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**NATIONAL STANDARD OF THE
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Powders -- Determination of tap density

粉末产品 振实密度测定通用方法

(English Translation)

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1 Scope

This standard specifies the method for measuring the tap density, that is, the powder in the container is tapped under certain conditions.

2 Principle

Use a tapping apparatus to tap the specified amount of powder in the container until the volume of the powder cannot be further decreased. The mass of the powder divided by the volume is the tap density.

It can also be tapped by hand.

3 Symbol

See Table 1.

4.1 Balance

The weighing range and accuracy shall meet the requirements of Table 2.

4.2 Glass measuring cylinder

4.2.1

The calibrated volume is 100cm

; the height of the scale area is about

175mm; the sub-scale is 1cm

; and the measurement accuracy can reach

$\pm 0.5\text{cm}$

4.2.2

The calibrated volume is 25 cm

; the height of the scale area is about 135 mm; and the sub-scale is 0.2 cm

4.2.3 The measuring cylinder with a calibrated volume of 25 cm

3 is mainly used for products of which the tap density is higher than 4g/cm

. It can also be used when the tap density of the powder is lower.

4.3 Tapping apparatus

The bottom of the apparatus is required to be strong and able to withstand the tapping of the measuring cylinder. Tapping shall be carried out under sealed conditions to avoid any loosening of the surface layer. The stroke shall be 3mm;

and the tapping frequency is between 100 times/min and 300 times/min. The tapping apparatus is shown in Figure 1.

It may also use a manual method: use a thick rubber pad (the size is about 100mm x 100mm x 5mm).

6 Analysis steps

6.1

cleaning

Use a brush to clean the glass measuring cylinder (4.2); or use a solvent (such as acetone) if necessary. If a solvent is used, then, the measuring cylinder must be thoroughly cleaned before each use. It must be dried before use.

6.2 Weighing

Weigh the sample with the balance (4.1) according to the sampling amount specified in Table 2, accurate to 0.1g.

6.3 Determination

Place the sample in the measuring cylinder. Please note that the sample shall be flat. Place the measuring cylinder on the tapping apparatus (4.3) and tap the measuring cylinder until the sample volume is not further decreased

1)

It is also allowed to use the following tapping method: Hold the measuring cylinder by hand and tap on the thick rubber pad (4.3) until the sample volume is not further decreased.

Before the end of this process, the tapping shall be light, so as to avoid loosening of the sample surface

2)

6.4 Reading

Read the volume-value of the surface that has reached the flat-level after tapping. If the surface is uneven, read the average value of the highest point and the lowest point of the surface after tapping, as the tapping volume-value.

When using a 100 cm

3 measuring cylinder, the final volume-value read is close to 0.5 cm

. If a 25 cm

3 measuring cylinder is used, the final volume-value is close to 0.2 cm

1)

In the actual process, the minimum number of times that the volume does not change shall be determined. For all tests of the same-kind of powder, the measuring cylinder must go through more than

2N times of tapping -- unless the experience shows that, under the specified number of times (not less than N) tapping, the result is reliable and satisfactory. For fine metal powder, it has been found that

3,000 times of tapping can meet the requirements for all particle-sizes.

2)

In general, both mechanical and manual methods can achieve parallel results. However, for powders with very-low tap density or very-fine powders, the two results obtained in this way are significantly different.