



VICKERS  
Hardness Testers

**Vickers Hardness**

Developed in 1921 as an alternative to the Brinell Hardness test, Vickers Hardness test is a common method to measure the hardness of materials, specifically thin sections and small parts. The test is done by pressing a square-based pyramid diamond indenter on a well prepared sample surface under specific load. The resulting indentation is measured by scaled eyepiece or through a specific analyzing software and converted in the HV scale.

The Vickers method can be divided in two ranges that, while using the same indenter, vary depending on the applied load: Macro and Micro range.

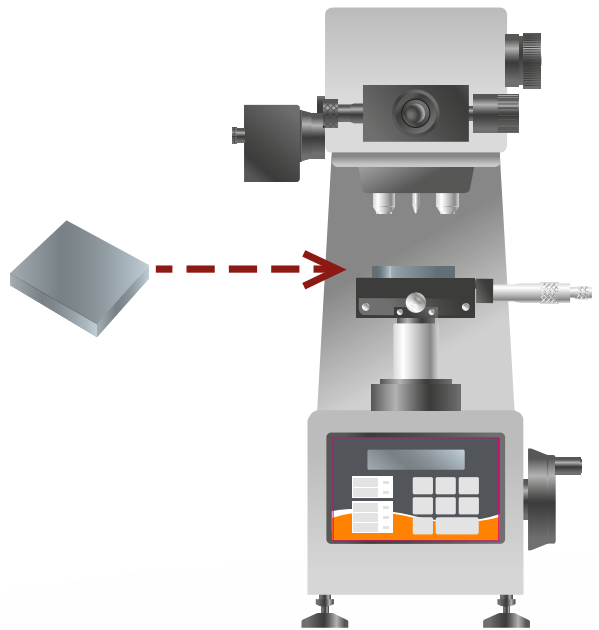
Vickers hardness numbers are always expressed as xxHVyy where xx is the hardness number, HV is the hardness scale and yy the applied load.

**Knoop Hardness**

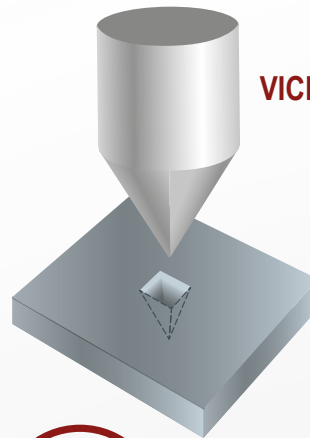
Developed in 1939, Knoop Hardness Test is used to measure the hardness of brittle materials or thin sheets. Knoop test can replace a Vickers test and use a pyramidal diamond indenter. It is expressed as HK.

**LOADING**

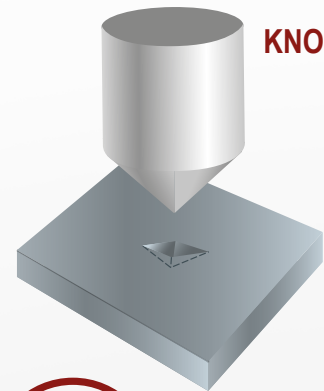
1



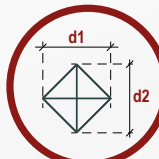
**2 INDENTATION**



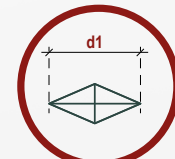
VICKERS



KNOOP

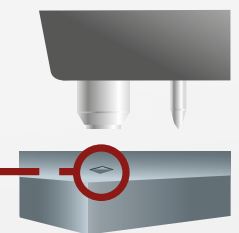


VICKERS



KNOOP

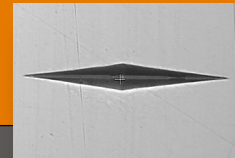
**3 DIRECT READING**





Vickers				
Scale	Indenter	Indentation time	Sample preparation	Application
HV0.01	Pyramidal diamond	10 to 15 seconds	Polished	Small samples, thin layer, ceramics, CHD
HV0.02	Pyramidal diamond	10 to 15 seconds	Polished	Small samples, thin layer, ceramics, CHD
HV0.35	Pyramidal diamond	10 to 15 seconds	Polished	Small samples, thin layer, ceramics, CHD
HV0.5	Pyramidal diamond	10 to 15 seconds	Polished	Small samples, thin layer, ceramics, CHD
HV1	Pyramidal diamond	10 to 15 seconds	Polished	Hardness progressions, Surface hardness testing, CHD
HV2	Pyramidal diamond	10 to 15 seconds	Polished	Hardness progressions, Surface hardness testing, CHD
HV3	Pyramidal diamond	10 to 15 seconds	Polished	Hardness progressions, Surface hardness testing, CHD
HV5	Pyramidal diamond	10 to 15 seconds	Polished	Sintered materials, Welds
HV10	Pyramidal diamond	10 to 15 seconds	Ground	Sintered materials, Welds
HV20	Pyramidal diamond	10 to 15 seconds	Ground	Sintered materials, Welds
HV30	Pyramidal diamond	10 to 15 seconds	Ground	Jominy, surface hardness testing
HV50	Pyramidal diamond	10 to 15 seconds	Ground	Jominy, surface hardness testing
HV100	Pyramidal diamond	10 to 15 seconds	Ground	Jominy, surface hardness testing

Applicable standard ASTM E384 for Micro and Macro Ranges, ISO 6507 for Micro and Macro Ranges, JIS Z2244



Knoop				
Method	Indenter	Indentation time	Sample preparation	Application
HK 0.01	172° x 130° Pyramidal diamond	10 to 15 seconds	High Polished	Very thin layers
HK 0.025	172° x 130° Pyramidal diamond	10 to 15 seconds	High Polished	Very thin layers
HK 0.05	172° x 130° Pyramidal diamond	10 to 15 seconds	High Polished	Very thin layers
HK 0.1	172° x 130° Pyramidal diamond	10 to 15 seconds	High Polished	Very thin layers, embedded specimens
HK 0.2	172° x 130° Pyramidal diamond	10 to 15 seconds	High Polished	Very thin layers, embedded specimens
HK 0.3	172° x 130° Pyramidal diamond	10 to 15 seconds	High Polished	Very thin layers, embedded specimens
HK 0.5	172° x 130° Pyramidal diamond	10 to 15 seconds	High Polished	Very thin layers
HK 1	172° x 130° Pyramidal diamond	10 to 15 seconds	High Polished	Very thin layers
HK 2	172° x 130° Pyramidal diamond	10 to 15 seconds	High Polished	Very thin layers

Applicable standard ASTM E384, ISO 4545, JIS Z2251

# HTV 10DT / HTV 50DT V3.0

## Fully Automatic Vickers Hardness Tester

- > Automatic Vickers hardness tester adopts the integrated design of panel computer with Windows 7 operating system. CCD image acquisition system, show the indentation image directly on the touch screen and automatically detect the Vickers hardness value.
- > All testing parameters can be selected on the side panel computer. User friendly with touch screen.
- > CCD image acquisition system, shows the image clearly and detects the hardness value by touching the screen.
- > Separate screen for better view of results.
- > Automatic recognition and shifting between the objective and indenter.
- > Hardness scale conversion function.
- > With USB, VGA and LAN interfaces, the hardness measurement can be print out by USB interface printer.

