

# MHV Series

## Vickers Hardness Tester

Professional manufacturer, best quality with competitive price ●  
Recommended by the world UT NDT inspection association for training and examination ●  
Core technology with independent intellectual property rights, certificate of CE, GOST and etc.. ●



### Overview

Mitech MHV series vickers hardness tester, based on the principle that positive quadrangular pyramid diamond indenter presses the surface of the sample to produce indentation. By measuring the diagonal length of the indentation to achieve the measurement of the hardness of the material can be for small specimens, thin specimens, surface coating, heat treatment of the workpiece surface Vickers hardness test. With stable performance, strong structure, high reliability, simple operation, adopt high magnification optical measurement system, adjust the cold light source, photoelectric sensing technology and computer-aided means it has a powerful function. It is widely used in the fields of metal processing, electronics industry, mold parts, watch manufacturing, engineering quality inspection and so on. It is an ideal hardness tester for material research and testing.

## MHV Serious Technical Parameters Comparison Table

| Model  | MHV-5   | MHV-10   | MHV-30   | MHV-50  |
|--|---|--|--|---|
| Measurement range  | 40HV <sub>0.3</sub> ~2500HV <sub>5</sub>  | 8HV <sub>0.3</sub> ~2500HV <sub>10</sub>   | 10HV <sub>2</sub> ~2500HV <sub>30</sub>  | 40HV~2500HV   |
| Test force   | 2.942N、 4.904N、<br>9.807N、 19.6N、<br>29.42N、 49.04N   | 2.942N、 4.904N、<br>9.807N、 29.42N、<br>49.04N、 98.07N   | 19.6N、 29.4N、<br>49.0N、 98.0N、<br>196N、 294 N  | 9.807N、 49.04N、<br>98.07N、 196.1N、<br>294.2N、 490.4 N   |
| Loading and unloading mode                                       | Automatic operation   | Automatic operation  | Automatic operation  | Automatic operation   |
| Minimum detection unit   | 0.5μm   | 0.5μm  | 0.5μm  | 0.5μm   |
| Maximum height of applicable materials                           | 160mm   | 160mm  | 160mm  | 160mm   |
| Hardness symbol  | HV <sub>0.3</sub> 、 HV <sub>0.5</sub> 、<br>HV <sub>1</sub> 、 HV <sub>2</sub> 、<br>HV <sub>3</sub> 、 HV <sub>5</sub> | HV <sub>0.3</sub> 、 HV <sub>0.5</sub> 、<br>HV <sub>1</sub> 、 HV <sub>3</sub> 、<br>HV <sub>5</sub> 、 HV <sub>10</sub> | HV <sub>2</sub> 、 HV <sub>3</sub> 、<br>HV <sub>5</sub> 、 HV <sub>10</sub> 、<br>HV <sub>20</sub> 、 HV <sub>30</sub> | HV <sub>1</sub> 、 HV <sub>5</sub> 、<br>HV <sub>10</sub> 、 HV <sub>20</sub> 、<br>HV <sub>30</sub> 、 HV <sub>50</sub> |
| The conversion mode of the head and the objective lens           | Manual operation  | Manual operation   | Manual operation   | Manual operation  |
| Magnification of measuring microscope                            | 200x(testing)<br>100x(observing)  | 200x(testing)<br>100x(observing)   | 200x(testing)<br>100x(observing)   | 200x(testing)<br>100x(observing)  |
| Test to secure the load time                                     | 0~60s   | 0~60s  | 0~60s  | 0~60s   |
| Maximum distance from the center of the head to the machine wall | 135mm   | 135mm  | 135mm  | 135mm   |
| Display attributes   | LCD display   | LCD display  | LCD display  | LCD display   |
| Power supply   | AC220V/50Hz   | AC220V/50Hz  | AC220V/50Hz  | AC220V/50Hz   |
| Dimension of Exterior  | 540*220*650mm   | 540*220*650mm  | 540*220*650mm  | 540*220*650mm   |
| Machine weight   | 40kg  | 40kg   | 40kg   | 40kg  |

### Features

- Widely used in micro-specimen, thin specimen, surface coating, heat treatment of workpiece surface samples and etc. Vickers hardness test to meet different demands of scientific research institutions, precision machining and quality inspection departments and other materials research;
- Equipped with a variety of small load Vickers hardness scale spare;
- Innovative, rugged construction, high reliability, easy to operation, intuitive reading, high efficiency;
- Host performance is good, the workpiece surface quality and man-made factors have less impact on the hardness test results;
- Adopt electronic automatic loading system to control the main test force, eliminating the need to load the weight, the operation more convenient;
- Adopt large-screen LCD liquid crystal display, easy to operate, visually display the test results;
- Using high-rate optical sensing system and high-precision photoelectric sensing integrated high-tech product technology, greatly improving the test efficiency and accuracy;
- Adopt diamond indenter, durable and accurate;
- Adjustable cold light source measurement system that can control the light strength through the software;
- Optional photographic device, can be achieved on the measured indentation and material microstructure to shoot for later analysis;
- With ISO 6507, ASTM E92, JIS Z2244, GB/T4340.2 and other relevant domestic and foreign standards.

