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Rockwell hardness test — Test method

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In the event of any doubts arising as to the contents,
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Foreword

This Japanese Industrial Standard has been revised by the Minister of Economy, Trade and Industry based on the provision of Article 14, paragraph (1) of the Industrial Standardization Act applied mutatis mutandis pursuant to the provision of Article 16 of the said Act in response to a proposal for revision of Japanese Industrial Standard with a draft being attached, submitted by The Japan Iron and Steel Federation (JISF), an accredited standards development organization. This edition replaces the previous edition (**JIS Z 2245**: 2016), which has been technically revised.

Attention is drawn to the possibility that some parts of this Standard may conflict with patent rights, published patent application or utility model rights. The relevant Minister is not responsible for identifying any of such patent rights, published patent application or utility model rights.

Rockwell hardness test — Test method

Introduction

This Japanese Industrial Standard has been prepared based on ISO 6508-1 : 2016, Edition 4, with some modifications of the technical contents.

The vertical lines on both sides and dotted underlines indicate changes from the corresponding International Standard. A list of modifications with the explanations is given in Annex JA.

1 Scope

This Standard specifies the method for Rockwell regular hardness and Rockwell superficial hardness tests for metallic materials, and is applicable to stationary and portable hardness testing machines. The scales and the scope of hardness are shown in Table 1 and Table 2.

For specific materials and products such as hardmetals, other standards shall apply (for instance, ISO 3738-1 and ISO 4498).

NOTE 1 Attention is drawn to the fact that in ISO 6508-1, the use of tungsten carbide composite for ball indenters (hereafter referred to as hardmetal indenter balls) is considered to be the standard type of ball indenters for Rockwell regular hardness and Rockwell superficial hardness, and steel ball indenters are allowed to be used only in the test complying with Annex A. This Standard will adopt hardmetal indenter balls as the standard indenter at the time of next revision (see Table 1, Table 2, 5.2, 6.3 and Table E.1). Even in this case, steel balls are planned to be used as the standard indenter in the test complying with Annex A.

NOTE 2 Attention is drawn to the fact that the result obtained with hardmetal indenter balls may be significantly different from the result obtained with steel balls.

NOTE 3 (Editor's note : this NOTE 3 is unrelated to English translation therefore omitted.)

NOTE 4 The International Standard corresponding to this Standard and the symbol of degree of correspondence are as follows.

ISO 6508-1 : 2016 *Metallic materials — Rockwell hardness test — Part 1 : Test method* (MOD)

In addition, symbols which denote the degree of correspondence in the contents between the relevant International Standard and JIS are IDT (identical), MOD (modified), and NEQ (not equivalent) according to ISO/IEC Guide 21-1.

WARNING Persons carrying out tests based on this Standard should be familiar with normal laboratory practice. This Standard does not purport to address all of the safety problems, if any, associated with its use.

It is the responsibility of the user of this Standard to establish appropriate safety and health practices.

2 Normative references

Part or all of the provisions of the following standards, through reference in this text, constitute provisions of this Standard. The most recent editions of the standards (including amendments) indicated below shall be applied.

JIS B 7726 *Rockwell hardness test — Verification and calibration of testing machines and indenters*

JIS B 7730 *Rockwell hardness test — Calibration of reference blocks*

JIS G 0202 *Glossary of terms used in iron and steel (Testing)*

3 Terms and definitions

For the purpose of this Standard, the terms and definitions given in **JIS G 0202** apply.

4 Principle

An indenter of the size, shape and material specified in this Standard is forced into the surface of a test piece under two test force levels using the specific conditions defined in Clause 8. The specified preliminary test force is applied and the initial indentation depth is measured, followed by the application and removal of a specified additional test force, returning to the preliminary test force. The final indentation depth is then measured, and Rockwell regular hardness value and Rockwell superficial hardness value are derived from the difference between the final and initial indentation depths and the two constants N and S (see Figure 1, Table 1, Table 2 and Table 3) as shown in Formula (1) :

$$\text{Rockwell regular hardness or Rockwell superficial hardness} = N - \frac{h}{S} \quad \cdots\cdots\cdots\cdots\cdots\cdots (1)$$

NOTE The indentation depth means the penetration depth of an indenter.

5 Symbols, abbreviated terms and designations

5.1 Symbols and abbreviated terms

See Figure 1, Table 1, Table 2 and Table 3 for symbols and abbreviated terms.