- > Automatic data save, generate the hardness-depth curve and save as WORD or EXCEL document.
- > With motorized X-Y test table, automatic focusing and automatic measuring, it is the fully automation of Vickers hardness testing.

**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 E92, JIS Z2244



**Displayed value repeatability %**

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

**Displayed value tolerance %**

Hardness	Hardness HV															
	50	100	150	200	250	300	350	400	450	500	600	700	800	900	1000	1500
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	11
HV 1		3		4		4		4		5	5	5	6	6	6	8
HV 2		3		3		3		4		4	4	4	4	5	5	6
HV 3		3		3		3		3		3	4	4	4	4	4	5
HV 5		3		3		3		3		3	3	3	3	3	4	4
HV 10		3		3		3		3		3	3	3	3	3	3	3
HV 20		3		3		3		3		3	3	3	3	3	3	3
HV 30		3		3		2		2		2	2	2	2	2	2	2
HV 50		3		3		2		2		2	2	2	2	2	2	2
HV 100				3		2		2		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.



Model	HTV 10DT / HTV 50DT V3.0
Test force control	Load cell closed loop - Load electronic controlled
Load selection	Touch screen control panel
Main loads	HTV 10DT V3.0: 0.2kgf, 0.3kgf, 0.5kgf, 1kgf, 2kgf, 2.5kgf, 3kgf, 5kgf, 10kgf HTV 50DT V3.0: 0.5kgf, 1kgf, 2kgf, 2.5kgf, 3kgf, 5kgf, 10kgf, 20kgf, 30kgf, 50kgf
dwell time	0-60s
Loading time	0.2kgf-5kgf: 8s, 10kgf-50kgf: 10s
Load applying speed (indenter descending speed)	0.04mm/s
Test force tolerance	±1%
Test cycle type	Fully-automatic type: focus, load, dwell, unload, show of the hardness value
Hardness scales	HTV 10DT V3.0: HV0.2, HV0.3, HV0.5, HV1, HV2, HV2.5, HV3, HV5, HV10 HTV 50DT V3.0: HV0.5, HV1, HV2, HV2.5, HV3, HV5, HV10, HV20, HV30, HV50
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	1.30 Million
Microscope eyepiece	10x
Objectives	10x, 20x, 40x objectives
Optical path	2 ways eyepiece
Optical function	Optical diaphragm / field aperture / color filter
Illumination	Halogen lamp
CCD min. measuring unit	0.1µm (10x objective) 0.05µm (20x objective) 0.025µm (40x objective)
CCD max. measurement length	680µm (10x objective) 340µm (20x objective) 170µm (40x objective)
Measurable. indent/indentation	10µm
Auto-focus time	3s
Total enlargement resolution	0.06µm, 0.03µm, 0.015µm

Model	HTV 10DT / HTV 50DT V3.0
Indenters	Diamond Vickers indenter
N. of indenters	1
Nose cone support diameter	6.35mm
Indent measure algorithms	Automatic
Auto reading time	0.3 sec/1 indent
Specimen detection	Yes
Movement program patterns	Zigzag, circle, arc, straight line, random, teaching etc.
Vertical test capacity	185mm
Horizontal test capacity	130mm
Anvils dimensions	Motorized cross test table, size: 110x110mm
Max. weight on anvil	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	Motorized
Z axis resolution	0.00125mm
Z axis speed	High: 1mm/s, low: 0.0625mm/s
Display type	Touch screen
Display dimensions	External touch pad 15"   Internal touch screen 8"
Input mode	By tap touch
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	SSD 64GB
Data output	Word, Excel format
Energy saving mode	Yes
Interfaces	2x USB, 1x VGA, 1x LAN, 1x RS232 (15pin)
Safety device	Emergency switch
Operation temperature	23±5 °C
Operation rel. humidity	≤65%
Weight	52kg
Dimensions	560x335x675mm
Power supply	230 V
Voltage variance	±10%
Absorbed power	500W

**Standard accessories**

Model	Description	Q.ty
VT-10XOB	10x objective	1 pc
VT-20XOB	20x objective	1 pc
VT-40XOB	40x objective	1 pc
VI-136	Diamond Vickers indenter	1 pc
VT-MCTT110	Motorized cross test table 110x110mm	1 pc
HB-400500HV5	Hardness block 400-500 HV5	1 pc
HB-700800HV1	Hardness block 700-800 HV1	1 pc
VT-EXTCSC	External touch screen	1 pc
VT-HL1520	Halogen lamp 12V, 15-20W	1 pc
VT-4RS	Horizontal regulating screw	4 pcs
VT-LV	Spirit level	1 pc
VT-TSRC	Touch screen remote control	1 pc
VT-TP	Touch pen	1 pc
VT-MSE	Mouse	1 pc
VT-SKUSB	USB storage key	1 pc
VT-PC	Power cable	1 pc
VT-SK	Service keys	1 set
VT-ADC	Anti-dust cover	1 pc

**Optional accessories**

Model	Description
VT-CTT100100	Cross test table 100x100mm
VT-DCTT120120	Digital cross test table 120x120mm
VT-FLCTT7680	Flat clamping test table 76x80mm
VT-TSTT76	Thin specimen test table ø 76mm
VT-FICTT60	Filament clamping test table ø 60mm
VT-LTT108	Large plane test table ø 108mm
VT-VTT40	V-shaped test table ø 40mm
VT-WB	Work bench
VT-EXPR	External printer

**Vickers hardness blocks**

Model	Range
HB-V0.2/200-750	200-750 HV0.2 (HTV 5DT V3.0, HTV 10DT V3.0)
HB-V0.3/200-750	200-750 HV0.3 (HTV 5DT V3.0, HTV 10DT V3.0, HTV 30DT V3.0)
HB-V0.5/200-750	200-750 HV0.5
HB-V1/200-750	200-750 HV1
HB-V2/175-750	175-750 HV2
HB-V3/175-750	175-750 HV3
HB-V5/175-750	175-750 HV5
HB-V10/175-750	175-750 HV10 (HTV 10DT V3.0, HTV 30DT V3.0, HTV 50DT V3.0)
HB-V20/175-750	175-750 HV20 (HTV 30DT V3.0, HTV 50DT V3.0)
HB-V30/175-750	175-750 HV30 (HTV 30DT V3.0, HTV 50DT V3.0)
HB-V50/175-750	175-750 HV50 (HTV 50DT V3.0)

HTV 10D / HTV 50D V2.0



Automatic Vickers Hardness Tester

- > Automatic Vickers Hardness Tester integrates mechanical displacement, electronic control, digital imaging, image analysis, computer processing. Automatic test table computer control, screen indentation display.
- > Automatic reading and manual reading, accurately measures the HV hardness, hardening depth, film thickness of metals and some non-metallic materials and various films.
- > Sample surface morphology detection and rate printing.

