

Micro-Metrics Co. H-501 Pencil Hardness Gauge

The Micro-Metrics Pencil Hardness Gauge is practical for use in the laboratory, on the production line, or in the field to assess quantitatively the rigidity or firmness (elastic modulus) of organic coatings applied to rigid substrates such as metal. Hardness values may define requirements for particular coatings applications or may be used to evaluate state-of-cure or aging of coating.



Principle: When two materials of different degrees of hardness or rigidity are forced against each other, one of the materials either yields or crumbles, while the other is unaffected. Thus a scale of relative hardness can be established on the basis of the ability of one material to scratch or deform another. This principle has long been used in the mineralogy field where it is known as the Mohs Hardness Scale (F. Mohs, 1820). Thus, the hardest material, diamond, is arbitrarily given a hardness value of 10, and other materials range downward through Corundum-9, Quartz-7, Apatite-5, Calcite-3, and Talc-1. Fortuitously, mechanical drawing pencil leads of available grades cover a range of useful organic coatings. The crumbling mode of failure is also an essential characteristic of the drawing leads, which is necessary for this application.

The Micro-Metrics Pencil Hardness Gauge design allows the user to force pencil leads of increasing hardness values against a coated surface in a precisely defined manner until one-lead mars the surface. Surface hardness is defined by the hardest pencil grade that just fails to mar the painted or coated surface. Leads supplied with the Micro-Metrics Pencil Hardness Gauge, softest to hardest, are:

- 6B • HB • 5H
- 5B • F • 6H
- 4B • H • 7H
- 3B • 2H • 8H
- 2B • 3H • 9H
- B • 4H

Certain leads are supplied already mounted in the lead holders. The rest of the leads supplied are stored in the metal tube that is the guide for the gauge as each lead is brought into testing contact with the surface. The leads mounted in the holders are:

Position	Lead Grade
1	6B
2	4B
3	2B
4	HB
5	2H
6	4H
7	6H
8	8H

The Micro-Metrics Pencil Hardness Gauge is unique in that it provides a compact single unit for performing this test, rather than a set of easily lost individual pencils. The importance of this advantage is especially apparent when several individuals are working with a single instrument.



Five small circular pieces of 400 grit carborundum paper mounted on a plastic dressing disk are provided to facilitate dressing the lead points while they are in place in the gauge.

The Pencil Hardness Gauge, H-501, comes complete with instrument unit, 17 leads, dressing disk, and vinyl carrying case. Shipping weight: 14.90 oz. (423 g).

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