

AMT/AVT

AUTO HARDNESS TEST SYSTEM

PMT/PVT

AUTO-READING DEVICE SYSTEM



- The system is improved to various stages according to needs.
- The hardness tester effective is used.



MATSUZAWA
<http://www.matsuzawa-ht.com>

AMT/AVT PMT/PVT

自動硬さ試験システム

AUTO HARDNESS TEST SYSTEM

自動計測(読取)装置PCタイプ

AUTO-READING DEVICE SYSTEM

Function

An automatic focus and reading beforehand.

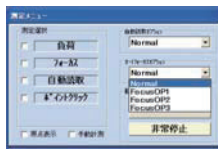
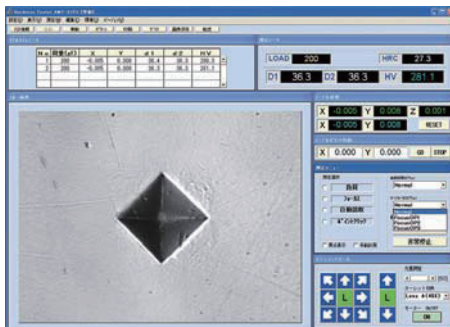
This function sets four kinds of detailed set values of an automatic focus and reading beforehand; those calls those set values easily on software.

(For AMT/AVT and PMT/PVT)

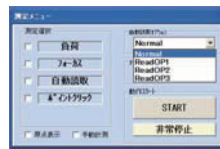
An automatic focus and reading can be done more smoothly and accurately. In the measurement of the sample with rough surfaces like etching, a very high effect is demonstrated.

Even if some of the samples with a rough surface are mixed, they can be measured smoothly and accurately by only selecting set values.

Please prepare several kinds of samples with a significantly different state on the surface.



Auto-focus



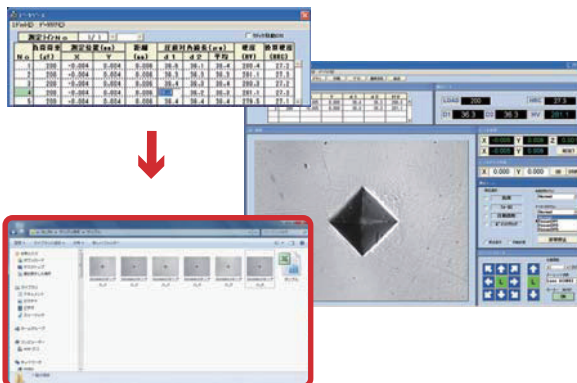
Auto-reading option

Function

Data synchronization measurement screen preservation function.

In addition to the measuring data, the Vickers hollow image can be read automatically and be synchronized with the measuring data and be preserved.

(For AMT/AVT)



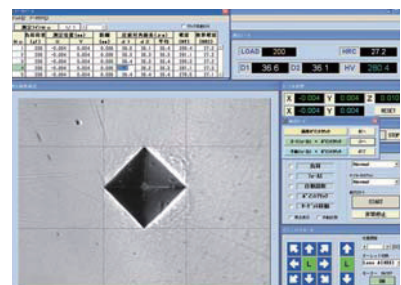
Function

Flexible measurement function.

After completing the measurements, this function can promptly follow up the work and once again measure images (if needed) on the data edit screen.

(For AMT/AVT and PMT/PVT)

Since all the hollow measurement images have been temporarily preserved by the internal PC, it can be reconfirmed promptly only if it is completed. The positive proof of hardness can therefore be more effective.

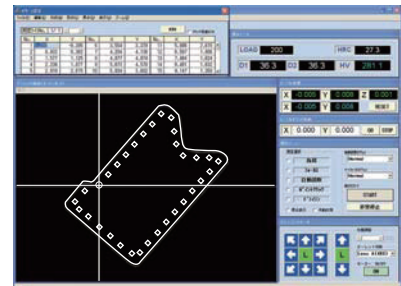


Function

Shape recognition function.

The shape of the specimen is traced by the automatic operation.

(For AMT/AVT)



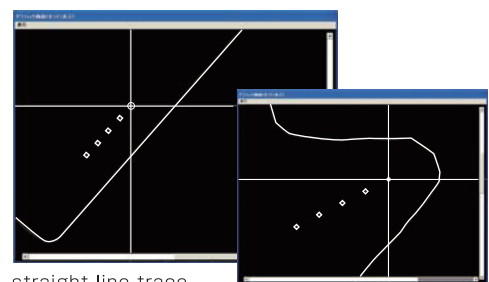
Function

The line origin function.

