FULLY-AUTOMATIC HARDNESS TESTING SYSTEM

ARS10K

FUTURE-TECH CORP.

Multi-Functional mechanism is united with high operability! ARS AUTOMATIC SYSTEM is noticeably improved!

XY-stage control

By "Drag & Drop" on the monitor screen, the XY-stage can be moved and, by the scroll button operation, the Z-stage can be moved. You can control the XYZ-stage easily by mouse operation as you wish. (e.g. positioning the sample origin) Workability of complicated work is improved. *1

It is possible to control the XYZ-stage by using the joy-stick which is supplied as option.

stage movement method
Drag and Drop
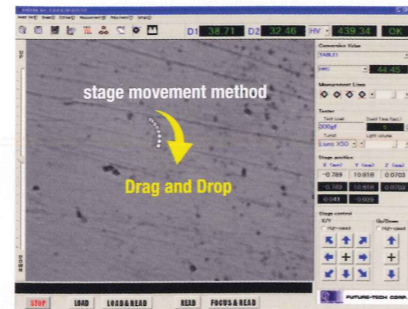
*1 By Drag & Drop, it is possible to move the stage!

Indentation measurement

● A high-resolution CMOS camera of 1,300,000 pixels is adopted.
By the wide-area display and high resolution, the reading accuracy is improved remarkably.

● The indentation shape recognition image processing is adopted. This function removes other objects except an indentation. So, the high-precision automatic measurement is realized even on a scratched, stained or etched surface.

● It is possible to display a wide area in miniature and an indentation edge in a large size. In manual indentation measurement, fine adjustment can be easily and precisely performed.
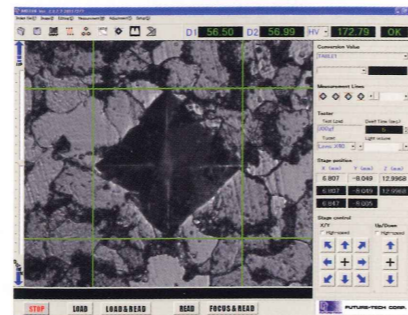
Measurement image for etching surface

Data editing

● The data of various condition settings can be retrieved. (Search function)
For the retrieved data, it is possible to re-measure and do the correction.

● By clicking the point of the probable abnormal value on the graph, the stage shall move to that point.
It is possible to correct the data by re-measuring.

● According to the measurement data, the depth of the hardened layer or all the hardened layers is calculated and displayed. (Nht, Rht) It is possible to calculate the limit hardness from the measurement data.
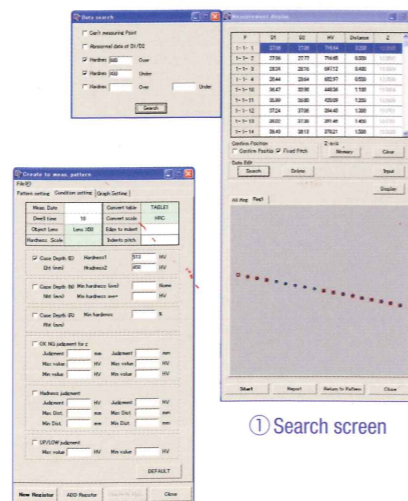
① Search screen

② Condition setting screen

Pattern setting

● Two types of shape recognition functions are adopted. One is sample edge recognition and the other is inside area recognition.

● 8 patterns as one set can be registered up to 10 sets. Up to 80 patterns can be set at the same time.

● Not only the pattern but also the measuring lens, test load and other test conditions can be saved and registered at the same time. This function prevents a wrong test condition.

● Pattern coordinate values can be inserted, cut, copied and pasted. Pattern is easily corrected and added.

● Synchronization setting: this function enables to set the start position of plural lines for the same shape samples at the same time. *2

● By clicking the origin position on the screen, it is automatically set in 90° from the sample edge reference line. *3

● The line setting angle and the sample edge reference line can be easily changed by "Drag & Drop" or entering a value in the chart.

● In the case of graph setting, pattern can be made by clicking the graph coordinate values. A complex pattern can be easily set up. *4

● ARS 10K SYSTEM recognizes the inclination of the sample surface automatically by registering 3 points of the XYZ coordinates. During automatic operation, XY and Z-axis are under controlled.

