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

GB/T 10425-2025

Replacing GB/T 10425-2002

**Sintered metal friction materials - Determination of apparent
hardness**

烧结金属摩擦材料 表观硬度的测定

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Foreword

This document is in accordance with the provisions of GB/T 1.1-2020 "Guidelines for standardization work Part 1: Structure and drafting rules for standardization documents" Drafting.

This document replaces GB/T 10425-2002 "Sintered metal friction materials - Determination of apparent hardness" and is consistent with GB/T 10425-2002.

In addition to structural adjustments and editorial changes, the main technical changes are as follows.

- a) Added the method for determining apparent Rockwell hardness and changed the scope of application (see Chapter 1, Chapter 1 of the 2002 edition);
- b) Added "Symbols and Instructions" (see Chapter 4);
- c) Added "Principles" (see Chapter 5);
- d) Changed "test equipment" to "instrument equipment" and added the hardness tester used for apparent Brinell hardness and apparent Rockwell hardness test and corresponding requirements for the pressure head (see Chapter 6, Chapter 3 of the 2002 edition);

e) Changed "Test specimen preparation" to "Sample" and deleted "For sintered metal friction plates with core plates, the friction layer thickness should be no less than the pressure 5 times the scar depth", adding specific requirements for sample preparation (see Chapter 7, 4.2 of the 2002 edition);

f) Changed "test method" to "test procedure", changed Table 1 and the test method content, and added the apparent Rockwell hardness test procedure Content (see Chapter 8, Chapter 5 of the 2002 edition);

g) "Test results" has been deleted (see Chapter 6 of the 2002 edition);

h) Added "Test Data Processing" (see Chapter 9);

i) Added "Precision and Bias" (see Chapter 10);

j) "Test report" has been changed (see Chapter 11, Chapter 7 of the 2002 edition).

Please note that some of the contents of this document may involve patents. The issuing organization of this document does not assume the responsibility for identifying patents.

This document is proposed and coordinated by the China Machinery Industry Federation.

This document was drafted by: Huangshi Saifu Friction Material Co., Ltd., Hangzhou Advance Gearbox Group Co., Ltd., Beijing Youcai Bermuda Aviation Equipment Co., Ltd., Shaanxi Yichuang Titanium Zirconium Testing Co., Ltd., and Northwest Research Institute of Nonferrous Metals.

The main drafters of this document are: Lü Bo, Xu Yao, Wang Xiufei, Xu Kun, Xu Chengfa, Zhang Lei, Li Aijun, and Tan Ping.

The previous versions of this document and the documents it replaces are as follows.

- First issued as GB/T 10425-1989 in 1989, first revised in 2002;
- This is the second revision.

Introduction

Sintered metal friction materials generally have a porous structure. Therefore, they can be understood as porous composite materials.

It contains both solid phase and some pores, so the test measures the apparent hardness of the material.

GB/T 10425-2002 only recommends a Brinell hardness test method for the apparent hardness of sintered metal friction materials.

With the continuous development of technology, new materials, new processes and new technologies have also put forward new requirements for the evaluation of the hardness of sintered metal friction materials.

Japan and other countries use the Rockwell hardness test method to test the apparent hardness of sintered metal friction materials.

The Brinell hardness test method uses the indentation diameter d to characterize the hardness value of the material. Its advantages are strong applicability, stable test data, and measurement accuracy.

The disadvantages are that the test operation time is long, the indentation measurement is also time-consuming, and the inspection of finished products and thin parts testing are more difficult.

The difference between the Rockwell hardness test method and the indentation test method is that the depth of the indentation is measured instead of the diameter of the indentation. The depth value h is used to characterize the material.

The hardness index of the material is simple, quick and efficient to operate; because the test force used is small, the indentation produced is smaller than that of the Brinell hardness test.

The indentation is small, so there is no obvious damage to the surface of the product.

The industry standard of metal friction materials is in line with international standards. At the same time, the revision of this document also provides a platform for domestic and international companies to conduct technical exchanges and cooperation.

It provides a common foundation and language for cooperation and can promote the international development of the industry.

This document specifies that a carbide spherical indenter should be used to determine the Brinell hardness. The Brinell hardness symbol is HBW to avoid confusion with the old symbol.

HB is confused with the symbol HBS used when using a steel ball indenter; the apparent Rockwell hardness spherical indenter is specified to be a cemented carbide spherical indenter.

The head, because the tendency of the steel ball to become flat as it is used will lead to increased errors in the measurement of hardness values.

1 Scope

This document specifies the apparent Brinell hardness and apparent Rockwell hardness of sintered metal friction materials (Rockwell hardness and scale L, M, R).

Method for determining superficial Rockwell hardness (with scales of 15X and 15Y).

This document is applicable to the determination of the apparent hardness of sintered metal friction materials with a thickness of not less than 0.5 mm.

2 Normative references

GB/T 230.1

GB/T 230.2

GB/T 231.1

GB/T 231.2

GB/T 231.4

GB/T 8170

JJG112

JJG150

JJG884

3 Terms and Definitions

There are no terms or definitions that require definition in this document.

4.1 Symbols, abbreviations and explanations

4.1.1 The symbols, abbreviations and corresponding explanations of the Brinell hardness test are shown in Table 1.

Table 1 Brinell hardness symbols, abbreviations and descriptions

Symbol/Abbreviation	Term
Description	Unit
D	ball diameter mm
F	Test force N
d	Average indentation diameter, $d = \frac{d_1 + d_2}{2}$ mm