INTERNATIONAL STANDARD

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Metallic materials — Hardness test — Rockwell superficial test (scales 15N, 30N, 45N, 15T, 30T and 45T)

Matériaux métalliques — Essai de dureté — Essai superficiel Rockwell (échelles 15N, 30N, 45N, 15T, 30T et 45T)

Reference number
ISO 1024 : 1989 (E)

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.

Draft International Standards adopted by the technical committees are circulated to the member bodies for approval before their acceptance as International Standards by the ISO Council. They are approved in accordance with ISO procedures requiring at least 75 % approval by the member bodies voting.

International Standard ISO 1024 was prepared by Technical Committee ISO/TC 164, *Mechanical testing of metals.*

It cancels and replaces ISO Recommendation R 1024 : 1969 and International Standard ISO 2712 : 1973, of which it constitutes a technical revision.

Annexes A and B form an integral part of this International Standard.

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Metallic materials — Hardness test — Rockwell superficial test (scales 15N, 30N, 45N, 15T, 30T and 45T)

1 Scope

This International Standard specifies a method for the Rockwell superficial hardness test (scales and field of application according to table 1) for metallic materials.

Table 1 — Conditions for Rockwell superficial hardness test

Hardness scale	Hardness symbol	Type of indenter	Preliminary test force, F_0 (N)	Additional test force, F_1 (N)	Total test force, F (N)	Field of application (Rockwell superficial hardness range)
15N	HR15N	Diamond cone	29,42	117,7	147,1	70 to 94 HR15N
30N	HR30N	Diamond cone	29,42	264,8	294,2	42 to 86 HR30N
45N	HR45N	Diamond cone	29,42	411,9	441,3	20 to 77 HR45N
15T	HR15T	Steel ball 1,587 5 mm	29,42	117,7	147,1	67 to 93 HR15T
30T	HR30T	Steel ball 1,587 5 mm	29,42	264,8	294,2	29 to 82 HR30T
45T	HR45T	Steel ball 1,587 5 mm	29,42	411,9	441,3	1 to 72 HR45T

The field of application for each scale and test force is dependent on the hardness and thickness of the test piece or surface layer tested. Guidance for the choice of scale is given in annex A.

2 Normative reference

The following standard contains provisions which, through reference in this text, constitute provisions of this International Standard. At the time of publication, the edition indicated was valid. All standards are subject to revision, and parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent edition of the standard given below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 1079 : 1989, *Metallic materials — Hardness test — Verification of Rockwell superficial hardness testing machines (scales 15N, 30N, 45N, 15T, 30T and 45T).*

3 Symbols and their meanings

3.1 See tables 1 and 2 and figures 1 and 2.

Table 2 — Symbols used

Symbol	Meaning
α	Angle of the diamond cone
R	Radius of curvature at the tip of the diamond cone
D	Diameter of steel ball
F_0	Preliminary test force
F_1	Additional test force
F	Total test force
h_0	Depth of indentation under preliminary test force before application of additional test force
h_1	Increase in depth of indentation under additional test force
e	Permanent increase in depth of indentation under preliminary test force after removal of additional test force, expressed in units of 0,001 mm
HR..N HR..T	Rockwell superficial hardness = 100 − e

3.2 The Rockwell superficial hardness is denoted by the symbol HR preceded by the hardness value and followed by a number (representing the total test force) and a letter together indicating the scale.

EXAMPLE

70 HR30N = Rockwell superficial hardness of 70 measured on the 30N scale with a total test force of 294,2 N

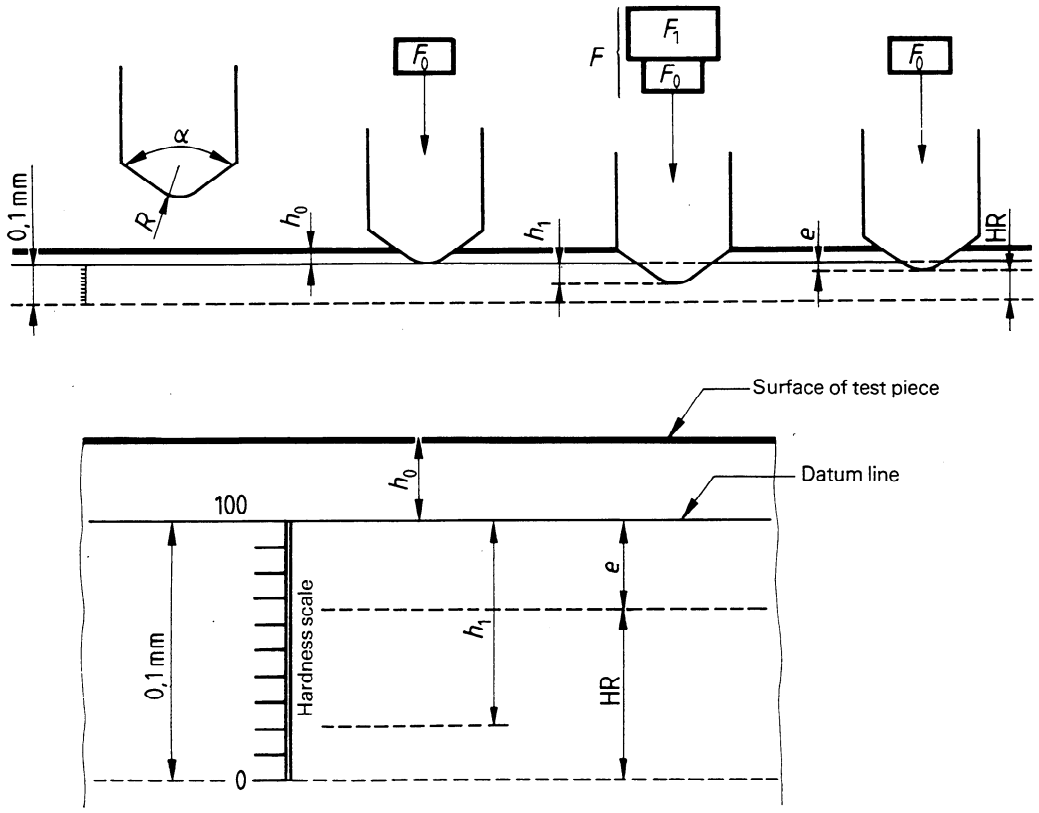


Figure 1 — Test with diamond cone