

ICS 77.160
CCS H 16



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

GB/T 1479.1-2011

**Metallic powders -- Determination of apparent density -- Part 1:
Funnel 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**

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1 Scope

This part of GB/T 1479 specifies the method for measuring the apparent density of metal powders with a funnel under standard conditions.

This part applies to metal powders that can flow freely through a funnel with a pore diameter of 2.5 mm. If the powder is difficult to pass through a pore with a diameter of 2.5 mm but can flow freely through a 5.0 mm pore, this method can also be used.

Part 2 of this standard (see GB/T 1479.2) specifies the apparent density measuring method for powders that cannot pass through a 5.0 mm pore.

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 1479.2 Metallic powders - Determination of apparent density - Part 2: Scott volumeter method (ISO 3923-2:1981, 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 funnel is placed at a certain distance above the measuring cup, and the powder falls freely from the funnel into the measuring cup to obtain the loose state.

4 Symbols and definitions

The symbols and definitions involved in this standard are shown in Table 1.

powder 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 powder contains volatile substances, drying is not allowed.

7 Steps

7.1

Pour the powder into a funnel with a pore diameter of 2.5 mm and let the powder flow directly into the measuring cup from the small hole until the measuring cup is completely filled and the powder overflows. Level the powder with a non-magnetic straight edge, but do not compress the powder, and take care not to shake and vibrate the measuring cup.

7.2

If the powder cannot flow through the funnel, a funnel with the 5 mm pore shall be selected. If the powder still cannot flow through, it is allowed to poke the powder once from the top of the funnel with a metal wire with a diameter of 1 mm; however, take care that the metal wire cannot enter into the measuring cup.

7.3

After leveling the powder, tap the measuring cup to settle the powder, so as to avoid the powder overflowing during the movement and ensure that there is no powder sticking to the external surface of the cup.

7.4

Measure the mass of the powder, and the result shall be accurate to 0.01 g.

7.5

Take the arithmetic mean of three determination results as the final result.

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.

9.1 Repeatability

The same operator carries out two determinations with the same instrument and the same batch of powder; if at a 95% confidence level, the difference between the two determination results exceeds 0.03 g/cm³, the results are not credible.

9.2 Reproducibility

The same batch of powder is tested in two different laboratories; if at a 95% confidence level, the difference between the determination results exceeds 0.05 g/cm³, the results are not credible.

10 Inspection report

The inspection report shall include the following contents:

- a) the standard number;
- b) the detailed description required for the qualification of the sample;
- c) If the powder is dried, the drying process shall be indicated;
- d) The nominal size of the pore diameter shall be indicated; if a metal wire is used, it shall be indicated;
- e) the results obtained;
- f) all other operations that are not specified in this part or optional;
- g) any factors that may have affected the results.

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