Application

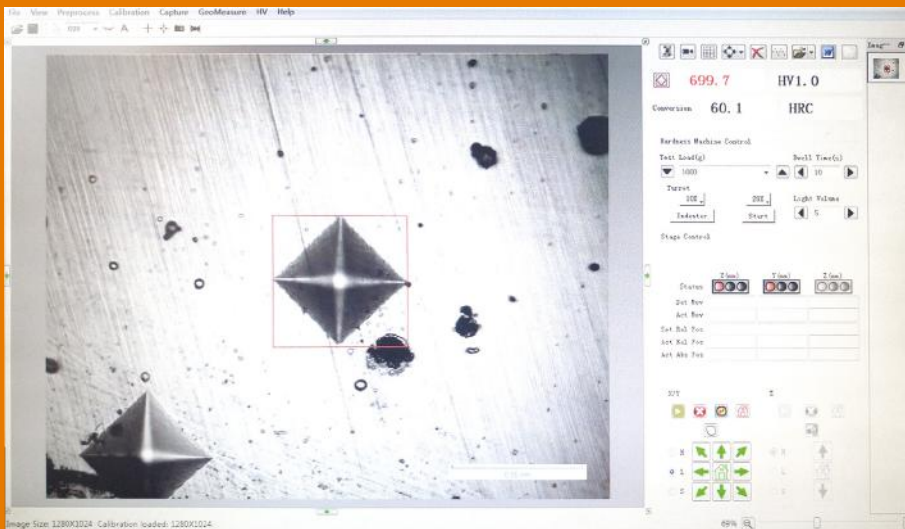
- > Suitable for ferrous metal, non-ferrous metals, IC thin sections, coatings, ply-metals, glass, ceramics, agate, precious stones, thin plastic sections etc.

Reference standard

- > ISO 6507, ASTM E92, JIS Z2244



Displayed value repeatability %			
Standard hardness range	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 settled up movements
- > Arbitrary movement: Click any directions to move the test table with settled 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.

Displayed value tolerance %																
Hardness	Hardness HV															
	50	100	150	200	250	300	350	400	450	500	600	700	800	900	1000	1500
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	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	11	
HV 1		3		4		4		4	5	5	5	6	6	6	8	
HV 2		3		3		3		4	4	4	4	4	5	5	6	
HV 3		3		3		3		3	3	4	4	4	4	4	5	
HV 5		3		3		3		3	3	3	3	3	3	4	4	
HV 10		3		3		3		3	3	3	3	3	3	3	3	
HV 20		3		3		3		3	3	3	3	3	3	3	3	
HV 30		3		3		2		2	2	2	2	2	2	2	2	
HV 50		3		3		2		2	2	2	2	2	2	2	2	
HV 100				3		2		2	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.

### 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 ms
- > 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.

### Software function:

- > **System linkage:** System - hardness tester linkage through communication interface.
- > **Pressure linkage:** When converting test force, the system perceives 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	HTV 10D / HTV 50D V2.0
Test force control	Load cell closed loop - Load electronic controlled
Load selection	PC and control panel keyboard (HV mode)
Main loads	HTV 10D V2.0: 0.3kgf, 0.5kgf, 1kgf, 2kgf, 2.5kgf, 3kgf, 5kgf, 10kgf HTV 50D V2.0: 1kgf, 2kgf, 2.5kgf, 3kgf, 5kgf, 10kgf, 20kgf, 30kgf, 50kgf
dwelt time	0~60s
Loading time	0.3kgf~5kgf: 8s, 10kgf~50kgf: 10s
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, show of the hardness value
Hardness scales	HTV 10D V2.0: HV0.3, HV0.5, HV1, HV2, HV2.5, HV3, HV5, HV10 HTV 50D V2.0: HV1, HV2, HV2.5, HV3, HV5, HV10, HV20, HV30, HV50
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	1.30 Million
Eyepiece microscope	10x
Objectives	HTV 10D V2.0: 10x, 40x HTV 50D V2.0: 10x, 20x
Optical path	2 ways eyepiece
Optical function	Optical diaphragm / field aperture / color filter
Microscope min. measuring unit	HTV 10D V2.0: 0.25µm (10x objective), 0.0625µm (40x objective) HTV 50D V2.0: 0.25µm (10x objective), 0.125µm (20x objective)
Microscope max. measurement length	HTV 10D V2.0: 800µm (10x objective), 200µm (40x objective) HTV 50D V2.0: 800µm (10x objective), 400µm (20x objective)
CCD min. measuring unit	HTV 10D V2.0: 0.1µm (10x objective), 0.025µm (40x objective) HTV 50D V2.0: 0.1µm (10x objective), 0.05µm (20x objective)
CCD max. measurement length	HTV 10D V2.0: 680µm (10x objective), 170µm (40x objective) HTV 50D V2.0: 680µm (10x objective), 340µm (20x objective)
Measurable min. indent/ indentation	10µm
Illumination	Halogen lamp
Indenters	Diamond Vickers indenter
N. of indenters	1
Nose bore diameter	6.35mm
Indent measure algorithms	Automatic
Auto reading time	0.3 sec/1 indent
Specimen detection	Yes
Movement program patterns	Zigzag, circle, arc, straight line, random, teaching etc.
Vertical test capacity	170mm
Horizontal test capacity	130mm
Anvils dimensions	Motorized cross test table, size: 110x110mm
Max. weight on anvil	50kg



Model	HTV 10D / HTV 50D V2.0
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 speed	Manual
Display type	LCD
Display dimensions	4.3"
Input mode	PC and 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	Temporary session memory: 96 tests (only tester) - PC storage (500GB)
Data output	Word, Excel format
Energy saving mode	Yes
Printer	Built-in printer   External ink jet printer
Interfaces	Machine body 1x RS232 Control box: 1x USB, 1x XY interface, 1x RS232, 1x Z interface
Safety devices	Emergency switch
Operation temperature	23±5 °C
Operation rel. humidity	≤65%
Weight	35kg
Dimensions	530x280x630mm
Power supply	230V, 50Hz
Voltage variance	±10%
Absorbed power	500W

