



# Steel Hardness Tester

## Model 415C Equivalent Rockwell C Scale



Made In U.S.A.



Model 415C shown above

- **Range of 20 to 67 HRC (Equivalent Rockwell C Scale)**
- **Accuracy of  $\pm 1.5$  points**
- **Direct Reading Analog Scale**
- **Easily Mounts in Drill Press or Mill**

The Model 415C Metal Hardness Tester is designed for use in machine shops, laboratories; and by inspection and quality control personnel, heat treaters, tool and die makers, mechanics, welders metallurgists, etc. This unique instrument is the easiest and most economical way of grading and checking various metals in the equivalent Rockwell C Scale range of 20 to 67HRC.

The chassis is made from aerospace aluminum, which houses a high precision displacement gauge. The shank at the top is used to hold the instrument in a mill, drill press, or lathe chuck. The lower end contains the indenter and mainspring.

The impression made by the indenter in the metal being tested is very small and is equivalent to a superficial examination in size. The travel of the indenter, caused by the resistance of the metal sample surface, results in the dial readout in equivalent Rockwell C Scale. Minimum sample thickness is 0.025" for most materials. If the indenter does not make a dimple on the opposite side, the material is thick enough for accurate testing.

The instrument comes complete with two Test Blocks (316.29H & 316.29L), Hardness Conversion Chart, and Carrying Case.

### SPECIFICATIONS

1. Range ..... 20 to 67 HRC (Equivalent Rockwell C Scale).
2. Accuracy .....  $\pm 1.5$  points.
3. Dimensions:
  - Length.....6-3/4 in. (17.1 cm).
  - Depth .....1-1/16 in. (2.7 cm).
  - Indicator Diameter .....1-9/16 in. (4.0 cm).
4. Weight (unit only) ..... 12 oz. (340 g)  
(with case & blocks)..... 2 lb. 6 oz. (1.1 kg).
5. Shipping weight..... 4 lb. (1.8 kg).

### CERTIFICATION SERVICE

PTC® can certify steel hardness blocks using NIST traceable standards for a nominal cost. Test results include five tests and the average value of the block.

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## OPERATING INSTRUCTIONS

This instrument has a factory-set preload and comes calibrated and ready to use. Due to the preload, the dial gauge does not read zero or align vertically at rest. Do not turn the dial indicator unless the unit needs to be reset.

Without removing the blue cap, insert the shank of the Model 415C securely into a 1/2 inch chuck in your mill, drill press, or lathe. A sturdy setup is essential for proper operation and long diamond life. The surface of the piece to be tested must be smooth, clean, and perpendicular to the long axis of the instrument. Allow sufficient clearance between the hardness tester and the drill press platform for the test block or sample being tested. Do not let the diamond indenter drag on the test block or test piece as the diamond will break.

The tester is shipped ready to use, however, a calibration check may be performed as needed. Insert a clean, smooth portion of the test block (supplied with the hardness tester) directly beneath the diamond tipped indenter in the base of the hardness tester. **All measurements must be made at least 3 diameters apart to avoid breaking the diamond indenter.** Remove the blue cap and carefully lower the quill or handle until the indenter contacts the test block surface. Then slowly increase the force until the base of the hardness tester makes full contact with the test block surface. While exerting sufficient force to hold the base of the hardness tester in full contact with the test block, and the gauge pointer steady, check to see that the tester reads the test block hardness. The block must be held in position firmly, any movement while a load is on the indenter will break the diamond tip.

When making tests, it is important that the test block or sample be properly supported on a heavy, flat surface. Per ASTM E-18, only the block's test surface with the PTC® mark should be used; this surface must not be reworked.

Raise the hardness tester and move the test block to an unused portion of the block. Run the test at least three times and adjust the rim of the gauge to set the dial at the average of the readings. This is very important, as minor hardness fluctuations may occur in even something as precise as a test block. Once this has been adjusted, the hardness tester is good for many consecutive readings before checking it against the test block again.

The Model 415C Hardness Tester is now calibrated at a known hardness value and again ready for use. Remove the test block and substitute the metal part to be tested. Remember, it is critical that the sample is held firmly and not allowed to shift or move during the test as the resulting motion will break the diamond. Carefully lower the drill press feed handle or quill until the diamond tipped indenter rests on the sample's surface, then slowly increase the force until the base of the hardness tester fully contacts the metal's surface. Read the equivalent Rockwell C Scale hardness directly on the dial. Make several readings and average the results.

## OTHER HARDNESS TESTING PRODUCTS:

- **Portable Equivalent Rockwell C Scale Tester**
- **Equivalent Rockwell B Scale Tester for mill, drill press, or lathe chuck mounting**
- **Conversion Calculators for Rockwell B**
- **Durometers & Test Stands for all applications**

## 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.*



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