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**Powders for powder metallurgical purposes -- Sampling
(English Translation)**

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Table of Contents

Foreword...	3
1 Scope...	4
2 Terms and definitions...	4
3 Number of increments...	5
4 Sampling...	6

1 Scope

This Standard specifies the method for sampling powders for powder metallurgical purposes and dividing the sample into the required quantity for testing.

2 Terms and definitions

For the purposes of this document, the following terms and definitions apply (see Figure

1).

2.1

lot

The quantity of powder produced or processed under the same conditions.

2.2

increment

The powder obtained once from one lot of powder using a sampling device.

2.3

gross sample

The composition of all the increments taken from one lot of powder, which shall be sufficient for the test.

2.4

composite sample

The whole or part of a mixed gross sample.

Note 1: It may be obtained by splitting the lot.

Note 2: Must be thoroughly blended.

2.5

test sample

Powder taken out from the composite sample in order to measure a certain property or prepare a test piece.

Note: Usually obtained by reducing a composite sample.

2.5.1

test portion

A quantity of powder taken from the test sample (or from the composite sample if the test sample is the same as the composite sample) for testing.

2.5.2

test piece (test specimen)

An object of a specified shape made from a test sample.

3.1 Sampling during continuous flow

If the entire lot of powder is discharged continuously through a single opening, samples can be taken as the lot is discharged. At this time, increments shall be taken at regular intervals during the entire discharging period. The number of increments depends on the degree of precision required. At least three increments shall be taken, one at the start of discharging, one during the discharging process, and one before the end of discharging.

3.2 Sampling from powder in container

Unless otherwise agreed, when samples are taken from the lots of powders in containers, they shall be taken randomly as specified in Table 1. From each container drawn out, take one or more additional increments to make up the gross sample. If one lot contains containers containing different quantities of powder, the containers selected shall be representative of the lot and the number of increments taken from each selected container shall be proportional to the amount of powder in the container.

4.1 General provisions

The composite sample composed of the increments shall represent the lot of powder as accurately as possible. All surfaces of the sampler that come into contact with the powder shall be smooth and clean.

Note: When one lot of powders is in motion, such as during loading, unloading, transportation and storage, the container will be vibrated, and uneven blending may occur at any time.

4.2 Sampling process

4.2.3.2

The sampler shown in Figure 2 is only applicable to the loose powders with good fluidity. The sampler comprises an inner tube and an outer tube, the bottom of which is closed, and longitudinal long holes are opened at appropriate longitudinal positions of the inner tube and the outer tube. When the inner and outer tubes rotate, the holes can be opened and closed smoothly. In order to prevent the inner and outer tubes from being blocked by large particles of powder during rotation, there shall be an appropriate gap between the inner and outer tubes.

When taking samples with this sampler, first close the long hole and then insert it into the bottom of the container. When sampling during transportation and storage, it is recommended that the sampler shall be inserted in a vertical direction. When the sampler is inserted to the bottom, open the long hole so that the powder can fill the sampler from bottom to top, then close the long hole and pull out the sampler. Pour all powder from the sampler into the gross sample container.

If the depth of the powder is greater than the length of the sampler, multiple increments shall be taken so that increments are obtained at each depth. The number of increments is a multiple of the ratio of the powder depth to the length of the sampler.

4.2.3.3

Another type of sampler consists of a single-layer tube with an open end. When the sampler is pulled out of the powder, the powder remains in the tube. This sampler can be realized by selecting the appropriate tube diameter. This sampler, when used for taking samples, shall be slowly inserted into the bottom of the container. When sampling during transportation and storage, it is recommended that the sampler shall be inserted vertically to the bottom, then pulled out and all the powder in the sampler shall be poured into the gross sample container.

4.2.3.4 If powder stratification occurs in the direction of sampler insertion, the amount

taken out from each layer will be unequal, resulting in errors. To reduce the effect of powder stratification perpendicular to the sampler insertion direction, the distribution of the sampler insertion points shall be as representative as possible.

If several increments are taken from a cylindrical container, the number of increments taken at each interval on its axis shall be proportional to the distance between them. If only one increment is to be sampled from a cylindrical container and the powder in the container is introduced from an opening above its axis, the sampler shall be inserted at a position 0.7 times the radius from the centre. If the powder in the container is not filled from an opening

above its axis and the container is not cylindrical, samples shall be taken from representative positions.

4.2.3.5 The gross sample obtained shall be rotated at a speed of 15 r/min ~ 30 r/min for 10 ~ 15 turns to obtain a composite sample.

4.2.4 Sampling by dividing the entire lot of samples

The equipment and method described in 4.3 can be used to take the sample division of the entire lot of powder, which is usually suitable for small lots of powder.

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