## Scope of Application

- Small, thin specimen.
- Surface coating.
- Surface heat treatment workpieces.
- Glass, ceramics, agate, artificial gemstones and other more brittle, hard non-metallic materials.

## Applications

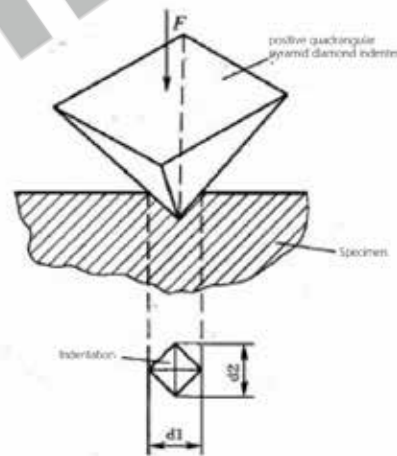
- Metal processing manufacturing quality control links
- University education teaching demonstration experiment
- Failure analysis test of metal material
- Testing of material hardness of scientific research institutions
- Quality inspection departments quality testing links

## Working Conditions

- Operation Temperature : 18 ~ 28°C;
- Relative Humidity : ≤65%;
- In an environment free from vibration, no corrosive medium;
- Installed on a flat basis.

## Working Principle

Micro-Vickers (or Knoop) hardness test principle is that put the provisions of the positive pyramid diamond indenter into the sample surface (with fixed experimental force) and maintain a certain length (holding), and then unloading. Finally, there is a positive quadrangular pyramid or kenup indentation with a square surface on the surface of the specimen. Then we can attain the area of indentation via measuring the length of the diagonal by a micrometer eyepiece. Then the corresponding Vickers (or Knoop) hardness values are obtained.



Usually Vickers hardness values can be converted according to the following formula

$$HV = \text{constant} \times \text{test force} / \text{indentation surface area} \approx 0.1891 F / d^2$$

Note: HV, Vickers hardness symbols

F, test force    d, the arithmetic mean of of the two diagonal d1, d2

## Serious Products Comparison Table

| Model   | MHV serious                  | MHV -Z serious               | MHVS serious                     | MHVS-Z serious                   |
|---|------------------------------|------------------------------|----------------------------------|----------------------------------|
| Measurement method                            | electric                     | electric                     | electric                         | electric                         |
| Working principle                             | indentation                  | indentation                  | indentation                      | indentation                      |
| Objective lens and indenter conversion method | manual                       | automatic                    | manual                           | automatic                        |
| Measuring range                               | 8HV~2500HV                   | 8HV~2500HV                   | 8HV~2500HV                       | 8HV~2500HV                       |
| Display                                       | LCD                          | LCD                          | Large screen LCD digital display | Large screen LCD digital display |
| Calibration                                   | Detection of standard blocks | Detection of standard blocks | Detection of standard blocks     | Detection of standard blocks     |
| Maximum height of specimen                    | 160mm                        | 160mm                        | 160mm                            | 160mm                            |
| Indication error                              | ±3.0%                        | ±3.0%                        | ±3.0%                            | ±3.0%                            |

## Configurations

|                 | NO. | Name                                | QTY. | Remarks  |
|-----------------|-----|-------------------------------------|------|--|
|                 | 1   | Main unit                           | 1    | include a micro-Vickers indenter, a 10×, a 20× |
|                 | 2   | Power cable                         | 1    |  |
|                 | 3   | Weights                             | 3    |  |
|                 | 4   | Big platform                        | 1    |  |
|                 | 5   | Middle platform                     | 1    |  |
|                 | 6   | V type platform                     | 1    |  |
| Standard Config | 7   | Screwdriver                         | 1    |  |
|                 | 8   | Cross screwdriver                   | 1    |  |
|                 | 9   | Horizontal adjustment screw         | 4    |  |
|                 | 10  | Digital micrometer eyepiece         | 1    | 10×  |
|                 | 11  | Vickers hardness block              | 2    |  |
|                 | 12  | Spare fuse                          | 2    |  |
|                 | 13  | Spare bulbs                         | 2    | 6V/2A  |
|                 | 14  | Plastic dust cover                  | 1    |  |
|                 | 15  | Attached files                      | 1    |  |
|                 | 16  | Host accessories box                | 2    |  |
| Optional Config | 1   | DM-2003video measurement device     | 1    |  |
|                 | 2   | Computer automatic measuring device | 1    |  |