Synchronization setting
Drag and Drop
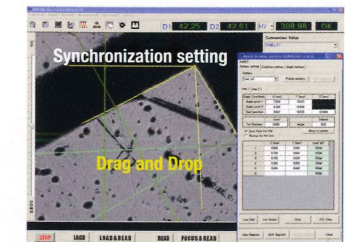
*2 Synchronization setting of plural lines can be done!

Automatic direction setting
Double-click origin.

*3 Origin position angle can be automatically set!

Pattern graph setting
Double-click on graph.
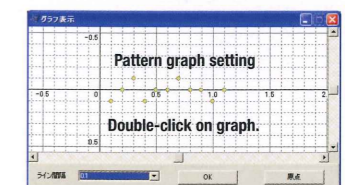
*4 Because of pattern graph setting, it is not necessary to enter a value!

Results of measurement

By using the report making tool, it is possible to make and save a desirable test result report. You can access and use this tool according to the need.

HARDNESS TEST DATA
Sample
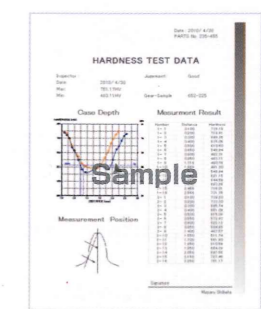
Other functions

In the case of tool function, clicking 2 points enables to measure the length and clicking 3 points enables to measure the length and angle.
It is possible to save the measurement data in CSV file.
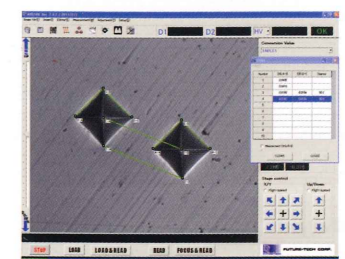
Tool Function