Standard accessories		
Model	Description	Q.ty
VT-DE10x	10x digital measuring eyepiece	1 pc
VT-10XOB	10x objective (HTV 10D V2.0, HTV 50D V2.0)	1 pc
VT-20XOB	20x objective (HTV 50D V2.0)	1 pc
VT-40XOB	40x objective (HTV 10D V2.0)	1 pc
VI-136	Diamond Vickers indenter	1 pc
VT-MCTT110	Motorized cross test table 110x110mm	1 pc
HB-700800HV30	Hardness block 700-800 HV30 (HTV 50D V2.0)	1 pc
HB-700800HV10	Hardness block 700-800 HV10 (HTV 10D V2.0)	1 pc
HB-400500HV5	Hardness block 400-500 HV5 (HTV 50D V2.0)	1 pc
HB-700800HV1	Hardness block 700-800 HV1 (HTV 10D V2.0)	1 pc
VT-CCDC	CCD camera	1 set
VT-1.5XAD	1.5x adapter	1 pc
VT-JSKAX	Joystick	1 pcs
VT-MTTCB	Motorized test table control box	1 pc
VT-CNCBS	Control cables	1 pc
VT-SDUSB	USB softdog	1 pc
VT-MEASOFT	Measuring software	1 pc
VT-PCMP	Computer (Hard disk: 500Gb, memory: 2G, 19" LCD screen)	1 set
VT-PRNT	Ink jet printer	1 set
VT-RS232CBL	RS232 cable	1 pc
VT-HL1520	Halogen lamp 12V, 15-20w	1 pc
VT-4RS	Horizontal regulating screw	4 pcs
VT-LV	Spirit level	1 pc
VT-PC	Power cable	1 pc
VT-SK	Service keys	1 set
VT-ADC	Anti-dust cover	1 pc

Optional accessories	
Model	Description
VT-CTT100100	Cross test table 100x100mm
VT-DCTT120120	Digital cross test table 120x120mm
VT-FLCTT7680	Flat clamping test table 76x80mm
VT-TSTT76	Thin specimen test table ø 76mm
VT-FICTT60	Filament clamping test table ø 60mm
VT-LTT108	Large plane test table ø 108mm
VT-VTT40	V-shaped test table ø 40mm
VT-WB	Work bench
VT-APP	Additional printer paper roll

Vickers hardness blocks	
Model	Range
HB-V0.3/200-750	200-750 HV0.3 (HTV 5D V2.0, HTV 10D V2.0)
HB-V0.5/200-750	200-750 HV0.5 (HTV 5D V2.0, HTV 10D V2.0, HTV 30D V2.0)
HB-V1/200-750	200-750 HV1
HB-V2/175-750	175-750 HV2
HB-V3/175-750	175-750 HV3
HB-V5/175-750	175-750 HV5
HB-V10/175-750	175-750 HV10 (HTV 10D V2.0, HTV 30D V2.0, HTV 50D V2.0)
HB-V20/175-750	175-750 HV20 (HTV 30D V2.0, HTV 50D V2.0)
HB-V30/175-750	175-750 HV30 (HTV 30D V2.0, HTV 50D V2.0)
HB-V50/175-750	175-750 HV50 (HTV 50D V2.0)

# HTV 10DT /HTV 50DT

## Semi-Automatic Digital Vickers Hardness Tester

- > Automatic Vickers hardness tester adopts the integrated design of panel computer with Windows 7 operating system. CCD image acquisition system, show the indentation image directly on the touch screen and automatically detect the Vickers hardness value.
- > All testing parameters can be selected on the side panel computer. User friendly with touch screen.
- > CCD image acquisition system, shows the image clearly and detects the hardness value by touching the screen.
- > Automatic recognition and shifting between the objective and the indenter, automatically get the Vickers hardness value.
- > Hardness scale conversion function.
- > With USB, VGA and LAN interfaces, the hardness measurement can be print out by USB interface printer.

AUTOMATIC TURRET



- > Automatic data save, generate the hardness-depth curve and save as WORD or EXCEL document.
- > With motorized X-Y test table, automatic focusing and automatic measuring, it is the fully automation of Vickers hardness testing.

**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 E92, JIS Z2244

**Displayed value repeatability %**

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

**Displayed value tolerance %**

Hardness	Hardness HV															
	50	100	150	200	250	300	350	400	450	500	600	700	800	900	1000	1500
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	11
HV 1		3		4		4		4		5	5	5	6	6	6	8
HV 2		3		3		3		4		4	4	4	4	5	5	6
HV 3		3		3		3		3		3	4	4	4	4	4	5
HV 5		3		3		3		3		3	3	3	3	3	4	4
HV 10		3		3		3		3		3	3	3	3	3	3	3
HV 20		3		3		3		3		3	3	3	3	3	3	3
HV 30		3		3		2		2		2	2	2	2	2	2	2
HV 50		3		3		2		2		2	2	2	2	2	2	2
HV 100				3		2		2		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.



Model	HTV 10DT / HTV 50DT
Test force control	Load cell closed loop - Load electronic controlled
Load selection	Touch screen control panel
Main loads	HTV 10DT: 0.2kgf, 0.3kgf, 0.5kgf, 1kgf, 2kgf, 2.5kgf, 3kgf, 5kgf, 10kgf HTV 50DT: 0.5kgf, 1kgf, 2kgf, 2.5kgf, 3kgf, 5kgf, 10kgf, 20kgf, 30kgf, 50kgf
dwelt time	0-60s
Loading time	0.2kgf-5kgf: 8s, 10kgf-50kgf: 10s
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, show of the hardness value
Hardness scales	HTV 10DT: HV0.2, HV0.3, HV0.5, HV1, HV2, HV2.5, HV3, HV5, HV10 HTV 50DT: HV0.5, HV1, HV2, HV2.5, HV3, HV5, HV10, HV20, HV30, HV50
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	1.30 Million
Microscope Eyepiece	10X
Objectives	10x, 20x, 40x
Optical path	2 ways eyepiece
Optical function	Optical diaphragm / field aperture / color filter
Illumination	Halogen lamp
CCD min. measuring unit	0.25µm, 0.125µm, 0.0625µm
CCD max. measurement length	1.2mm, 600µm, 300µm
Measurable min. indent/indentation	0.01mm

Model	HTV 10DT / HTV 50DT
Indenters	Diamond Vickers indenter
N. of indenters	1
Nose cone support diameter	6.35mm
CCD camera Pixel	1.30 Million
Auto reading time	0.3 sec/1 indent
Indent measure algorithms	Automatic
Vertical test capacity	185mm
Horizontal test capacity	130mm
Test anvil dimensions	Digital cross test table size: 120x120mm
Max. weight on anvil	50kg
X-Y travel	25x25mm
X axis speed	Manual
X axis resolution	0.003mm
Y axis speed	Manual
Y axis resolution	0.003mm
Z axis movement	Manual
Z axis resolution	Manual
Z axis speed	Manual
Display type	Touch screen
Display dimensions	8"
Input mode	By tap touch
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	SSD 64GB
Data output	Word, Excel format
Energy saving mode	Yes
Interfaces	3x USB, 1x VGA, 1x LAN
Safety devices	Emergency switch
Operation temperature	23±5 °C
Operation rel. humidity	≤65%
Weight	48 kg
Dimensions	560x335x675mm
Power supply	230V, 50Hz
Voltage variance	±10%
Absorbed power	500W

