



Data Sheet

HTMV 1000MD V2.0

HTMV 1000MD V2.0**Automatic Micro-Vickers Hardness Tester**

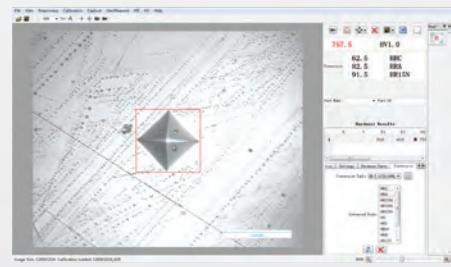
› Automatic Micro-Vickers Hardness Tester integrated with state of art technologies, optics, mechanical features, electronic control, digital imaging, image analysis, computer processing. Automatic test table, automatic and manual reading, hardening depth, film thickness, distance between two points of metals and some non-metallic materials and various films. Sample surface morphology function.

Application

› Suitable for ferrous metal, non-ferrous metals, IC thin sections, coatings, ply-metals, glass, ceramics, agate, precious stones, thin plastic sections etc.

Reference standard

› ISO 6507, ASTM E384, JIS Z2244

**Table 1**

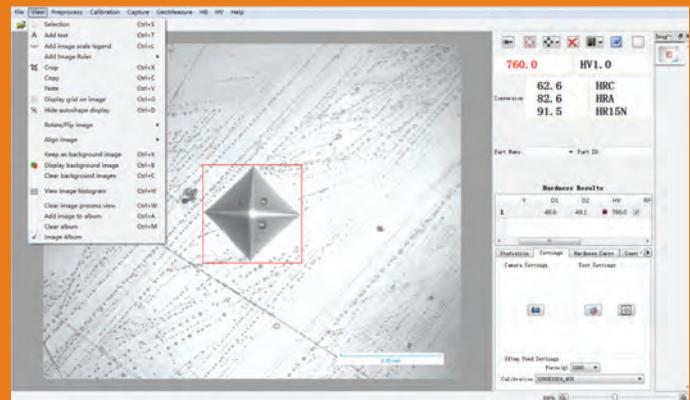
Standard hardness range	Displayed value repeatability %		
	HV5~HV100	HV0.2~HV5	<HV0.2
≤225HV	≤3	≤6	≤9
>225HV	≤2	≤4	≤5

Parameters:

- > Operating system: WIN XP, WIN7
- > Digital imaging system
- > High resolution: 130 million pixel
- > High speed acquisition: 1280x1024 resolution, 25 FPS
- > High definition: Black and white images are clear and defined
- > Target surface size: 1/2"

X-Y automatic test table

- > Table size: 100x100x50 mm
- > Maximum travel: 50x50 mm
- > Minimum step: Less than 1µm
- > Movement speed: Adjustable
- > Control mode: Manual control, electric control, computer control

**X-Y test table - computer control mode**

- > Location movement: Test table directly moves to the software input coordinates
- > Point movement: Selecting a point on the sample, the table moves to place it below the indenter
- > Directional movement: Click the eight directions to move the test table with set up movements
- > Arbitrary movement: Click any directions to move the test table with set up movements for sample surface study
- > Variable speed movement: Two speeds (fast and slow) test table moving, adjustable
- > Other function: Original position arbitrary setting, automatic reset, mechanical limit, etc.

Measuring method

- > Automatic mode—Automatic test table moving (X and Y direction) + automatic

- > Manual mode 1—Automatic loading + manual eyepiece scribed line measurement
- > Manual mode 2—Manual test table moving + manual focus + Automatic / manual measurement

Automatic / manual reading

- > Automatic reading time: Single indentation reading time is about 300 milliseconds
- > Automatic measurement precision: 0.1µm
- > Automatic measurement repeatability: ±0.8%
- > Manual reading: Manual pick, automatic search points, 4 points measurement, 2 diagonal measurement

Results save / output

- > Save / output : measurement data and parameters, including D1, D2, HV, X, Y, etc.
- > Save / output : effective hardening layer depth curve report, image.