FULLY-AUTOMATIC SYSTEM SPECIFICATIONS

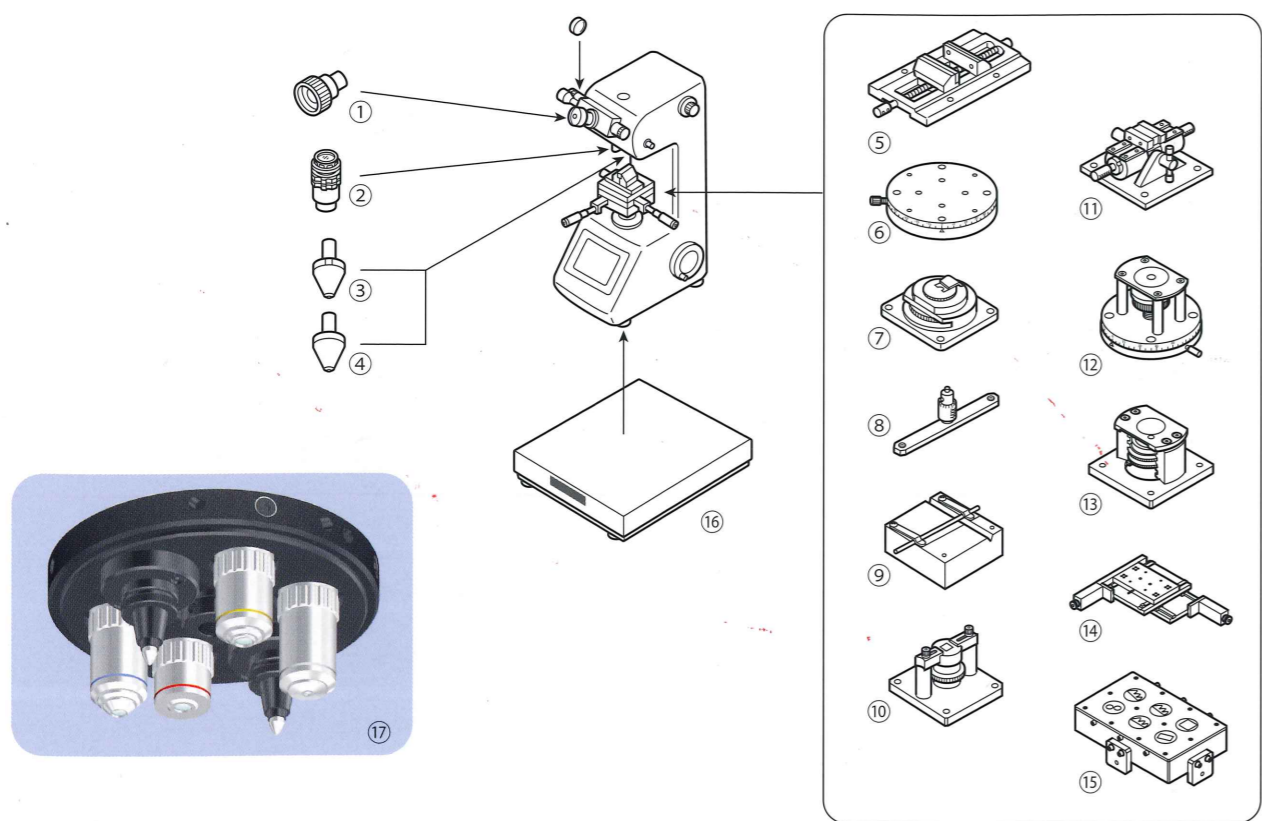| ITEM		FULLY-AUTOMATIC MICROHARDNESS TESTING SYSTEM **FM-ARS10K**	FULLY-AUTOMATIC VICKERS HARDNESS TESTING SYSTEM **FV-ARS10K**
HARDNESS TESTER		Analog Microhardness Tester FM-100s (OPTION:FM-300s, FM-800s available)	Analog Vickers Hardness Tester FV-100s (OPTION:FV-300s, FV-800s available)
STANDARD SYSTEM COMPONENT		CMOS 1.3M Pixel, Automatic X-Y Stage & Motor Drive Unit, CCD Camera ,Complete set of PC:17"Color CRT, Mouse, Keyboard, Controller, ※ OPTION: Joy-Stick	
		Standard Software for System ARS 10K, Ink-Jet Type Color Printer, PC: DELL or IBM Compatible Model with OS Windows XP or Windows7	
HARDNESS TESTER	FOCUS OPERATION	Automatic/Manual Operation available	
	LOADING MECHANISM	Automatic Load/Hold/Rlease Method	
	TEST LOAD	A type: mN: 98.07 ～ 9807 (gf:10 ～ 1000) B type: mN: 49.03 ～ 4903 (gf:5 ～ 500) C type: mN: 245.2 ～ 19614 (gf:25 ～ 2000) D type: mN: 9.807 ～ 19614 (gf:1 ～ 2000)	A type: N: 9.807 ～ 490.3 (kgf:1 ～ 50) B type: N: 0.942 ～ 294.2 (kgf:0.3 ～ 30)
	AUTO-STAGE ELEVATION	Automatic : by Built-in stepping Motor, Manual Standard Handle *Safety Devices equipped to Overrun of Elevation. (OPTION : Joy-stick)	
	PRECISION VISE	Standard :Max. Opening :50mm	
	TURRET ROTATION	Automatic/Manual changeable	
	LOAD APPLYING SPEED	Initial Speed:120um/sec / Actual Loading Speed: 60um/sec	
	DWELL TIME	5-40sec	
	OBJECT LENS	× 10/ × 50 (Optical Parts for 3rd Lens Built-in)	× 10 (A type), 10/ × 20 (B type) (Optical Parts for 3rd Lens Built-in)
	MEASUREMENT SCALE	Vickers Hardness(HV)/Knoop Hardness(HK)	
X-Y STAGE	DRIVING MOTOR	Stepping Motor By AICON: 2 Steps Speed available in X・Y axis, By Mouse: Flexible Speed Changing in X・Y・Z axis	
	DIMENSIONS	110 × 110 mm	
	MOVEMENT	MAX.50 × 50mm in X・Y axis MIN. movement.1um SPEED: 1-25mm/sec adjustable	
	PROGRAM PATTERN	Straight Line(Horizontal & Vertical) / Zigzag /Circle /Arc/Line Set for any Angle(8 Lines x 10 Registration)/ Random / Teaching /Matrix /Specificity of 2 Point /Specificity of AngleSample Profile Memory Function & Measurement along with Profile Line etc...	
	PATTERN SETTING	Measurement Point, Start Point, Finish Point, Measurement Pitch etc. shall be set by mouse click.	
AUTOMATIC READING	PC	OS : Microsoft Windows XP or Windows7	
	CAMERA	1/2 CMOS 1.3M Pixel	
	HARDNESS SCALE	Vickers(HV) / Knoop(HK)	
	REPEATABILITY	± 0.8% (Test Block 700HV/500gf , 800HV/10kgf)	
	AUTO MEASUREMENT	MEASURABLE MIN.INDENT: 5um (Min unit. 0.1 μ m) READING TIME : 0.3sec	
	MANUAL MEASUREMENT	Video Line on CRT or (OPTION ; Measuring Microscope)	
	LANGUAGES	English, Chinese, Korean, Japanese	
OTHERS	PRINTER	Standard: Color Ink-Jet Type	
	JOY-STICK	OPTION (For X・Y・Z axis Movement / Standard : Digital Type)	
	SAFETY DEVICE	Safety Devices equipped for Unmanned Operation *Turrent Rotation stop instantaneously in case of Object Lens or Indenter hit a Specimen. *Upper& Lower Limit Stopper are equipped against Uncontrollable Stage Elevation.	

