923-2:1981 was submitted to the CEN Formal Vote. The result of the Formal Vote was positive.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by October 1993, and conflicting national standards shall be withdrawn at the latest by October 1993.

According to the Internal Regulations of CEN/CENELEC, the following countries are bound to implement this European Standard :

Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

Endorsement notice

The text of the International Standard ISO 3923-2:1981 was approved by CEN as a European Standard without any modification.

NOTE: The European references to international publications are given in annex ZA (normative).

Annex ZA (normative)
Normative references to international publications
with their relevant European publications

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies (including amendments).

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
ISO 3923-1		Metallic powders - Determination of apparent density - Part 1: Funnel method	EN 23923-1	
ISO 3923-3		Metallic powders - Determination of apparent density - Part 3: Oscillating funnel method	EN 23923-3	

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International Standard



3923/2

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

**Metallic powders — Determination of apparent density —
Part 2 : Scott volumeter method**

Poudres métalliques — Détermination de la masse volumique apparente — Partie 2 : Méthode du volumètre de Scott

First edition — 1981-09-01

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Descriptors : pulverulent products, metallic powder, tests, determination, density (mass/volume), funnels, sampling, volumetric analysis.

Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards institutes (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 set up 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 3923/2 was developed by Technical Committee ISO/TC 119, *Powder metallurgy*, and was circulated to the member bodies in December 1979.

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

Austria	Germany, F. R.	Romania
Bulgaria	India	South Africa, Rep. of
Canada	Italy	Spain
China	Japan	Sweden
Czechoslovakia	Korea, Rep. of	United Kingdom
Egypt, Arab Rep. of	Norway	USA
France	Portugal	USSR

No member body expressed disapproval of the document.

Metallic powders — Determination of apparent density — Part 2 : Scott volumeter method

1 Scope and field of application

This part of ISO 3923 specifies the Scott volumeter method for the determination of the apparent density of metallic powders. It is applicable to powders that will not flow freely through a 5 mm orifice (see ISO 3923/1).

Part 3 of this International Standard specifies the oscillating funnel method for the determination of apparent density of such powders, and this is preferred since it gives better precision, but it cannot be used in cases where the powder may change its properties due to the vibration action applied to the powder during testing.

2 References

ISO 3923/1, *Metallic powders — Determination of apparent density — Part 1 : Funnel method.*

ISO 3923/3, *Metallic powders — Determination of apparent density — Part 3 : Oscillating funnel method.*

3 Principle

Measurement of the mass of a certain quantity of powder which in a loose condition exactly fills a cup of known volume.

The loose condition is obtained, when filling the cup, by cascading the powder over a series of inclined plates in a Scott volumeter (see figures 1 and 2).

The ratio between the mass and the volume represents the apparent density.

4 Symbols and designations

Symbol	Designation	Unit
ρ_a	Apparent density of metallic powders (general term)	g/cm ³
ρ_{as}	Apparent density obtained by the Scott volumeter method	g/cm ³
m	Mass of the powder	g
V	Volume of the cup	cm ³

5 Apparatus

5.1 Scott volumeter, comprising :

5.1.1 Funnel, having a large and a small conical section separated by a cylindrical section and incorporating a brass sieve of aperture size 1,18 mm.

5.1.2 Baffle box, having a square section, and containing four glass baffles which may be located and retained by grooves in opposite sides of the box and may thus be removed for ease of cleaning. The baffles are arranged so that the powder falls on to each of them in turn, thereby breaking the fall and reducing the velocity of the stream of powder. It is important that none of the powder can pass between the upper edge of the glass baffles and the sides of the baffle box. It is also important that the lower edges of the glass baffles are either in line or slightly overlap in a vertical plane.

A typical design of Scott volumeter is shown in figures 1 and 2. Dimensions given with tolerances are mandatory. The other dimensions represent those most frequently used and may vary slightly, provided that the principle requirements previously mentioned are maintained.

5.1.3 Stand and horizontal vibration-free base, to support the cup, box and funnel coaxially at the heights indicated in the figures.

5.2 Cylindrical cup, having a capacity of $25 \pm 0,05$ cm³ and an internal diameter of 30 ± 1 mm.

NOTE — The cup and funnels should be made of non-magnetic, corrosion-resistant metallic material having sufficient wall thickness and hardness to avoid distortion and excessive wear. The inner surfaces of the cup and funnels should be polished.

5.3 Balance, of sufficient capacity, permitting weighing to an accuracy of $\pm 0,05$ g.

6 Sampling

6.1 The test sample shall be of at least 100 cm³ volume to allow the determination to be carried out on three test portions.