Standard accessories		
Model	Description	Q.ty
VT-RM10X	10x reading microscope	1 pc
VT-10XOB	10x objective	1 pc
VT-20XOB	20x objective	1 pc
VT-40XOB	40x objective	1 pc
VI-136	Diamond Vickers indenter	1 pc
VT-DCTT120120	Digital cross test table 120x120mm	1 pc
HB-400500HV5	Hardness block 400-500 HV5	1 pc
HB-700800HV1	Hardness block 700-800 HV1	1 pc
VT-HL1520	Halogen lamp 12V, 15-20W	1 pc
VT-4RS	Horizontal regulating screw	4 pcs
VT-LV	Spirit level	1 pc
VT-TSRC	Touch screen remote control	1 pc
VT-TP	Touch pen	1 pc
VT-MSE	Mouse	1 pc
VT-SKUSB	USB storage key	1 pc
VT-PC	Power cable	1 pc
VT-SK	Service keys	1 set
VT-ADC	Anti-dust cover	1 pc

Optional accessories	
Model	Description
VT-FLCTT7680	Flat clamping test table 76x80mm
VT-TSTT76	Thin specimen test table ø 76mm
VT-FICTT60	Filament clamping test table ø 60mm
VT-LTT108	Large plane test table ø 108mm
VT-VTT40	V-shaped test table ø 40mm
VT-WB	Work bench
VT-EXPR	External printer
Vickers hardness blocks	
Model	Range
HB-V0.2/200-750	200-750 HV0.2 (HTV 10DT)
HB-V0.3/200-750	200-750 HV0.3 (HTV 10DT)
HB-V0.5/200-750	200-750 HV0.5
HB-V1/200-750	200-750 HV1
HB-V2/175-750	175-750 HV2
HB-V3/175-750	175-750 HV3
HB-V5/175-750	175-750 HV5
HB-V10/175-750	175-750 HV10 (HTV 10DT, HTV 50DT)
HB-V20/175-750	175-750 HV20 (HTV 50DT)
HB-V30/175-750	175-750 HV30 (HTV 50DT)
HB-V50/175-750	175-750 HV50 (HTV 50DT)

# HTV 50D

## Digital Vickers Hardness Tester

> Digital Vickers hardness tester adopts load cell control system, improves the accuracy of the test force and the repeatability of the indicating value. Equipped with color touch screen with adjustable backlight and energy-saving mode, for easier working operations. Directly shows the test force, indentation length, dwell time, test numbers, conversion scale, date and time. With digital measuring eyepiece after measuring the indentation length, the hardness value is automatically detected and shown on the screen. Test results can be saved or printed out by the built-in printer, with RS232 interface for computer connection. It can be equipped with LCD video measuring device and CCD image automatic measuring system.



MEMORY STORAGE

### 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 E92, JIS Z2244

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

Displayed value tolerance %																
Hardness	Hardness HV															
	50	100	150	200	250	300	350	400	450	500	600	700	800	900	1000	1500
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	11
HV 1		3		4		4		4		5	5	5	6	6	6	8
HV 2		3		3		3		4		4	4	4	4	5	5	6
HV 3		3		3		3		3		3	4	4	4	4	4	5
HV 5		3		3		3		3		3	3	3	3	3	4	4
HV 10		3		3		3		3		3	3	3	3	3	3	3
HV 20		3		3		3		3		3	3	3	3	3	3	3
HV 30		3		3		2		2		2	2	2	2	2	2	2
HV 50		3		3		2		2		2	2	2	2	2	2	2
HV 100				3		2		2		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.



Model	HTV 50D
Test force control	Load cell closed loop - Load electronic controlled
Load selection	Touch screen
Main loads	1kgf, 2kgf, 2.5kgf, 3kgf, 5kgf, 10kgf, 20kgf, 30kgf, 50kgf
dwell time	0~60s
Loading time	0.3kgf-5kgf: 8s, 10kgf-50kgf: 10s
Load applying speed (indenter descending speed)	0.04mm/s
Test force tolerance	±1%
Test cycle type	Semi-automatic type: Manual - focus, measure of indentation Automatic - load, dwell, unload, show of the hardness value (after measure step)
Hardness scales	HV1, HV2, HV2.5, HV3, HV5, HV10, HV20, HV30, HV50
Hardness test range	1HV~2967HV
Hardness resolution	0.1HV
Repeatability hef/%	Table 1
Scale conversion	HK, HRA, HRB, HRC, HRD, HRE, HRF, HRG, HRK, HR15N, HR30N, HR45N, HR15T, HR30T, HR45T, HS, HB - According to ASTM E140
Turret type	Automatic
Microscope eyepiece	10x
Objectives	10x, 20x
Microscope min. measuring unit	0.25µm (10x objective) - 0.125µm (20x objective)
Microscope max. measurement length	800µm (10x objective) - 400µm (20x objective)
Measurable min. indent/indentation	10µm
Optical path	2 ways eyepiece
Illumination	Halogen lamp

Model	HTV 50D
Indenters	Diamond Vickers indenter
N. of indenters	1
Nose cone support diameter	6.35mm
Vertical test capacity	170mm
Horizontal test capacity	130mm
Anvils dimensions	Large plane test table, size: ø 108mm, V-shaped, size: ø 40mm
Max. weight on anvil	Large plane test table ø 108mm, V-shaped test table ø 40mm: 100kg
Z axis movement	Manual
Z axis speed	Manual
Display type	LCD touch screen
Digital dimensions	5.6"
Input mode	By tap touch
Displayed data	Hardness value, D1, D2, dwell time, test number, conversion scale, test force, date and time, light, objective
Statistics or functions	Max, min, average value
Data storage	Temporary session memory (192 tests)
Data output	Hyperterminal session format (.HT)
Energy saving mode	Yes
Printer	Built-in printer
Interfaces	1x RS232
Safety devices	Emergency switch
Operation temperature	23±5 °C
Operation rel. humidity	≤65%
Weight	35kg
Dimensions	530x280x630mm
Power supply	230V, 50Hz
Voltage variance	±10%
Absorbed power	500W

**Standard accessories**

Model	Description	Q.ty
VT-DE10x	10x digital measuring eyepiece	1 pc
VT-10XOB	10x objective	1 pc
VT-20XOB	20x objective	1 pc
VI-136	Diamond Vickers indenter	1 pc
VT-LTT108	Large plane test table ø 108mm	1 pc
VT-VTT40	V-shaped test table ø 40mm	1 pc
HB-700800HV30	Hardness block 700-800 HV30	1 pc
HB-400500HV5	Hardness block 400-500 HV5	1 pc
VT-HL1520	Halogen lamp 12V, 15-20W	1 pc
VT-4RS	Horizontal regulating screw	4 pcs
VT-LV	Spirit level	1 pc
VT-PC	Power cable	1 pc
VT-SK	Service keys	1 pc
VT-ADC	Anti-dust cover	1 pc