AUTOMATED SYSTEM SPECIFICATIONS
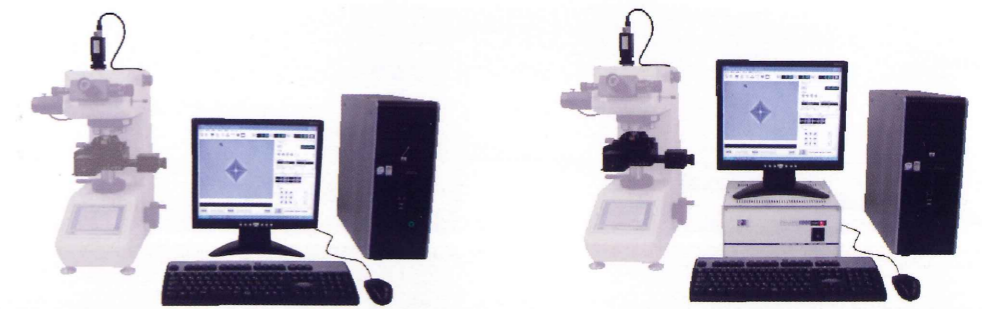
ITEM		AUTOMATIC INDENTATION MEASURING SYSTEM **AR1K**	AUTOMATIC INDENTATION MEASUREMENT/AUTOMATIC X-Y STAGE SYSTEM **ARS1K**
HARDNESS TESTER		Optional accessories Applicable models: ● FM-100 ● FM-100e ● FM-300 ● FM-300e ● FM-700 ● FM-700e ● FV-100 ● FV-100e ● FV-300 ● FV-300e ● FV-700 ● FV-700e ● DVK-1 ● DVK-2 ● MXT-30 ● MXT-70 etc.	Optional accessories Applicable models: ● FM-300 ● FM-300e ● FM-700 ● FM-700e ● FV-300 ● FV-300e ● FV-700 ● FV-700e ● DVK-1 ● DVK-2 ● MXT-30 ● MXT-70 etc.
STANDARD SYSTEM COMPONENT		CMOS 1.3M Pixel, PC:17"Color CRT	CMOS 1.3M Pixel, Automatic X-Y Stage & Motor Drive Unit, PC:17"Color CRT
		Standard Software for Automatic System, Ink-Jet Type Color Printer, PC: DELL or IBM Compatible Model with OS Windows XP or Windows7	
HARDNESS TESTER	FOCUS OPERATION	Manual	
	LOADING MECHANISM		
	TEST LOAD		
	AUTO-STAGE ELEVATION	Optional accessories Optional accessories will be combined with the relevant models as mentioned above. For the hardness tester specification, refer to Microhardness Tester FM series and Vickers Hardness Tester FV series.	
	PRECISION VISE		
	TURRET ROTATION		
	LOAD APPLYING SPEED		
	DWELL TIME		
	OBJECT LENS		
	MEASUREMENT SCALE		
X-Y STAGE	DRIVING MOTOR	—	Stepping Motor By AICON: 2 Steps Speed available in X・Y axis, By Mouse: Flexible Speed Changing in X・Y・Z axis
	DIMENSIONS	—	110 × 110 mm
	MOVEMENT	—	MAX.50 × 50mm in X・Y axis MIN Moving.1um / SPEED: 1-25mm/sec adjustable
	PROGRAM PATTERN	—	Straight Line(Horizontal & Vertical) / Zigzag /Circle /Arc/Line Set for any Angle(8 Lines x 10 Registration)/Random / Teaching / Matrix /Specificity of 2 Point /Specificity of AngleSample Profile Memory Function & Measurement along with Profile Line etc...
AUTOMATIC READING	PATTERN SETTING	Measurement Point, Start Point, Finish Point, Measurement Pitch etc. shall be set by mouse click.	
	PC	OS : Microsoft Windows XP or Windows7	
	CAMERA	1/2 CMOS 1.3M Pixel	
	HARDNESS SCALE	Vickers(HV) / Knoop(HK)	
	REPEATABILITY	± 0.8% (Test Block 700HV/500gf , 800HV/10kgf)	
	AUTO MEASUREMENT	MEASURABLE MIN.INDENT: 5um (Min unit. 0.1 μ m) READING TIME : 0.3sec	
	MANUAL MEASUREMENT	Video Line on CRT or (OPTION : Occular)	
	LANGUAGES	English, Chinese, Korean, Japanese	
OTHERS	PRINTER	Standard: Color Ink-Jet Type	
	JOY-STICK	—	—
	SAFETY DEVICE	—	—

