



## ASTM E 18

### **Standard Test Methods for Rockwell Hardness of Metallic Materials**

These test methods cover the determination of the Rockwell hardness and the Rockwell superficial hardness of metallic materials by the Rockwell indentation hardness principle. This standard provides the requirements for Rockwell hardness machines and the procedures for performing Rockwell hardness tests. This standard includes additional requirements in annexes:

- Verification of Rockwell Hardness Testing Machines
- Rockwell Hardness Standardizing Machines
- Standardization of Rockwell Indenter
- Standardization of Rockwell Hardness Test Blocks
- Guidelines for Determining the Minimum Thickness of a Test Piece
- Hardness Value Corrections When Testing on Convex Cylindrical Surfaces

This standard includes nonmandatory information in appendixes which relates to the Rockwell hardness test:

- List of ASTM Standards Giving Hardness Values Corresponding to Tensile Strength
- Examples of Procedures for Determining Rockwell Hardness Uncertainty

At the time the Rockwell hardness test was developed, the force levels were specified in units of kilograms-force (kgf) and the indenter ball diameters were specified in units of inches (in.). This standard specifies the units of force and length in the International System of Units (SI); that is, force in Newtons (N) and length in millimeters (mm). However, because of the historical precedent and continued common usage, force values in kgf units and ball diameters in inch units are provided for information and much of the discussion in this standard refers to these units.

The test principles, testing procedures, and verification procedures are essentially identical for both the Rockwell and Rockwell superficial hardness tests. The significant differences between the two tests are that the test forces are smaller for the Rockwell superficial test than for the Rockwell test. The same type and size indenters may be used for either test, depending on the



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scale being employed. Accordingly, throughout this standard, the term Rockwell will imply both Rockwell and Rockwell superficial unless stated otherwise.

### **Significance and Use**

The Rockwell hardness test is an empirical indentation hardness test that can provide useful information about metallic materials. This information may correlate to tensile strength, wear resistance, ductility, and other physical characteristics of metallic materials, and may be useful in quality control and selection of materials. Rockwell hardness tests are considered satisfactory for acceptance testing of commercial shipments, and have been used extensively in industry for this purpose.

Rockwell hardness testing at a specific location on a part may not represent the physical characteristics of the whole part or end product. Adherence to this standard test method provides traceability to national Rockwell hardness standards except as stated otherwise.

If you have any questions concerning this particular ASTM method, please feel free to give our office a call at (800) 334-5432 or email us your inquiry at [info@nhml.com](mailto:info@nhml.com).

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