Designation: E10 – 15

American Association State Highway
and Transportation Officials Standard
AASHTO No.: T70–86

Standard Test Method for Brinell Hardness of Metallic Materials[1]

This standard is issued under the fixed designation E10; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ε) indicates an editorial change since the last revision or reapproval.

This standard has been approved for use by agencies of the U.S. Department of Defense.

1. Scope*

1.1 This test method covers the determination of the Brinell hardness of metallic materials by the Brinell indentation hardness principle. This standard provides the requirements for a Brinell testing machine and the procedures for performing Brinell hardness tests.

1.2 This standard includes additional requirements in four annexes:

Verification of Brinell Hardness Testing Machines	Annex A1
Brinell Hardness Standardizing Machines	Annex A2
Standardization of Brinell Hardness Indenters	Annex A3
Standardization of Brinell Hardness Test Blocks	Annex A4

1.3 This standard includes nonmandatory information in an appendix which relates to the Brinell hardness test:

Table of Brinell Hardness Numbers	Appendix X1
Examples of Procedures for Determining Brinell Hardness Uncertainty	Appendix X2

1.4 At the time the Brinell hardness test was developed, the force levels were specified in units of kilograms-force (kgf). Although this standard specifies the unit of force in the International System of Units (SI) as the Newton (N), because of the historical precedent and continued common usage of kgf units, force values in kgf units are provided for information and much of the discussion in this standard refers to forces in kgf units.

1.5 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.*

2. Referenced Documents

2.1 *ASTM Standards:*[2]

E29 Practice for Using Significant Digits in Test Data to Determine Conformance with Specifications

E74 Practice of Calibration of Force-Measuring Instruments for Verifying the Force Indication of Testing Machines

E140 Hardness Conversion Tables for Metals Relationship Among Brinell Hardness, Vickers Hardness, Rockwell Hardness, Superficial Hardness, Knoop Hardness, Scleroscope Hardness, and Leeb Hardness

E384 Test Method for Knoop and Vickers Hardness of Materials

2.2 *American Bearings Manufacturer Association Standard:*

ABMA 10-1989 Metal Balls[3]

2.3 *ISO Standards:*

ISO/IEC 17011 Conformity Assessment—General Requirements for Accreditation Bodies Accrediting Conformity Assessment Bodies[4]

ISO/IEC 17025 General Requirements for the Competence of Calibration and Testing[4]

3. Terminology and Equations

3.1 *Definitions:*

3.1.1 *calibration*—determination of the values of the significant parameters by comparison with values indicated by a reference instrument or by a set of reference standards.

3.1.2 *verification*—checking or testing to assure conformance with the specification.

[1] This test method is under the jurisdiction of ASTM Committee E28 on Mechanical Testing and is the direct responsibility of Subcommittee E28.06 on Indentation Hardness Testing.

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[2] For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

[3] Available from American Bearing Manufacturers Association (ABMA), 2025 M Street, NW, Suite 800, Washington, DC 20036, http://www.americanbearings.org.

[4] Available from American National Standards Institute (ANSI), 25 W. 43rd St., 4th Floor, New York, NY 10036, http://www.ansi.org.

***A Summary of Changes section appears at the end of this standard**

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