OPTIONAL ACCESSORIES

CODE No.	ITEM			DESCRIPTION
M-062	EYEPIECE		①	× 15
M-015	OBJECT LENS		②	× 100
M-016				× 40
M-017				× 20
M-019				× 5
M-014	KNOOP INDENTER		③	Rhombic diamond indenter for Knoop hardness
M-063	BRINELL TEST	TUNGSTEN CARBIDE BALL INDENTER	④	φ 1mm
M-065	DUAL INDENTER TURRET		⑤	Specially designed turret could be available for adapting two indenters (HV + HK) simultaneously. Impossible to change a Single Indenter Turret to Dual Indenter Turret at customer's site. Please indicate when ordering.
M-028	PRECISION VISE		⑥	Max. opening : 100mm
M-029	ROTARY TABLE		⑦	Graduation of rotary angle : 5 degree Table diameter : φ 128mm
M-030	THIN SPECIMEN MEASURING DEVICE		⑧	Specimen thickness : 5mm max.
M-031	FINE SPECIMEN MEASURING DEVICE	VERTICAL TYPE	⑨	Specimen diameter : φ 5mm max. (For measuring the cross section)
M-032		HORIZONTAL TYPE	⑩	Specimen diameter : φ 5mm max. (For measuring the cylindrical surface)
M-033	SPECIMEN INCLINING DEVICE		⑪	Specimen height : 5 ~ 20mm (For mounted specimen)
M-034	UNIVERSAL INCLINING VISE		⑫	Inclining device + Vise Max. opening : 45mm
			⑬	
			⑭	
			⑮	
			⑯	
M-043	VIBRATION INSULATION STAND		⑰	MAGMATE-FT (Magnet floating type) / AIRMATE-FT (Air & Rubber type)