Table 2

Hardness	Displayed value tolerance %														
	Hardness HV														
	50	100	150	200	250	300	350	400	450	500	600	700	800	900	1000
HV 0.01															
HV 0.015	10														
HV 0.02	8														
HV 0.025	8	10													
HV 0.05	6	8	9	10											
HV 0.1	5	6	7	8	8	9	10	10	11						
HV 0.2		4		6		8		9		10	11	11	12	12	
HV 0.3		4		5		6		7		8	9	10	10	11	11
HV 0.5		3		5		5		6		6	7	7	8	8	9
HV 1		3		4		4		4		5	5	5	6	6	8
HV 2		3		3		3		4		4	4	4	4	5	6
HV 3		3		3		3		3		3	4	4	4	4	5
HV 5		3		3		3		3		3	3	3	3	4	4
HV 10		3		3		3		3		3	3	3	3	3	3
HV 20		3		3		3		3		3	3	3	3	3	3
HV 30		3		3		2		2		2	2	2	2	2	2
HV 50		3		3		2		2		2	2	2	2	2	2
HV 100						3		2		2	2	2	2	2	2

1: When the indentation diagonal length is less than 0.020 mm, the table does not display the value.

2: For intermediate values, the maximum allowable error can be obtained by interpolation.

3: About the Micro Hardness Tester value in the table is 0.001mm or indentation diagonal length of the average of 2% of the maximum permissible error given, please select the bigger.

Software function:

- > **System linkage:** System - hardness tester linkage through communication interface.
- > **Pressure linkage:** When converting test force, the system percepts the test force change and displays in real time.
- > **Turret linkage:** Software shifting controls between objective and indenter without manual control.
- > **Loading linkage:** Automatic loading control.
- > **Measuring linkage:** The software controls the turret, and after loading,directly reading the Vickers hardness value.
- > **Light source linkage:** Manual focus.
- > **Image acquisition:** Real time indentation display, saving and printing.
- > **Automatic measurement:** Automatically detect the four indentation vertices.

- > **Automatic point search:** The system automatically finds the best vertices, greatly reduce the human error.
- > **Diagonal measurement:** By just one mouse click on the top left and lower right corner of the indentation the hardness value will be displayed.
- > **Four point measurement:** Selecting the four indentation points the hardness value will be displayed.
- > **Hardness conversion:** According to international standard, automatically convert the hardness value between Brinell, Rockwell, Vickers and Knoop with real-time display.
- > **Graphic report:** Automatic record of measurement data, automatic generation of hardness-depth curves, saving or printing reports generated as Word documents.
- > **Results statistics:** Output the multiple measured indentation results in Excel format and automatically counts the measurement number, maximum value, minimum value, average value, variance, etc. of hardness.
- > **Automatic displacement:** Equipped with high precision X-Y automatic test table.
- > **Automatic identification:** Leading indentation automatic identification technology, read D1 / D2 and HV value in 0.3 seconds.
- > **Stable performance:** The indentation of non mirror polishing, uneven light, not in the center can be read automatically.
- > **Powerful functions:** Manual reading, automatic reading, hardness conversion, depth-hardness curve, indentation image, picture and text reports.
- > **Automatic scanning:** Automatically scan the sample edge and shape.

Model	HTMV 1000MD V2.0
Test force control	Weights - Load electronic controlled
Load selection	Right side handle
Main loads	10gf, 25gf, 50gf, 100gf, 200gf, 300gf, 500gf, 1000gf
Dwell time	0~60s
Loading time	12s
Load applying speed (indenter descending speed)	0.04mm/s
Test force tolerance	±1%
Test cycle type	Semi-automatic type: manual - focus Automatic - load, dwell, unload, measurement of the indentation, show of the hardness value
Hardness scales	HV0.01, HV0.025, HV0.05, HV0.1, HV0.2, HV0.3, HV0.5, HV1 Optional: HK0.01, HK0.025, HK0.05, HK0.1, HK0.2, HK0.3, HK0.5, HK1
Hardness test range	1HV~2967HV
Hardness resolution	0.1HV
Repeatability hef/%	Table 1
Scale conversion	HV, HK, HRA, HRB, HRC, HRD, HRE, HRF, HRG, HRK, HR15N, HR30N, HR45N, HR15T, HR30T, HR45T, HS, HBW - According to ASTM E140
Turret type	Automatic
CCD camera pixel	1.3 Million
Microscope eyepiece	10x
Objectives	10x, 40x
Microscope min. measurement unit	0.0625µm (40x objective) (10x objective is for observation purpose only)
Microscope max. measurement length	200µm (40x objective) (10x objective is for observation purpose only)
CCD min. measurement unit	0.025µm (40x objective) (10x objective is for observation purpose only)
CCD max. measurement length	170µm (40x objective) (10x objective is for observation purpose only)
Measurable min. indent/indentation	10µm
Optical path	2 ways eyepiece
Optical function	optical diaphragm / field aperture / color filter
Illumination	Halogen lamp
Indenters	Diamond Micro-Vickers indenter
N. of indenters	1
Nose cone support diameter	3mm
Measurable min. indent/indentation	0.01mm
Indent measure algorithms	Automatic
Auto reading time	0.3 sec/1 indent
Specimen detection	Yes

