



Standard Practice for Scleroscope Hardness Testing of Metallic Materials¹

This standard is issued under the fixed designation E 448; 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.

^{ε1} NOTE—Note 1 was editorially revised in December 2001.

1. Scope

1.1 This practice covers the determination of the Scleroscope² hardness of metallic materials (Part A), the verification of Scleroscope hardness instruments (Part B), and the calibration of standardized hardness test blocks (Part C).

1.2 The values stated in SI units are to be regarded as the standard. The values given in parentheses are for information only.

1.3 *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 and determine the applicability of regulatory limitations prior to use.*

2. Referenced Documents

2.1 ASTM Standards:

A 427 Specification for Wrought Alloy Steel Rolls for Cold and Hot Reduction³

E 140 Hardness Conversion Tables for Metals (Relationship Among Brinell Hardness, Vickers Hardness, Rockwell Hardness, Rockwell Superficial Hardness, and Knoop Hardness, and Scleroscope Hardness)⁴

3. Terminology

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 *forged roll Scleroscope hardness number (HFRSc or HFRSd)*⁵—a number related to the height of rebound of a diamond-tipped hammer dropped on a forged steel roll. It is measured on a scale determined by dividing into 100 units the

average rebound of a hammer from a forged steel roll of accepted maximum hardness.

NOTE 1—The flat striking surface of the hammer in the forged roll Scleroscope is slightly larger than the corresponding surface in the Scleroscope described in 3.1.3 (see Fig. 1). Hence the forged roll

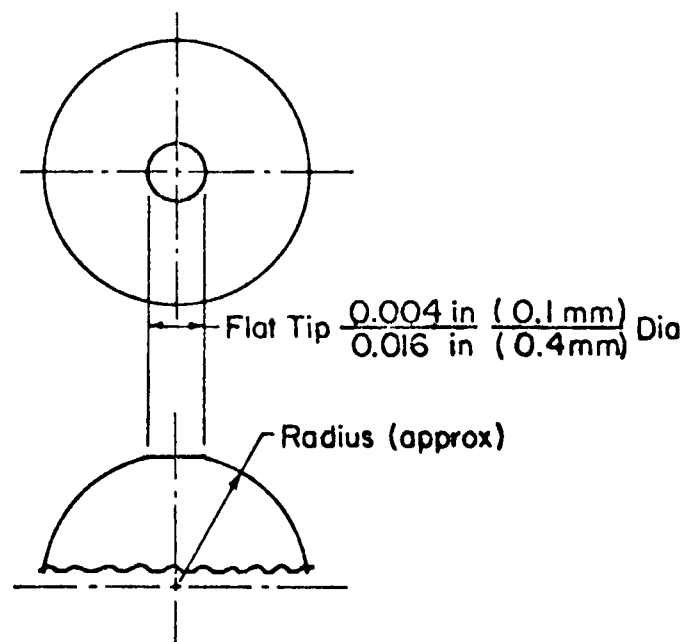


FIG. 1 Profile of Scleroscope Diamond Showing Range of Diameters of Flat Tip

Scleroscope yields correspondingly higher hardness numbers.

3.1.3 *Scleroscope hardness number (HSc or HSd)*—a number related to the height of rebound of a diamond-tipped hammer dropped on the material being tested. It is measured on a scale determined by dividing into 100 units the average rebound of the hammer from a quenched (to maximum hardness) and untempered high carbon water-hardening tool steel test block of AISI W-5.

3.1.4 *Scleroscope hardness test*—a dynamic indentation hardness test using a calibrated instrument that drops a diamond-tipped hammer (Note 2) from a fixed height onto the surface of the material under test. The height of rebound of the hammer is a measure of the hardness of the material.

¹ This practice is under the jurisdiction of ASTM Committee E-28 on Mechanical Testing and is the direct responsibility of E28.06 on Indentation Hardness Testing. Current edition approved July 30, 1982. Published December 1982. Originally published as E 448– 72. Last previous edition E 448 – 72 (1977).

² Registered trademark of the Shore Instrument & Mfg. Co., Inc.

³ *Annual Book of ASTM Standards*, Vol 01.05.

⁴ *Annual Book of ASTM Standards*, Vol 03.01.

⁵ The conversion from Forged Roll “C” Scleroscope hardness to Vickers hardness contained in Specification A 427 and to Rockwell C hardness contained in Standard E 140 are presently the only Scleroscope hardness conversions in ASTM standards.