**Optional accessories**

Model	Description
VT-CTT100100	Cross test table 100x100mm
VT-DCTT120120	Digital cross test table 120x120mm
VT-FLCTT7680	Flat clamping test table 76x80mm
VT-TSTT76	Thin specimen test table ø 76mm
VT-FICTT60	Filament clamping test table ø 60mm
VT-CCDMS	CCD measuring system
VT-LCDMD	LCD measuring device
VT-WB	Work bench
VT-APP	Additional printer paper roll

**Vickers hardness blocks**

Model	Range
HB-V1/200-750	200-750 HV1
HB-V2/175-750	175-750 HV2
HB-V3/175-750	175-750 HV3
HB-V5/175-750	175-750 HV5
HB-V10/175-750	175-750 HV10
HB-V20/175-750	175-750 HV20
HB-V30/175-750	175-750 HV30
HB-V50/175-750	175-750 HV50

# HTV 10D

## Digital Vickers Hardness Tester

> Digital Vickers hardness tester adopts load cell control system, improves the accuracy of the test force and the repeatability of the indicating value. Equipped with color touch screen with adjustable backlight and energy-saving mode, for easier working operations. Directly shows the test force, indentation length, dwell time, test numbers, conversion scale, date and time. With digital measuring eyepiece after measuring the indentation length, the hardness value is automatically detected and shown on the screen. Test results can be saved or printed out by the built-in printer, with RS232 interface for computer connection. It can be equipped with LCD video measuring device and CCD image automatic measuring system.



### Application

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

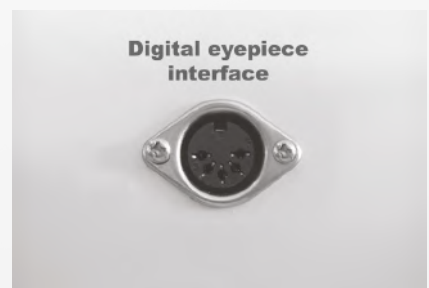
### Reference standard

> ISO 6507, ASTM E92, JIS Z2244

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

Displayed value tolerance %																
Hardness	Hardness HV															
	50	100	150	200	250	300	350	400	450	500	600	700	800	900	1000	1500
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	11
HV 1		3		4		4		4		5	5	5	6	6	6	8
HV 2		3		3		3		4		4	4	4	4	5	5	6
HV 3		3		3		3		3		3	4	4	4	4	4	5
HV 5		3		3		3		3		3	3	3	3	3	4	4
HV 10		3		3		3		3		3	3	3	3	3	3	3
HV 20		3		3		3		3		3	3	3	3	3	3	3
HV 30		3		3		2		2		2	2	2	2	2	2	2
HV 50		3		3		2		2		2	2	2	2	2	2	2
HV 100				3		2		2		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.



Model	HTV 10D
Test force control	Load cell closed loop - Load electronic controlled
Load selection	Touch screen
Main loads	0.3kgf, 0.5kgf, 1kgf, 2kgf, 2.5kgf, 3kgf, 5kgf, 10kgf
dwelt time	0~60s
Loading time	0.3kgf~5kgf: 8s, 10kgf~50kgf: 10s
Load applying speed (indenter descending speed)	0.04mm/s
Test force tolerance	±1%
Test cycle type	Semi-automatic type: manual - focus, measure of indentation Automatic - load, dwell, unload, show of the hardness value (after measure step)
Hardness scales	HV0.3, HV0.5, HV1, HV2, HV2.5, HV3, HV5, HV10
Hardness test range	1HV~2967HV
Hardness resolution	0.1HV
Accuracy: Repeatability heff/%	Table 1
Scale conversion	HK, HRA, HRB, HRC, HRD, HRE, HRF, HRG, HRK, HR15N, HR30N, HR45N, HR15T, HR30T, HR45T, HS, HB - According to ASTM E140
Turret type	Automatic
Microscope eyepiece	10x
Objectives	10x, 40x
Microscope min. measuring unit	10x 0.25µm - 40x 0.0625µm
Microscope max. measurement length	10x 800µm - 40x 200µm
Measurable min. indent/indentation	10µm
Optical path	2 ways eyepiece
Illumination	Halogen lamp
Indenters	Diamond Vickers indenter
N. of indenters	1
Nose cone support diameter	6.35mm
Vertical test capacity	170mm
Horizontal test capacity	130mm
Anvils dimensions	Cross test table, size: 100x100mm
Max. weight on anvil	10kg
X-Y travel	25x25mm
X axis speed	Manual
X axis resolution	0.01mm
Y axis speed	Manual
Y axis resolution	0.01mm
Z axis movement	Manual
Z axis speed	Manual
Display type	LCD touch screen
Display dimensions	5.6"
Input mode	By tap touch
Displayed data	Hardness value, D1, D2, dwell time, test number, conversion scale, test force, date and time, light, objective
Statistics or functions	Max, min, average value
Data storage	Temporary session memory, 96 tests
Data output	Hyperterminal format session file (.HT)
Energy saving mode	Yes
Printer	Built-in printer
Interfaces	1x RS232
Safety devices	Emergency switch
Operation temperature	23±5 °C
Operation rel. humidity	≤65%
Weight	35kg
Dimensions	530x280x630mm
Power supply	230V, 50Hz
Voltage variance	±10%
Absorbed power	500W

**Standard accessories**

Model	Description	Q.ty
VT-DE10x	10x digital measuring eyepiece	1 pc
VT-10XOB	10x objective	1 pc
VT-40XOB	40x objective	1 pc
VI-136	Diamond Vickers indenter	1 pc
VT-CTT100100	Cross test table 100x100mm	1 pc
HB-700800HV1	Hardness block 700-800 HV1	1 pc
HB-700800HV10	Hardness block 700-800 HV10	1 pc
VT-HL1520	Halogen lamp 12V, 15-20W	1 pc
VT-4RS	Horizontal regulating screw	4 pcs
VT-LV	Spirit level	1 pc
VT-PC	Power cable	1 pc
VT-SK	Service keys	1 set
VT-ADC	Anti-dust cover	1 pc

**Optional accessories**

Model	Description
VT-DCTT120120	Digital cross test table 120x120mm
VT-FLCTT7680	Flat clamping test table 76x80mm
VT-TSTT76	Thin specimen test table ø76mm
VT-FICTT60	Filament clamping test table ø 60mm
VT-LTT108	Large test table ø 108mm
VT-VTT40	V-shaped test table ø 40mm
VT-CCDMS	CCD measuring system
VT-LCDMD	LCD measuring device
VT-WB	Work bench
VT-APP	Additional printer paper roll

**Vickers hardness blocks**

Model	Range
HB-V0.3/200-750	200-750 HV0.3
HB-V0.5/200-750	200-750 HV0.5
HB-V1/200-750	200-750 HV1
HB-V2/175-750	175-750 HV2
HB-V3/175-750	175-750 HV3
HB-V5/175-750	175-750 HV5
HB-V10/175-750	175-750 HV10

# HTV 50Z

## Digital Vickers Hardness Tester

> Digital Vickers Hardness Tester adopts load cell control system, improves the accuracy of the test force and the repeatability of the indicating value. Directly shows the test force, indentation length, dwell time, test numbers, conversion scale, date and time. With digital measuring eyepiece after measuring the indentation length, the hardness value is automatically detected and shown on the screen. P Type: built-in printer, Z Type: automatic turret shifting and built-in printer. It can be equipped with LCD video measuring device and CCD image automatic measuring system.