STANDARD ACCESSORIES

| ITEM	FULLY-AUTOMATIC MICROHARDNESS TESTING SYSTEM **FM-ARS10K**			FULLY-AUTOMATIC VICKERS HARDNESS TESTING SYSTEM **FV-ARS10K**		
MODEL	CODE NO.	SPECIFICATIONS	NO.	CODE NO.	SPECIFICATIONS	NO.
STANDARD TEST BLOCK	M-037	700HMV	1	V-039	800HV	1
PRECISION VISE	M-027	Max. Opening:50mm	1	V-027	Max. Opening:50mm	1
DIAMOND INDENTER (BUILT-IN)	M-013	For Vickers(HV)	1	V-013	For Vickers(HV)	1
OBJECT LENS (BUILT-IN)	M-061	X 50	1	V-017	X 20 (for type B)	1
	M-018	X 10	1	V-018	X 10	1
LEVEL ADJUSTING LEG	M-052	For Hardness Tester	4	V-053	For Hardness Tester	4
LEVEL	M-066		1			–
INDENTER COVER (BUILT-IN)	M-053		1	V-054		1
INDENTER SHAFT FIXTURE (BUILT-IN)			–		For Transportation	1
SPARE LIGHT SOURCE BULB	M-044	6V18W	2	V-045	6V18W	2
CAMERA MOUNTING TUBE	M-054	For adapting CCD Camera	1	V-055	For adapting CCD Camera	1
MACHINE COVER	M-055	For Hardness Tester	1	V-056	For Hardness Tester	1
POWER CORD	M-051	For Hardness Tester	1	V-052	For Hardness Tester	1
SYSTEM CONNECTING CABLE			1			1
AUXILIARY TOOLS		Screw Drive, Wrench, etc	1		Screw Drive, Wrench, etc	1
ACCESSORY BOX	M-056	For Hardness Tester	1	V-057	For Hardness Tester	1
INSTRUCTION MANUAL			1			1
LOAD WEIGHTS SET		(Built-in)	1		(Built-in)	1

FUTURE-TECH CORP.
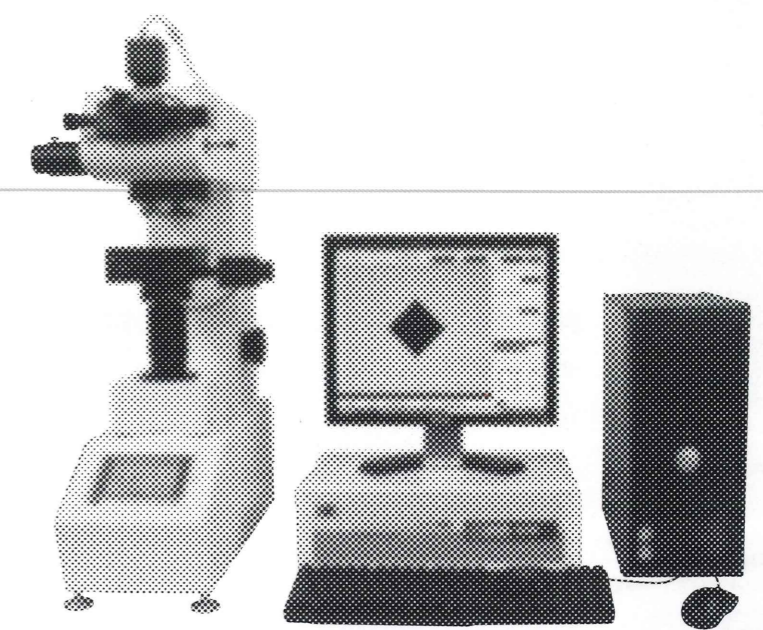
More Innovated Micro/ Macro Vickers Hardness Testing System

Most Advanced System with High-speed Sample Profile Memory Function.
High-speed, High-accuracy, High-repeatability, Easy-operation, Improved Read Power.
More Reliable for Large quantities of testing without human error.

◆ A series of measurement operations : Continuous Indentation∼Focusing∼Reading∼Data Record :Just by selecting a measurement pattern, all testing will be fully-automatic with high speed.

◆ Various Measurement Patterns···

   *Intelligent Sample Profile Memory Function allows complicated Random measurements or Teaching Measurement along with the edge of specimen − Standard Function

   *Various Patterns can meet customers' requirements : Straight Line / Zigzag / Circle /Arc / Line Set / Random / Matrix / Teaching / etc.
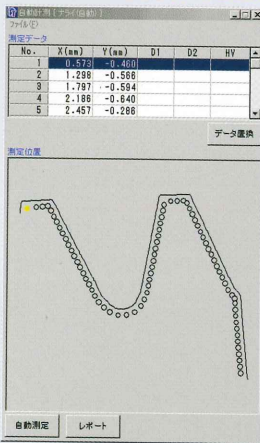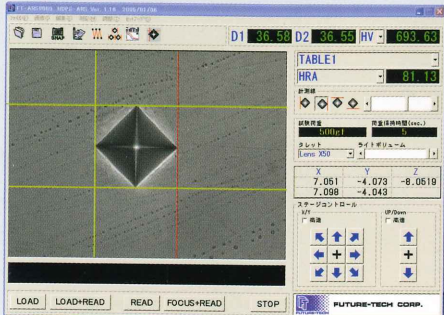