Model	HTMV 1000MD V2.0
Movement program patterns	Zigzag, circle, arc, straight line, random, teaching etc.
Vertical test capacity	100mm
Horizontal test capacity	98mm
Anvils dimensions	Motorized cross test table, size: 110x110mm, Flat clamping test table size: 76x80mm, thin specimen test table size: ø 76mm, Filament clamping test table size: ø 60mm
Max. weight on anvils	50kg
X-Y travel	50x50mm
X axis speed	High: 1mm/s, low: 0.25mm/s
X axis resolution	0.002mm
Y axis speed	High: 1mm/s, low: 0.25mm/s
Y axis resolution	0.002mm
Z axis movement	Manual
Z axis resolution	Manual
Z axis speed	Manual
Display type	LCD
Display dimensions	4.3"
Input mode	PC o control panel keyboard (HV mode)
Displayed data	Hardness value, D1, D2, dwell time, test number, conversion scale, test force, date and time, indentation, objective
Statistics or functions	Max, min, average value, report, hardness curve
Data storage	500GB PC hard disk
Data output	Word, Excel format
Energy saving mode	Yes
Interfaces	Main body machine: 1x RS232, Control box: 1x USB, 1x XY interface, 1x RS232, (1x Z interface
Printer	Built-in printer - External Ink-Jet printer
Safety devices	Emergency switch
Operation temperature	23±5° C
Operation rel. humidity	≤65%
Weight	31kg
Dimensions	480x325x545mm
Power supply	230V, 50Hz
Voltage variance	±10%
Absorbed power	500W

Standard accessories		
Model	Description	Q.ty
MVT-DE10X	10x digital measuring eyepiece	1 pc
MVT-10XOB	10x objective	1 pc
MVT-40XOB	40x objective	1 pc
MVI-136	Diamond Micro-Vickers indenter	1 pc
MVT-MCTT110	Motorized cross test table 110x110mm	1 pc
MVT-FLCTT7680	Flat clamping test table 76x80mm	1 pc
MVT-TSTT76	Thin specimen test table ø 76mm	1 pc
MVT-FICTT60	Filament clamping test table ø 60mm	1 pc
HB-700800HV1	Hardness block 700-800 HV1	1 pc
HB-400500HV0.2	Hardness block 400-500 HV0.2	1 pc
MVT-CCDC	CCD camera	1 set
MVT-1.5XAD	1.5x adapter	1 pc
MVT-JSKAX	Joystick	1 pc
MVT-MTTCB	Motorized test table control box	1 pc
MVT-CNCBS	Control cables	1 set
VT-SDUSB	USB softdog	1 pc
MVT- MEASOFT	Measuring software	1 pc
MVT-PCMP	Computer (Hard disk: 500Gb, memory: 2G, 19" LCD screen)	1 set
MVT-PRNT	Ink jet printer	1 pc
MVT-RS232CBL	RS232 cables	1 pc
MVT-HL1520	Halogen lamp 12V, 15-20W	1 pc
MVT-4RS	Horizontal regulating screw	4 pcs
MVT-LV	Spirit level	1 pc
MVT-PC	Power cable	1 pc
MVT-6WS	Weights	6 pcs
MVT-WA	Weight axis	1 pc
MVT-SK	Service keys	1 set
MVT-ADC	Anti-dust cover	1 pc

Optional accessories	
Model	Description
MVT-KDI	Diamond Knoop indenter
MVT-DCTT120120	Digital cross test table 120x120mm
MVT-LTT108	Large plane test table ø 108mm
MVT-VTT40	V-shaped test table ø 40mm
MVT-WB	Work bench
MVT-APP	Additional printer paper roll

Vickers hardness blocks	
Model	Range
HB-V0.05/200-750	200-750 HV 0.05
HB-V0.1/200-750	200-750 HV 0.1
HB-V0.2/200-750	200-750 HV 0.2
HB-V0.3/200-750	200-750 HV 0.3
HB-V0.5/200-750	200-750 HV 0.5
HB-V1/200-750	200-750 HV 1

Knoop hardness blocks	
Model	Range
HB-K0.05/200-750	200-750 HK 0.05
HB-K0.1/200-750	200-750 HK 0.1
HB-K0.2/200-750	200-750 HK 0.2
HB-K0.3/200-750	200-750 HK 0.3
HB-K0.5/200-750	200-750 HK 0.5
HB-K1/200-750	200-750 HK 1



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