SLOVENSKI STANDARD
SIST EN ISO 6508-1:2015

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Kovinski materiali - Preskus trdote po Rockwellu - 1. del: Preskusna metoda (ISO 6508-1:2015)

Metallic materials - Rockwell hardness test - Part 1: Test method (ISO 6508-1:2015)

Metallische Werkstoffe - Härteprüfung nach Rockwell - Teil 1: Prüfverfahren (ISO 6508-1:2015)

Matériaux métalliques - Essai de dureté Rockwell - Partie 1: Méthode d'essai (ISO 6508-1:2015)

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Metallic materials - Rockwell hardness test - Part 1: Test method (ISO 6508-1:2015)

Matériaux métalliques - Essai de dureté Rockwell - Partie 1: Méthode d'essai (ISO 6508-1:2015)

Metallische Werkstoffe - Härteprüfung nach Rockwell - Teil 1: Prüfverfahren (ISO 6508-1:2015)

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EUROPÄISCHES KOMITEE FÜR NORMUNG

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Foreword

This document (EN ISO 6508-1:2015) has been prepared by Technical Committee ISO/TC 164 "Mechanical testing of metals" in collaboration with Technical Committee ECISS/TC 101 “Test methods for steel (other than chemical analysis)” the secretariat of which is held by AFNOR.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by September 2015, and conflicting national standards shall be withdrawn at the latest by September 2015.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

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Endorsement notice

The text of ISO 6508-1:2015 has been approved by CEN as EN ISO 6508-1:2015 without any modification.

INTERNATIONAL STANDARD

ISO 6508-1

Third edition
2015-03-01

Metallic materials — Rockwell hardness test —

Part 1: Test method

Matériaux métalliques — Essai de dureté Rockwell —

Partie 1: Méthode d'essai

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT) see the following URL: Foreword - Supplementary information

The committee responsible for this document is ISO/TC 164, *Mechanical testing of metals*, Subcommittee SC 3, *Hardness testing*.

This third edition cancels and replaces the second edition (ISO 6508-1:2005), which has been technically revised.

ISO 6508 consists of the following parts, under the general title *Metallic materials — Rockwell hardness test*:

— *Part 1: Test method*

— *Part 2: Verification and calibration of testing machines and indenters*

— *Part 3: Calibration of reference blocks*

Metallic materials — Rockwell hardness test —

Part 1: Test method

1 Scope

This part of ISO 6508 specifies the method for Rockwell regular and Rockwell superficial hardness tests (scales and applicable range of application according to Table 1) for metallic materials and is applicable to stationary and portable hardness testing machines.

For specific materials and/or products, other specific International Standards apply (for instance, ISO 3738-1 and ISO 4498).

NOTE Attention is drawn to the fact that the use of tungsten carbide composite for ball indenters is considered to be the standard type of Rockwell indenter ball. Steel indenter balls are allowed to continue to be used only when complying with Annex A.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 6508-2:2015, *Metallic materials — Rockwell hardness test — Part 2: Verification and calibration of testing machines*

ISO 6508-3:2015, *Metallic materials — Rockwell hardness test — Part 3: Calibration of reference blocks*

3 Principle

An indenter of specified size, shape, and material is forced into the surface of a test specimen under two force levels using the specific conditions defined in Clause 7. The specified preliminary force is applied and the initial indentation depth is measured, followed by the application and removal of a specified additional force, returning to the preliminary force. The final indentation depth is then measured and the Rockwell hardness value is derived from the difference, h, in the final and initial indentation depths and the two constants N and S (see Figure 1, Table 1 and Table 2) as:

$$\text{Rockwell hardness} = N - \frac{h}{S} \qquad (1)$$

4 Symbols, abbreviated terms and designations

4.1 See Table 1, Table 2, Table 3, and Figure 1.

Table 1 — Rockwell Regular scales

Rockwell Regular hardness cale	Hardness symbol Unit	Type of indenter	Preliminary force F_0	Total force F	Scaling Constant S	Full Range Constant N	Applicable range of application (Rockwell Regular hardness scales)
A	HRA	Diamond cone	98,07 N	588,4 N	0,002 mm	100	20 to 95 HRA
B	HRBW	Ball 1,587 5 mm	98,07 N	980,7 N	0,002 mm	130	10 to 100 HRBW
C	HRC	Diamond cone	98,07 N	1,471 kN	0,002 mm	100	20[a] to 70 HRC
D	HRD	Diamond cone	98,07 N	980,7 N	0,002 mm	100	40 to 77 HRD
E	HREW	Ball 3,175 mm	98,07 N	980,7 N	0,002 mm	130	70 to 100 HREW
F	HRFW	Ball 1,587 5 mm	98,07 N	588,4 N	0,002 mm	130	60 to 100 HRFW
G	HRGW	Ball 1,587 5 mm	98,07 N	1,471 kN	0,002 mm	130	30 to 94 HRGW
H	HRHW	Ball 3,175 mm	98,07 N	588,4 N	0,002 mm	130	80 to 100 HRHW
K	HRKW	Ball 3,175 mm	98,07 N	1,471 kN	0,002 mm	130	40 to 100 HRKW

