NATIONAL STANDARD OF THE

PEOPLE'S REPUBLIC OF CHINA

GB/T 5162-2021

Metallic powders - Determination of tap density

Issued on: March 9, 2021 **Implemented on: October 1, 2021**

Issued by: SAMR; SAC

Table of Contents

Foreword

This document was drafted in accordance with the rules of GB/T 1.1-2020 Directives for Standardization - Part 1: Rules for the Structure and Drafting of Standardizing Documents.

This document serves as a replacement of GB/T 5162-2006 Metallic Powders - Determination

of Tap Density. In comparison with GB/T 5162-2006, apart from structural adjustments and editorial modifications, the main technical changes are as follows:

a) The Scope is modified (see Chapter 1; Chapter 1 of Version 2006);

b) "Upon negotiation and agreement, tapping can also adopt the mode of manual operation" is deleted (see Chapter 2 of Version 2006);

c) "It shall have an appropriate measuring range and accuracy to satisfy the requirements in Table 2" is modified into "It shall have an appropriate measuring range to satisfy the requirements in Table 2, and the measurement mass accuracy is 0.1 g" (see 4.1;

4.1 of Version 2006);

d) The previous Table 2 is deleted (see 4.1 of Version 2006);

e) "The measurement accuracy is ? 0.1 cm3" is deleted (see 4.2 of Version 2006);

f) The labeling mode of the schematic diagram of the tapping device in Figure 1 is

modified (see Figure 1; Figure 1 of Version 2006);

g) The requirements for the tapping device are modified into "the tapping device allows the graduated cylinder to be tapped on the anvil, and the tapping shall make the powder compact, and the surface layer shall not have any looseness" (see 4.3; 4.3 of Version 2006);

h) "The use of hard rubber boards (approximately 100 mm ? 100 mm ? 5 mm) and the tapping mode of manual operation is only allowed upon negotiation and agreement" is deleted (see 4.3 of Version 2006);

i) When using a 100 cm3 graduated glass cylinder for the test, the powder apparent density shall be "? 1" is modified into "1 ~ 4" (see Table 2; Table 3 of Version 2006);

j) "For each type, take 3 samples for the test" is modified into "if possible, 3 samples shall be taken for the test" (see 5.3; 5.3 of Version 2006);

k) "See Figure 1" is modified into "See NOTE" (see 6.3; 6.3 of Version 2006);

l) "Upon negotiation and agreement, tapping can also be carried out in the following modes" is deleted (see 6.3 of Version 2006);

Metallic Powders - Determination of Tap Density

1 Scope

This document specifies a method for the determination of tap density, that is, the density of a powder after it has been tapped in a container under specified conditions.

2 Principle

Put a certain amount of powder in the container and tap it through a tapping device, until the volume of the powder no longer decreases. The mass of the powder divided by the volume after tapping gives its tap density.

3 Symbols

The following symbols are applicable to this document, see Table 1.

4.1 Balance

The balance shall have an appropriate measuring range to satisfy the requirements of Table 2,

and the measurement accuracy of mass is 0.1 g.

4.2 Graduated Glass Cylinder

The volume of the calibrated graduated glass cylinder is 100 cm3, and the height of the

graduated portion is approximately 175 mm. The graduations shall be at an interval of 1 cm3

and the measurement accuracy is ? 0.5 cm3.

The volume of the calibrated graduated glass cylinder is 25 cm3, and the height of the graduated

portion is approximately 135 mm. The graduations shall be at an interval of 0.2 cm3.

The 25 cm3 cylinder is mainly used to measure powder with an apparent density greater than 4

g/cm3, especially metal powders that are difficult to melt, but it may also be used for powder

with a relatively low apparent density.

5---cam.

a Height of stroke.

Figure 1 -- Schematic Diagram of Tapping Device

5.2 Generally, powder is tested in accordance with the receiving status. Under certain

circumstances, dry powder is needed. If the powder is easily oxidized, drying shall be

performed in vacuum or inert gas. If the powder contains volatile substances, then, it cannot be

dried.

6 Test Procedures

6.1 Use a test tube brush to clean the inner wall of the graduated cylinder (4.2), if possible, it

can be cleaned with a solvent, for example, acetone solution. If a solvent is used, before use,

the graduated cylinder shall be completely dry.

6.2 Use the balance (4.1) to weigh the mass of the sample in accordance with the requirements

of Table 2, accurate to 0.1 g.

6.3 Put the sample into the graduated cylinder. Pay attention to keep the surface of the powder

in a horizontal state. Place the graduated cylinder on the tapping device (4.3), tap it, until the

volume of the powder no longer decreases (see NOTE).

NOTE: in practice, the minimum number N of tapping required so that the powder volume no

longer changes can be determined. For the same type of powders, except for the specific

.....