The starting point of the measurement line can be set by the shape trace based on the image.

(straight line division/arc division/straight line trace)

(For AMT/AVT)



straight line trace

arc division

AMT/AVT PMT/PVT SERIES LINE UP



PMT/PVT PMT/PVT SERIES

Automatic reading system

In addition to automatic reading, data processing and operation of hardness testers* can be operated in the PC side.

*Hardness tester models that can control is the only digital models.

S S SERIES

Automatic stage system

Excellent measurement by the JOG controller in the operation can be done.

System configuration

Type	Name	Data handing	Automatic stage	Automatic reading	Automatic focus
PMT/PVT SERIES	Automatic reading system	○	—	○	—
AMT/AVT - S SERIES	Automatic stage system	○	○	—	—
AMT/AVT - PS SERIES	Automatic stage-reading system	○	○	○	—
AMT/AVT - FS SERIES	Automatic stage-reading-focus system	○	○	○	○

List for each function

HARDNESS TESTERS

- MMT-X Series
- VMT-X Series
- Old type vickers (Micro vickers)
- Other company hardness tester ※Please consult.



Automatic reading system

PMT/PVT System up

- CCD camera
- Software
- PC(With 19 inch display / Without printer)

PMT/
PVT
Series



Sseries

Automatic X-Y stage system

- Auto X-Y stage
- Software
- PC(With 19 inch display and printer)

AMT/AVT
PS
Series



Auto focus

AMT/AVT
FS
Series



PS PS SERIES

Automatic stage-reading system

Various measuring patterns can be set.



With auto focus function

FS FS SERIES

Automatic stage-reading-focus system

Serial operation of position move - Loading - auto focus -auto reading are done in all automatic.

EX-TYPE



Wafer measurement system



Automatic vickers large stage system

In response to a demand of a customer,we meet needs for the specimen shape recognizer,the device of polishing specimen,the specimen supply device and completely full automatic system. Please inquire to our company any time.



Full automatic vickers hardness test system

This system perform specimen import,polishing,a hardness testing,specimen ejection on full automatic.And also it perform results judgement,and you can choose a point to eject specimen.

Go into detail in Web site.

http://www.matsuzawa-ht.com/item/h_system.htm



AMT/AVT SPECIFICATION

ITEM	CONTENTS
Auto X-Y stage	Max.movement:X and Y axis 50mm(standard) Loading area:110×110mm Min.movement:1 μm(50mm precision vice attached)
Stage operation	Operation with JOG controller.
Measuring view	about70 μm(×40) about140 μm(×20) about280 μm(×10)about560 μm(×5)
Reading speed	Shortest 0.5 sec/1 indentation(different by specimen surface condition)
Auto focus speed	Shortest 3 sec/1 indentation(different by specimen surface condition)
Reading reappearance	±0.5%(In case of test load:9807mN,700HV,×40),Min measurement:0.1 μm
Reading method	Select automatic or manual(Operation with a mouse)
Reading with eyes	Digital measurement microscope(Optional)
Personal computer	PC/AC interchangeable,Windows XP Pro. correspondence
Printer	Black and white laser printer or ink-jet printer ※PVT/PVT series is option
Control soft	Testing mode:Automatic,Single, Set-up pattern:Straight line,Circular arc,Circle,Teaching,Trace,Coordinate,Rotation Testing data display:Test load,Diagonal length,Operation hardness value,Conversion hardness value Graph display:Set-up parameter,hardening layer depth,The maximum,The minimum, X or Y axis independent distance Print out format:3 formats(Graph only mode,Data only mode,Graph and data mode),Exclusive format support(option) Other features:Real-time graphic display of measurement position,judgment function of the diagonal length. Safety device:Clash prevention function by a stage evasion function.
Power supply	Single phase AC110~240V 50/60Hz available for Export models.