[a] The applicable range of application can be extended to 10 HRC if the surfaces of the diamond cone and spherical tip are polished for a penetration depth of at least 0,4 mm.

Table 2 — Rockwell Superficial scales

Rockwell Superficial hardness scale	Hardness symbol Unit	Type of indenter	Preliminary force F_0	Total force F	Scaling Constant S	Full Range Constant N	Applicable range of application (Rockwell Superficial hardness scales)
15N	HR15N	Diamond cone	29,42 N	147,1 N	0,001 mm	100	70 to 94 HR15N
30N	HR30N	Diamond cone	29,42 N	294,2 N	0,001 mm	100	42 to 86 HR30N
45N	HR45N	Diamond cone	29,42 N	441,3 N	0,001 mm	100	20 to 77 HR45N
15T	HR15TW	Ball 1,587 5 mm	29,42 N	147,1 N	0,001 mm	100	67 to 93 HR15TW
30T	HR30TW	Ball 1,587 5 mm	29,42 N	294,2 N	0,001 mm	100	29 to 82 HR30TW
45T	HR45TW	Ball 1,587 5 mm	29,42 N	441,3 N	0,001 mm	100	10 to 72 HR45TW

Scales using indenter balls with diameter 6,350 mm and 12,70 mm may also be used, if specified in the product specification or by special agreement. See ASTM E 18 for additional scales using these ball sizes.

NOTE 1 For certain materials, the applicable range of application might be narrower than those indicated.

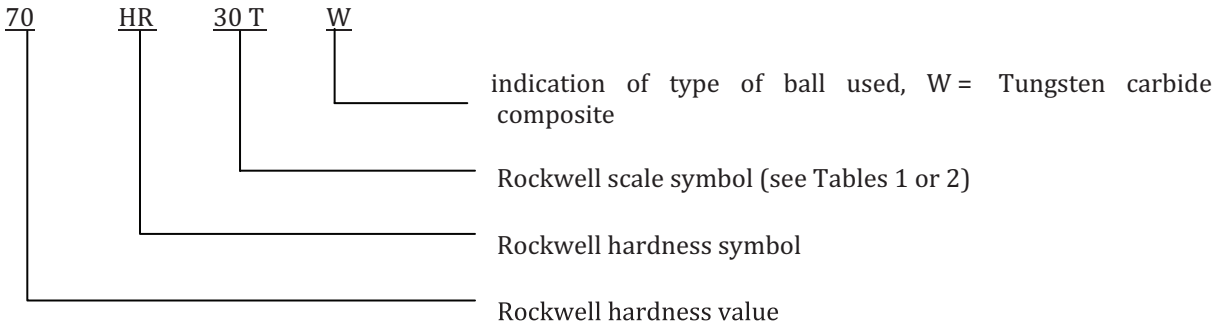
NOTE 2 The numbers representing the test forces were originally based on units of kgf. For example, the total test force of 30 kgf has been converted to 294,2 N.

Table 3 — Symbols and abbreviated terms

Symbol/ Abbreviated term	Definition	Unit
F_0	Preliminary test force	N
F_1	Additional test force (total force minus preliminary force)	N
F	Total test force	N
S	Scaling constant, specific to the scale	mm
N	Full range constant, specific to the scale	-
h	Permanent depth of indentation under preliminary test force after removal of additional test force (permanent indentation depth)	mm
HRA HRC HRD	Rockwell Regular hardness $= 100 - \frac{h}{0{,}002}$	
HRBW HREW HRFW HRGW HRHW HRKW	Rockwell Regular hardness $= 130 - \frac{h}{0{,}002}$	
HRN HRTW	Rockwell Superficial hardness $= 100 - \frac{h}{0{,}001}$	

4.2 The following is an example of the designation of Rockwell hardness.

EXAMPLE



NOTE 1 Previous versions of this part of ISO 6508 allowed the use of steel indenter balls, which required the suffix S.

NOTE 2 For the HR30TSm and HR15TSm scales defined in Annex A, a capital S and a lower-case m is used indicating the use of steel indenter balls and a diamond spot specimen holder.