AUTOMATIC TURRET

### Application

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

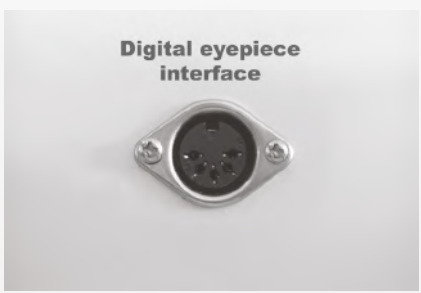
### Reference standard

> ISO 6507, ASTM E92, JIS Z2244

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

Displayed value tolerance %																
Hardness	Hardness HV															
	50	100	150	200	250	300	350	400	450	500	600	700	800	900	1000	1500
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	11
HV 1		3		4		4		4		5	5	5	6	6	6	8
HV 2		3		3		3		4		4	4	4	4	5	5	6
HV 3		3		3		3		3		3	4	4	4	4	4	5
HV 5		3		3		3		3		3	3	3	3	3	4	4
HV 10		3		3		3		3		3	3	3	3	3	3	3
HV 20		3		3		3		3		3	3	3	3	3	3	3
HV 30		3		3		2		2		2	2	2	2	2	2	2
HV 50		3		3		2		2		2	2	2	2	2	2	2
HV 100				3		2		2		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.





Model	HTV 50Z
Test force control	Load cell closed loop - Load electronic controlled
Load selection	Control panel keyboard
Main loads	1kgf, 2kgf, 2.5kgf, 3kgf, 5kgf, 10kgf, 20kgf, 30kgf, 50kgf
dwelt time	0-60s
Loading time	0.3kgf-5kgf: 8s, 10kgf-50kgf: 10s
Load applying speed	0.04mm/s
Test force tolerance	±1%
Test cycle type	Semi-automatic type: manual - focus, measure of indentation Automatic - load, dwell, unload, show of the hardness value (after measure step)
Hardness scales	HV1, HV2, HV2.5, HV3, HV5, HV10, HV20, HV30, HV50
Hardness test range	1HV-2967HV
Hardness resolution	0.1HV
Repeatability hef/%	Table 1
Scale conversions	With table, according to ASTM E140
Turret type	Automatic
Microscope eyepiece	10x
Objectives	10x, 20x
Microscope min. measuring unit	0.25µm (10x objective) - 0.125µm (20x objective)
Microscope max. measurement length	800µm (10x objective) - 400µm (20x objective)
Measurable min. indent/indentation	400µm (20x objective)
Optical path	2 ways eyepiece
Illumination	Halogen lamp
Indenters	Diamond Vickers indenter
N. of indenters	1
Nose bore diameter	6.35mm
Vertical test capacity	170mm
Horizontal test capacity	130mm
Anvils dimensions	Large plane test table, size: ø 108mm, V-shaped, size: ø 40mm
Max. weight on anvil	100kg
Z axis movement	Manual
Z axis speed	Manual
Display type	LCD
Display dimensions	3"
Input mode	Control panel keyboard
Displayed data	Hardness value, D1, D2, test force, dwell time, test number
Data output	Hyperterminal session format (.HT)
Energy saving mode	Yes
Printer	Built-in printer
Interfaces	1xRS232
Safety devices	Emergency switch
Operation temperature	23±5 °C
Operation rel. humidity	≤65%
Weight	35kg
Dimensions	530x280x630mm
Power supply	230V, 50Hz
Voltage variance	±10%
Absorbed power	500W

Standard accessories		
Model	Description	Q.ty
VT-DE10x	10x digital measuring eyepiece	1 pc
VT-10XOB	10x objective	1 pc
VT-20XOB	20x objective	1 pc
VI-136	Diamond Vickers indenter	1 pc
VT-LTT108	Large plane test table ø 108mm	1 pc
VT-VTT40	V-shaped test table ø 40mm	1 pc
HB-700800HV30	Hardness block 700-800 HV30	1 pc
HB-400500HV5	Hardness block 400-500 HV5	1 pc
VT-HL1520	Halogen lamp 12V, 15-20W	1 pc
VT-4RS	Horizontal regulating screw	4 pcs
VT-LV	Spirit level	1 pc
VT-PC	Power cable	1 pc
VT-SK	Service keys	1 set
VT-ADC	Anti-dust cover	1 pc

Optional accessories	
Model	Description
VT-CTT100100	Cross test table 100x100mm
VT-DCTT120120	Digital cross test table 120x120mm
VT-FLCTT7680	Flat clamping test table 76x80mm
VT-TSTTT76	Thin specimen test table ø76mm
VT-FICTT60	Filament clamping test table ø 60mm
VT-CCDMS	CCD measuring system
VT-LCDMD	LCD measuring device
VT-WB	Work bench
VT-APP	Additional printer paper roll
Vickers hardness blocks	
Model	Range
HB-V0.5/200-750	200-750 HV0.5
HB-V1/200-750	200-750 HV1
HB-V2/175-750	175-750 HV2
HB-V3/175-750	175-750 HV3
HB-V5/175-750	175-750 HV5
HB-V10/175-750	175-750 HV10
HB-V20/175-750	175-750 HV20
HB-V30/175-750	175-750 HV30
HB-V50/175-750	175-750 HV50

# HTV 10Z

## Digital Vickers Hardness tester

> Digital Vickers Hardness Tester adopts load cell control system, improves the accuracy of the test force and the repeatability of the indicating value. Directly shows the test force, indentation length, dwell time, test numbers, conversion scale, date and time. With digital measuring eyepiece after measuring the indentation length, the hardness value is automatically detected and shown on the screen. P Type: built-in printer, Z Type: automatic turret shifting and built-in printer. It can be equipped with LCD video measuring device and CCD image automatic measuring system.