Teaching Pattern : 1 Line
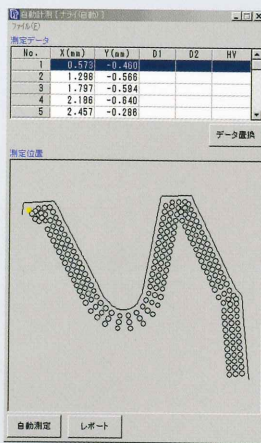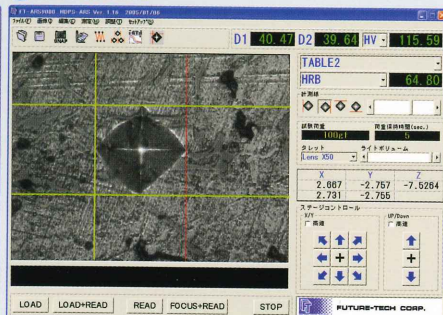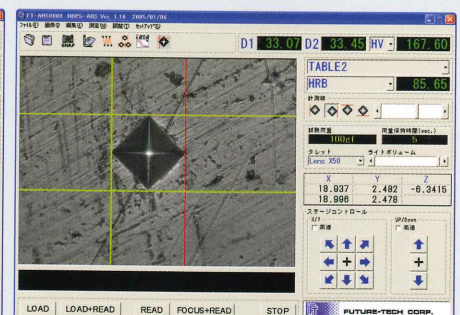

Teaching Pattern : 3 Lines
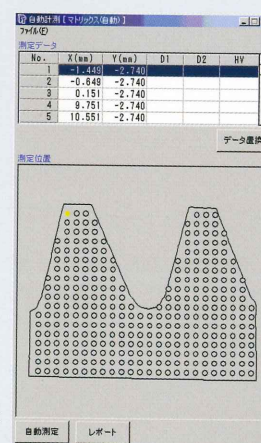
MatrixPattern

◆ Capability of Reading unclear Indents on un-mirror surface has been improved by more advanced Data Processing Software
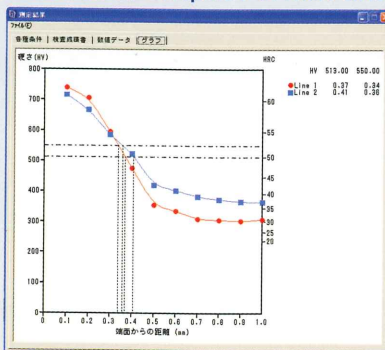

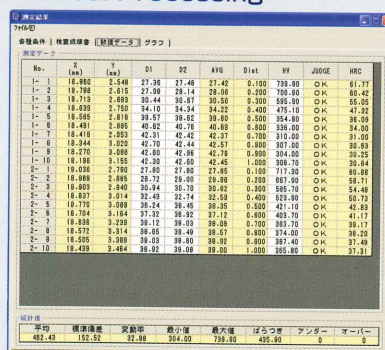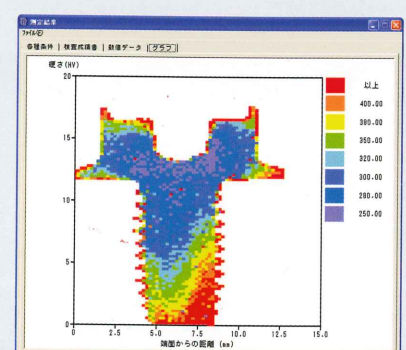Mirror Surface

Etched Surface

Scratched Surface

◆ Various Data Output Format and Statistical Processing···

Display for Case Depth

Display for Measurement Data

Display for Color Profile Picture linked with Hardness Values on Matrix Test Pattern

  * Case Depth of indicated HV Hardness can be displayed instantaneously on the Chart after continuous Measurements on Carbonized Layer.

  * Various Data Output available − Measurement Data, Hardness Distribution Chart, Case Depth, Max. Value, Min. Value, Mean Value, Dispersion, Standard Deviation, Coefficient of Variation, OK-NG Criteria, Conversion Data, etc.

  * Display and Output Color Profile Picture linked with Hardness Values − Standard Function