PMT/PVT SPECIFICATION

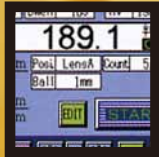
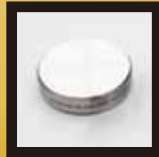
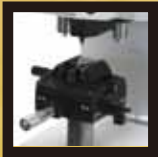
ITEM	CONTENTS	ITEM	CONTENTS
Construction		Power Supply	Single phase AC110~240V 50/60Hz available for export models.
Personal computer	Windows XP	Testing data display	Indentation diagonal length, hardness value, hardness conversion value,nominal testing power (by manual selection).
Operating system	PC/AT Interchangeable		Max.value,Min.value, dispersion(R),mean value, dispersion,standard deviation, processing capacity index.
Display	19" TFT		OK/NG criteria
Indentation picture input board	Indentation picture took by CCD camera is indicated on display.	Tsetting data preserved	Testing data can be preserved by Excel(XLS mode).
CCD camera	Interline method 1/3" CCD camera	Graph display	Indicate the testing result and vulcanizing stratum by graph on display.
CCD camera attachment	Connect to CCD camera and Tester.		
Power sources for CCD camera	Supply power source for CCD camera.	Printout	Printing out in 3-format (Graph only,Data only,Graph and Data)
Image processing device			
Magnification	×200~1700 ([Object lens]×5~40)		
Measuring view	70~600 μm ([Object lens]×5~40)		
Measuring limit	8~560 μm ([Object lens] ×5~40)		
Reading speed	≒0.5s(Standard block)		
Reading repeatability	±0.5% (9807mN,700HV,40X)		
Minimum measuring unit	0.1 μm		
Printer(Optional)	Centronics,Windows correspondence		

※Microsoft and Windows are registered trademark by Microsoft USA in USA and other details.

※Contents of this brochure is July 2010.Specifications and appearance may change without notice.

mmT-X

DIGITAL MICRO HARDNESS TESTERS



▶ MMT-X Feature

- The new function deploy, color LCD touch panel.
- The turret which mounted two indenter, four objective lenses.
- Testing area of industry maximum class.
- Wide test force range.
- Line up in LCD model.
- 0.01 μm measuring. (Magnification X200~X1000)
- LED light source.



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mmT-X

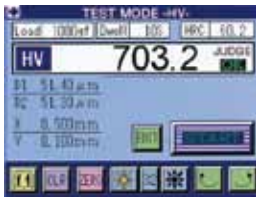
DIGITAL MICRO HARDNESS TESTERS

Operation Color LCD touch panel

Visibility and operativity improve by color LCD touch panel. Equipped with the assist function that can identify the most suitable measurement condition.

(Correspondence model: X3, X7)

HV testing mode (Vickers Hardness)



HK testing mode (Knoop Hardness)



※Knoop indenter(option) is required.

Light-load brinell mode



Ball indenter(option) is required.

Xbar mode

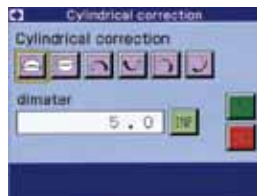


This mode can display the mean and difference immediately.

Fracture toughness KC testing mode.



Cylindrical correction mode :



This mode can set spherical surface and cylindrical correction.

Assist function



This mode can identify the testing condition which is optimum is carried. The testing condition which is optimum can be confirmed by satisfying 2 from 3 condition of thickness, hardness, test load.

Function

The turret which mounted two indenter, four objective lenses.



Two indenter and four objective lenses are realized following conventional stable loading mechanism. The measuring that reliability is high can be done in various test condition.

(All mode correspondence)

Measuring unit 0.01 μm was realized by corresponding to high magnification of measuring, total magnification 200 \times -1000 \times .

(Correspondence model: X3, X7)

Operation Line up in LCD model.

Clear specimen surface image magnified on TFT LCD monitor is displayed. Fatigue by the long operation is decreased. The integrated structure, there is no eye movement.

Because the Measurement knob is placed in the measurement panel, you can significantly reduce the fatigue of working long hours.

(Correspondence model: X3, X7)



Function

Testing area of industry maximum class.

By a new design, testing range of specimen height 120mm and specimen depth 160mm was secured.

(All mode correspondence)





MMT-X7

Digital model with auto turret.

Digital type

Min.scale : 0.01 μ m(200 \times ~1000 \times)

Min measuring unit : 0.01 μ m(200X~1000X)

Touch panel type / Turret : Auto

Data output type / Dwell time : 5~99sec

MMT-X3

Digital model with touch panel.

