

ICS 77.160
CCS H 16



**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

GB/T 1479.2-2011

**Metallic powders -- Determination of apparent density -- Part 2:
Scott volumetric method
(English Translation)**

Issued on: May 12, 2011

Implemented on: February 1, 2012

**Issued by: General Administration of Quality Supervision, Inspection and
Quarantine of PRC**

Table of Contents

Foreword...	3
1 Scope...	5
2 Normative references...	5
3 Principles...	5
4 Symbols and definitions...	5
5 Instruments...	6
6 Sampling...	6
7 Steps...	7
8 Presentation of results...	7
9 Test report...	7

1 Scope

This part of GB/T 1479 specifies the method for measuring the apparent density of powders with a Scott volumeter. This part applies to powders that cannot flow freely through a funnel with a pore diameter of 5.0 mm (see GB/T 1479.1).

2 Normative references

The following documents are essential to the application of this document. For the dated referenced documents, only the versions with the indicated dates are applicable to this document; for the undated referenced documents, only the latest versions (including all the amendments) are applicable to this document.

GB/T 1479.1 Metallic powders - Determination of apparent density - Part 1: Funnel method (ISO 3923-1:2008, IDT)

3 Principles

This part describes the measurement of the mass of the powder that in a loose condition completely fills a measuring cup with a known volume. The powder fills the measuring cup after it passes through a series of inclined baffles in the Scott volumeter, so that the powder is in a loose condition (see Figures 1 and 2). The apparent density is expressed as the ratio of mass to volume.

4 Symbols and definitions

The symbols and definitions are shown in Table 1.

5.1.1 Funnels

It is assembled from two conical funnels, large and small, and a brass sieve with a pore diameter of 1.18 mm is placed between them.

5.1.2 Baffle box

The baffle box has a square section, and there are four glass baffles inside, which are fixed on the sides of the box by means of grooves and can be easily removed for cleaning. The purpose of installing the baffles is to make the powder fall on each baffle in turn, thereby breaking the fall and slowing down the velocity of the flow of powder.

It is important that no powder can pass between the upper edge of the glass baffles and the sides of the box, and that the lower edges of these glass baffles shall be in line or slightly overlap when viewed in a vertical plane.

A typical Scott volumeter is shown in Figures 1 and 2. Dimensions with tolerances are mandatory; other dimensions are the dimensions used in most cases and can be slightly changed, provided that the requirements mentioned above shall be met.

5.1.3 Stand and horizontal, vibration-free base

The stand and the horizontal non-vibration base are used to support the measuring cup, the baffle box, and funnels, which are fixed concentrically according to the dimensions given in Figures 1 and 2.

5.2 Measuring cup

The volume is $25 \text{ cm}^3 \pm 0.05 \text{ cm}^3$, and the inner diameter is $30 \text{ mm} \pm 1 \text{ mm}$.

NOTE: The cup and funnels shall be made of non-magnetic, corrosion-resistant metal materials with sufficient wall thickness and hardness to avoid deformation and excessive wear, and the inner surfaces of the cup and funnels shall be polished.

5.3 Balance

The balance shall have sufficient range, and the weighing accuracy shall be $\pm 0.05 \text{ g}$.

6 Sampling

6.1

When measuring the apparent density of each metal powder, a sample with a volume of at least 100 cm³ shall be taken, and it is allowed to be divided into three parts for measurement.

6.2

Normally, metal powders are determined in the as-received condition. In some cases, metal powders shall be dried. However, if the powder is easy to oxidize, it shall be dried under the protection of a vacuum or inert atmosphere. If the metal powder contains volatile substances, drying is not allowed.

7 Steps

7.1

Put the powder on the sieve of the funnel with a spoon; the powder passes through the baffle box and flows into the measuring cup until the cup is filled and the powder overflows.

7.2

If the powder cannot pass through the sieve freely, brush the metal powder lightly with a soft brush to help it to pass through the sieve.

NOTE: If light brushing is invalid, then the metal powder is not suitable for the determination of apparent density by the Scott volumeter method.

7.3

After the powder overflows from the measuring cup, level it with a stainless-steel straight edge. However, do not compress or pull out the powder in the cup, and do not shake or vibrate the cup.

7.4

After leveling, tap the cup lightly to settle the powder, so as to avoid spilling the powder during the movement, and there shall be no powder sticking to the external surface of the cup.

7.5

Weigh the metal powder in the cup, accurate to 0.05 g. Determinations are carried out on three test portions.

8 Presentation of results

The apparent density is calculated by the following formula:

Take the arithmetic mean of the three determination results as the final result, accurate to 0.01 g/cm³. When the difference between the three determination results exceeds 1% of

the mean, the maximum and minimum values shall also be reported with the final result.

9 Test report

The test report shall include the following contents:

.....