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

GB/T 5159-2025

Replacing GB/T 5159-2015

**Metallic powders, excluding powders for hardmetals -
Determination of dimensional changes associated with
compacting and sintering**

金属粉末（不包括硬质合金用粉）与成型和烧结有联系的尺寸变化的测定方法
(English Translation)

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Foreword

This document complies with the provisions of GB/T 1.1-2020 "Standardization Work Guidelines Part 1: Structure and Drafting Rules of Standardization Documents".

Drafting.

This document replaces GB/T 5159-2015 "Dimensional Variations in Metal Powders (excluding cemented carbide powders) Related to Forming and Sintering".

The "Determination Methods" for [specific components] has undergone the following major technical changes compared to GB/T 5159-2015, in addition to structural adjustments and editorial modifications.

a) The structure, dimensions, and dimensional tolerances of the upper and lower die punches in Figure 1 were modified, and the dimensional tolerances of the upper and lower die punches in Figure 2 were modified (see 7.1, 2015).

(6.1 of the 2018 edition)

b) The precision of the balance was changed to 0.001g (see 7.3, 6.3 in the 2015 edition);

c) The precision of the "micrometer" has been changed to 0.005 mm (see 7.4, 6.4 in the 2015 edition);

d) Added "The test powder to be pressed shall be tested in the receiving state" (see 9.1).

This document is equivalent to ISO 4492:2017 "Metal powders (excluding powders for cemented carbide) - Dimensional variations in relation to forming and sintering".

Determination methods for chemical substances.

Please note that some content in this document may involve patents. The issuing organization of this document assumes no responsibility for identifying patents.

This document was proposed by the China Nonferrous Metals Industry Association.

This document is under the jurisdiction of the National Technical Committee on Standardization of Nonferrous Metals (SAC/TC243).

1 Scope

This document specifies the dimensional changes related to forming and sintering after sintering metal powder and reference powder under the same conditions.

Determination methods (see Chapter 4).

This document applies to the determination of three dimensional changes in metal powders (excluding cemented carbide powders) during the forming and sintering processes.

2 Normative references

The contents of the following documents, through normative references within the text, constitute essential provisions of this document. Dated citations are not included.

For references to documents, only the version corresponding to that date applies to this document; for undated references, the latest version (including all amendments) applies.

This document.

hardmetals - Tensile test pieces) Note. GB/T 7963-2015 Sintered metallic materials (excluding cemented carbides) - Tensile test specimens (ISO 2740:2009, IDT)

3 Terms and Definitions

This document does not contain any terms or definitions that need to be defined.

4 Principles

Metal powder, or metal powder mixed with lubricant, is pressed into a sample and sintered under specified conditions. The mold cavity dimensions and the pressed blank are measured.

Dimensions and/or post-sintering specimen dimensions, calculate the required dimensional changes. Differences between these different measurements are expressed as mold cavity dimensions.

Or, calculate the percentage of the compact size (see Chapter 9).

Standard samples made from reference batch powder and samples made from test powder were tested together to obtain the dimensional change values of the two powders (the latter being...).

This information can be found in Appendix A).

5 Test Parameters

The reference powder should be selected through consultation between the supplier and the buyer, and should have a composition and properties similar to the test powder.

This document covers the following three dimensional variations.

5.1

From mold cavity size to blank size (elastic aftereffect). The increase in blank size in the direction perpendicular to the pressing direction after the blank is removed from the mold.

5.2

From compact size to sintered size (sintered size change). The change in sample size caused by sintering.

5.3

From mold cavity size to sintering size (total size change).