### Application

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

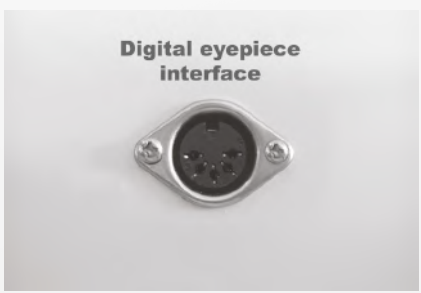
### Reference standard

> ISO 6507, ASTM E92, JIS Z2244

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

Displayed value tolerance %																
Hardness	Hardness HV															
	50	100	150	200	250	300	350	400	450	500	600	700	800	900	1000	1500
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	11
HV 1		3		4		4		4		5	5	5	6	6	6	8
HV 2		3		3		3		4		4	4	4	4	5	5	6
HV 3		3		3		3		3		3	4	4	4	4	4	5
HV 5		3		3		3		3		3	3	3	3	3	4	4
HV 10		3		3		3		3		3	3	3	3	3	3	3
HV 20		3		3		3		3		3	3	3	3	3	3	3
HV 30		3		3		2		2		2	2	2	2	2	2	2
HV 50		3		3		2		2		2	2	2	2	2	2	2
HV 100				3		2		2		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.



Model	HTV 10Z
Test force control	Load cell closed loop - Load electronic controlled
Load selection	Control panel keyboard
Main loads	0.3kgf, 0.5kgf, 1kgf, 2kgf, 2.5kgf, 3kgf, 5kgf, 10kgf
dwelt time	0~60s
Loading time	0.3kgf~5kgf: 8s 10kgf~50kgf: 10s
Load applying speed(indenter descending speed)	0.04mm/s
Test force tolerance	±1%
Test cycle type	Semi-automatic type: manual - focus, measure of indentation Automatic - load, dwell, unload, show of the hardness value (after measure step)
Hardness scales	HV0.3, HV0.5, HV1, HV2, HV2.5, HV3, HV5, HV10
Hardness test range	1HV~2967HV
Hardness resolution	0.1HV
Repeatability hef/%	Table 1
Scale conversion	With table, according to ASTM E140
Turret type	Automatic
Microscope eyepiece	10x
Objectives	10x, 40x
Microscope min. measuring unit	0.25µm (10x objective) - 0.0625µm (40x objective)
Microscope max. measurement length	800µm (10x objective) - 200µm (40x objective)
Measurable min. indent/indentation	10µm
Optical path	2 ways eyepiece
Illumination	Halogen lamp
Indenters	Diamond Vickers indenter
N. of indenters	1
Nose bore diameter	6.35mm
Vertical test capacity	170mm
Horizontal test capacity	130mm
Anvils dimensions	Cross test table, size: 100x100mm
Max. weight on anvil	10kg
X-Y travel	25x25mm
X axis speed	Manual
X axis resolution	0.01mm
Y axis speed	Manual
Y axis resolution	0.01mm
Z axis movement	Manual
Z axis speed	Manual
Display type	LCD
Display dimensions	3"
Input mode	Control panel keyboard
Displayed data	Hardness value, D1, D2, test force, dwell time, test number
Data output	Hyperterminal session format (.HT)
Energy saving mode	Yes
Printer	Built-in printer
Interfaces	1xRS232
Safety devices	Emergency switch
Operation temperature	23±5 °C
Operation rel. humidity	≤65%
Weight	35kg
Dimensions	530x280x630mm
Power supply	230V, 50Hz
Absorbed power	500W

Standard accessories		
Model	Description	Q.ty
VT-DE10x	10x digital measuring eyepiece	1 pc
VT-10XOB	10x objective	1 pc
VT-40XOB	40x objective	1 pc
VI-136	Diamond Vickers indenter	1 pc
VT-CTT100100	Cross test table 100x100mm	1 pc
HB-700800HV10	Hardness block 700-800 HV10	1 pc
HB-700800HV1	Hardness block 700-800 HV1	1 pc
VT-HL1520	Halogen lamp 12V, 15-20W	1 pc
VT-4RS	Horizontal regulating screw	4 pcs
VT-LV	Spirit level	1 pc
VT-PC	Power cable	1 pc
VT-SK	Service keys	1 set
VT-ADC	Anti-dust cover	1 pc

Optional accessories	
Model	Description
VT-DCTT120120	Digital cross test table 120x120mm
VT-FLCTT7680	Flat clamping test table 76x80mm
VT-TSTT76	Thin specimen test table ø76mm
VT-FICTT60	Filament clamping test table ø 60mm
VT-LTT108	Large test table ø 108mm
VT-VTT40	V-shaped test table ø 40mm
VT-CCDMS	CCD measuring system
VT-LCDMD	LCD measuring device
VT-WB	Work bench
VT-APP	Additional printer paper roll
Vickers hardness blocks	
Model	Range
HB-V0.3/200-750	200-750 HV0.3
HB-V0.5/200-750	200-750 HV0.5
HB-V1/200-750	200-750 HV1
HB-V2/175-750	175-750 HV2
HB-V3/175-750	175-750 HV3
HB-V5/175-750	175-750 HV5
HB-V10/175-750	175-750 HV10



**LCD Video  
Measuring device**



**LCD Video measuring device**

**Main Function:**

LCD Video measuring device is composed by video measuring device, 8" color LCD monitor and connections components. With this device, the indentation can be directly showed on the monitor.


The measurement is more accurate. Avoids visual fatigue and human-made error, increasing working efficiency.

**Standard Configuration:**


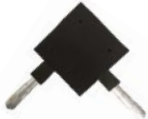




1. 8" Color LCD monitor
2. Video measuring device
3. Video connection cable

## Macro Vickers Accessories



### Indenters

Code	Description	
VI-136	Diamond Vickers indenter	

### Test tables

Code	Description	
VT-DCTT120120	Digital cross test table 120x120mm	
VT-CTT100100	Cross test table 100x100mm	
VT-FLCTT7680	Flat clamping test table 76x80mm	
VT-TSTT76	Thin specimen test table ø 76mm	
VT-FICTT60	Filament clamping test table ø 60mm	
VT-LTT108	Large test table ø 108mm	
VT-VTT40	V-shaped test table ø 40mm	

### Additional options

Code	Description	
VT-WB	Work bench	
VT-APP	Additional printer paper roll	

### Hardness blocks

Code	Scale	Range
HB-V0.2/200-750	HV0.2	200-750
HB-V0.3/200-750	HV0.3	200-750
HB-V0.5/200-750	HV0.5	200-750
HB-V1/200-750	HV1	200-750
HB-V2/175-750	HV2	175-750
HB-V3/175-750	HV3	175-750
HB-V5/175-750	HV5	175-750
HB-V10/175-750	HV10	175-750
HB-V20/175-750	HV20	175-750
HB-V30/175-750	HV30	175-750
HB-V50/175-750	HV50	175-750