

ICS 77.160



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

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**Metallic powders - Determination of particle size by dry sieving
(English Translation)**

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1 Scope

This Document describes a method for determining the particle size distribution of metal powders using dry sieving.

This Document applies to dry, lubricant-free metal powders.

This Document does not apply to metal powders with significantly asymmetrical shapes (e.g., flake-like) or metal powders with all or most of their particles smaller than 45 µm.

2 Normative References

The provisions in following documents become the essential provisions of this Document through reference in this Document. For the dated documents, only the versions with the dates indicated are applicable to this Document; for the undated documents, only the latest version (including all the amendments) is applicable to this Document.

ISO 565 Test sieves - Metal wire cloth, perforated metal plate and electroformed sheet -

Nominal sizes of openings

NOTE: GB/T 6005-2008 Test sieves - Metal wire cloth perforated metal plate and electroformed sheet - Nominal sizes of openings (ISO 565:1990, MOD)

ISO 2591-1 Test sieving - Part 1. Methods using test sieves of woven wire cloth and perforated metal plate

ISO 3310-1 Test sieves - Technical requirements and testing - Part 1. Test sieves of metal wire cloth

NOTE: GB/T 6003.1-2022 Test sieves - Technical requirements and testing - Part 1. Test sieves of metal wire cloth (ISO 3310-1:2016, MOD)

3 Terms and Definitions

For the purposes of this Document, there are no terms and definitions apply.

4 Principle

A set of test sieves, arranged sequentially according to sieve aperture size, is used to separate metal powder into different particle sizes by vibration. The amount of powder component on each sieve layer and on the base plate is weighed.

5.1 Calibration sieve sets

The test sieves with calibrated non-magnetic metal wire mesh have different nominal apertures.

Each sieve shall be mounted on a non-magnetic metal sieve frame with a nominal diameter of

200 mm and a nominal depth of 25 mm to 50 mm.

NOTE: The nominal depth specified in ISO 3310-1 is 50 mm or 25 mm.

The test sieve consists of a sieve frame that fits snugly together with a top cover, and a base plate beneath the bottom sieve. Calibration of the test sieves shall be performed according to the relevant requirements in ISO 3310-1.

The aperture size of the test sieve shall be selected from the main size series (R20/3) in ISO

565. If this is not suitable, it may be partially or entirely replaced by one of the supplementary size series (R40/3 or R20). The selection of the test sieve aperture size shall ensure the particle size distribution of the sample under test (see Clause 8).

If mechanical sieving is used, see 7.1.

5.2 Balance

The balance shall have a range greater than 100 g, accurate to ± 0.05 g.

5.3 Soft-bristled brush

There are no special requirements for the soft-bristled brush.

6.1 General requirements

Powders are usually tested in their received state. If necessary, the powder may be dried; if the powder is easily oxidized, it shall be dried under a vacuum or inert atmosphere.

6.2 Amount of test materials

For powders with a loose bulk density greater than 1.50 g/cm^3 , the amount of test materials is approximately 100 g; for powders with a loose bulk density no greater than 1.50 g/cm^3 , the amount of test materials is approximately 50 g.

7.1 General requirements

The selected set of test sieves shall be fitted together with the sieve frame and base in order of aperture size, with the largest aperture at the top of the sieve. The test materials shall be placed inside the top sieve and the lid tightly closed.

Sieving shall be done manually or using a mechanical sieving machine.

NOTE 1: Under the conditions of identical sieves and powders, different types of sieving machines shall yield different results. Therefore, for a specific powder, the correspondence between different sieving machines can usually be determined.

If agreed upon by both the supplier and the purchaser, one or more sets of sieves with different sieve frame diameters shall be selected.

For sieve frames with diameters other than 200 mm, the amount of test materials should be adapted to the sieve area. The minimum amount of test materials should be 10 g.

NOTE 2: The precision report in Clause 9 is based on a 200 mm sieve frame diameter and a 100 g amount of test materials. The precision report is invalid for sieve frames with diameters other than 200 mm and amount of test materials other than 100 g.

7.2 Sieving time

The sieving process shall continue until the end of the sieving process, or until a time agreed upon by both the supplier and the purchaser. According to the provisions of ISO 2591-1, the sieving endpoint is reached when the number of test materials passing through the sieve of the largest component per minute is less than 0.1% of the amount of test materials.

7.3 Measurement

After sieving, weigh the powder on each sieve and in the base plate. When using a 100 g of test material, weigh to an accuracy of 0.1 g; when using a 50 g of test material, weigh to an accuracy of 0.05 g. Collect the powder from each sieve for weighing, following the order of the coarsest component to the component on the weighing base plate.

Remove one sieve from the sieve set and gently pour the powder off to one side, transferring it to a clean sheet of paper with a soft-bristled brush. Then, brush any powder adhering to the bottom of the sieve and frame onto the next finer sieve. Next, invert the sieve onto the clean

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