Portable Steel Hardness Tester

Model 316

The **Model 316 Portable Steel Hardness Tester** is designed for accurate, on-site hardness measurement of steel materials. It measures hardness within a range of **20 to 65 HRC (Rockwell C equivalent)** with an accuracy of **±1.5 HRC**.

This instrument utilizes a **hand-held impact indenter** that drives a **1/16-inch diameter carbide ball** into the test surface using a precisely calibrated impact force. The resulting indentation is measured directly using an **illuminated 60X microscope** equipped with a calibrated reticle, ensuring reliable and repeatable readings.

For quality assurance and traceability, **certification of the microscope and/or a calibrated test block**—traceable to **NIST standards**—is available upon request for a nominal fee.

Standard Kit Includes:

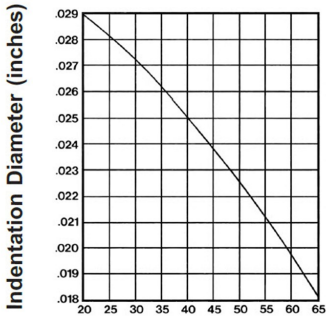
- Hand-held impact indenter
- Illuminated 60X measuring microscope
- Batteries
- Calibrated test block
- Durable carrying case
- NIST 5 Point Calibration Certificate Available on 316 Scope
- NIST 5 Point Certification Available on Test Block

PTC Metrology is Accredited by A2LA to ISO/IEC 17025:2017 Our certificate number 1896.01

The illumination system is a LED Maglite® coupled to a fiber optic light pipe. The flashlight is powered by two AAA batteries. The large end of the battery spring must be snapped into the tailcap. Install batteries with the "+" end facing the head end of the flashlight. Backwards installation can damage the LED.

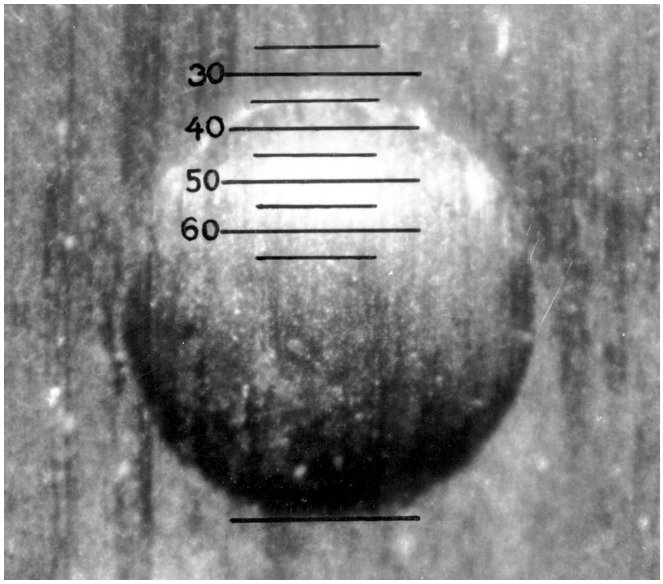
The Model 316 is an ideal solution for **field inspections, quality control, and in-situ hardness testing** where portability and precision are essential.

Accuracy	±1.5 points
Length	7.5 in. (19.1 cm)
Bass Diameter	7/8 in. (2.2 cm)
Microscope Illuminator	2 AAA Batteries
Weight	2 lbs (0.9 kg)
Shipping Weight	4 lbs (1.8 kg)



CALIBRATION CURVE FOR MODEL 316

MODEL 316 INSTRUCTIONS



Unretouched photomicrograph, showing the microscope reticle in position over an indentation. This measurement indicates a value of 33HRC on the equivalent Rockwell C Scale.

INSTRUMENT CHECK

A marked and calibrated steel test block is provided for checking the accuracy of this instrument. IMPORTANT: When making this check, place the test block on a smooth, flat, heavy, and rigid metal surface. Do not read the factory made diamond indentation which was done to calibrate the test block. Indentations made with the Model 316 indenter are smooth and round; as opposed to the sharper, more conical shaped indentation made from diamond indenters. Only the test block surface with the PTC® mark should be used, this surface must not be re-worked. Tests must not be made any closer than three diameters, as previous indentations distort the hardness of the surrounding area.

Make several tests of the test block. If the measurement of the test block does not check with the microscope, the instrument should be returned to the factory for recalibration.

OPERATING INSTRUCTIONS

Prepare the sample by cleaning the surface with a piece of emery paper or steel wool. The sample should be at least as smooth as can be obtained using size 400-A emery paper. The sample, if small, must be placed on a heavy, smooth, hard surface when the indentation is made. This is to overcome a lack of mass in thin sections.

Sheet metals to be measured should be at least 0.020” (0.5 mm) thick A smooth, hard metal surface must back up the sample. If the sample and the backing plate are not in contact, an erroneous reading will result.

Hold the indenter in the hand at right angles to the surface of the sample. Slowly force the tip into the sample until the indenter trips. A clean, smooth, shallow cavity will result.

Twist the barrel of the flashlight until the light comes on so that the base is illuminated. Place the microscope over the sample so that the hole in the microscope base is over the indentation. Center the indentation in the sight so that the reticle is tangential to the indentation (see photo).

The hardness may now be obtained by measuring the diameter of the indentation with the scale in the microscope. The values are in equivalent Rockwell C Scale. Several measurements should be made as the sample being tested may have soft or hard spots.

PARTS LIST	MODEL 316
316.2	INDENTER
316.22	INDENTER TIP
316.29H	TEST BLOCK 60-65 HRC
316.29L	TEST BLOCK 40-59 HRC
316.29S	TEST BLOCK 30-39 HRC
316.8	LED MAGLITE WITH LIGHT PIPE

LIMITED LIABILITY WARRANTY

PTC® products are covered by a limited liability warranty from defects in material and workmanship for one year from date of purchase. This warranty does not apply if, in the judgement of PTC®, the product fails due to damage from shipment, handling, storage, accident, abuse or misuse, or if it has been used or maintained in a manner not conforming to product's instructions, has been modified in any way, or has a defaced or removed serial number. Repair by anyone other than PTC® or an approved agent voids this warranty. The maximum liability of PTC® is the product purchase price.

PTC® Instruments is the leading manufacturer of durometers and surface thermometers in the world. Our factory and calibration lab is located in Los Angeles, California U.S.A. Doc #2112-18