Digital type

Min.scale : 0.01 μ m(200 \times ~1000 \times)

Min measuring unit : 0.01 μ m (200X~1000X)

Touch panel type / Turret : Manual

Data output type / Dwell time : 5~99sec

MMT-X1

order made

Economy model of manual operation. Analog type

Specifications

Hardness Tester Model

Item / Model			MMT-X7			MMT-X3				MMT-X1					
Test force	Standard	Type A	49.03	98.07	245.2	490.3	980.7	1961	2942	4903	9807mN				
			5	10	25	50	100	200	300	500	1000gf				
	Option	Type B	9.807	29.42	49.03	98.07	245.2	490.3	980.7	1961	2942	4903	9807	19614	mN
			1	3	5	10	25	50	100	200	300	500	1000	2000	gf
Loading mechanism			Automatic loading and releasing method												
indenter approach speed			50 μ m/sec												
Dwell time			5~99sec						5~30sec						
Indenter			Standard:1(HV),Option:2(HV,HK)												
Objective lens			Standard:2(40X, 10X *in case of AMT-PS/FS series : 40X, 5X), Option: Max.4(5X~100X)												
Eyepiece lens			Standard10 \times option15 \times												
Total magnification			Standard(400X,100X) Corresponding50 \times ~1000 \times												
Measuring microscope (total 400 \times)	Max.measuring length		250 μ m												
	Min.scale		0.01 μ m(200 \times ~1000 \times)						0.5 μ m						
	Min.measuring unit		0.01 μ m(200 \times ~1000 \times)						0.1 μ m						
	Type		Electronic type						Mechanical type						
Light source			LED light source												
Turret			Auto			Manual									
LCD touch panel			Color LCD touch panel						-						
Testing mode			6 kinds of HV,HK,HBS,KC,Xbar,Cylindrical correction												
Data memory			999 data memory												
Hardness conversion			Possible in compliance with SAE(J-417B),ASTM(E-140)												
OK/NG criteria			Judging to the results by setting Max. and Min.												
Statistical caluation			Max.value,Min.value,dispersion(R),mean value,converted value.												
Max. height of specimen			120mm												
Max. depth of specimen			160mm												
Data output			①Centronics(Dot printer output)										-		
			②RS232C(Output for PC),Possible to change to printer output												
Accuracy			According to JIS B7725 and ASTM E-384												
Photo booth			The photo booth can be installed in the body tube in the upper part of the main body at any time.												
Dimensions and weight			Main body only W250 \times D520 \times H530mm 35kg												
Power supply			Single phase AC100V~240 50/60Hz available for Export models												

TV measuring device



TVL

The 10.4inch TFT LCD monitor is attached.
(All mode correspondence)

LCD model



LCD

The 10.4inch TFT LCD monitor is integrated.
(Correspondence model:X3,X7)

TV measuring device Set Model

Item / Model	MMT-X□-TVL
CCD camera	1/2"CCD camera
Monitor	10.4" TFT LCD
Monitor magnification	≒ 1200×
Min.scale	0.01μm
Data display	Display on touch panel ※1
Output	Monitor output(NTSC)

LCD integrated model

Item / Model	MMT-X□-LCD
CCD camera	1/3"CCD camera
Monitor	10.4" TFT LCD
Monitor magnification	≒ 1600×
Min.scale	0.1μm
Data display	Display on monitor/Display on touch panel
Output	Monitor output(RGB)

※Number of hardness tester is in a part of □ of a model name. LCD integrated model is only digital model.(X3,X7)

※1 X1 do not have a data display function.

Automatic System



**Automatic reading system
PMT series**

PC system of the automatic reading function deployment. In addition to automatic reading, data processing and operation of hardness testers* can be operated in the PC side.



**Automatic stage system
AMT-S series**

PC system of the automatic stage deployment. Excellent measurement by the stage control box in the operation can be done.



**Automatic stage-reading system
AMT-PS series**

PC system of the automatic reading and stage function deployment. Various measuring patterns can be set.



**Automatic stage-reading-focus system
AMT-FS series**

PC system of the reading, automatic stage, auto focus. Serial operation of position move - Loading - auto focus - auto reading are done in all automatic.

Automatic focus

※Hardness tester models that can control is the only digital models.

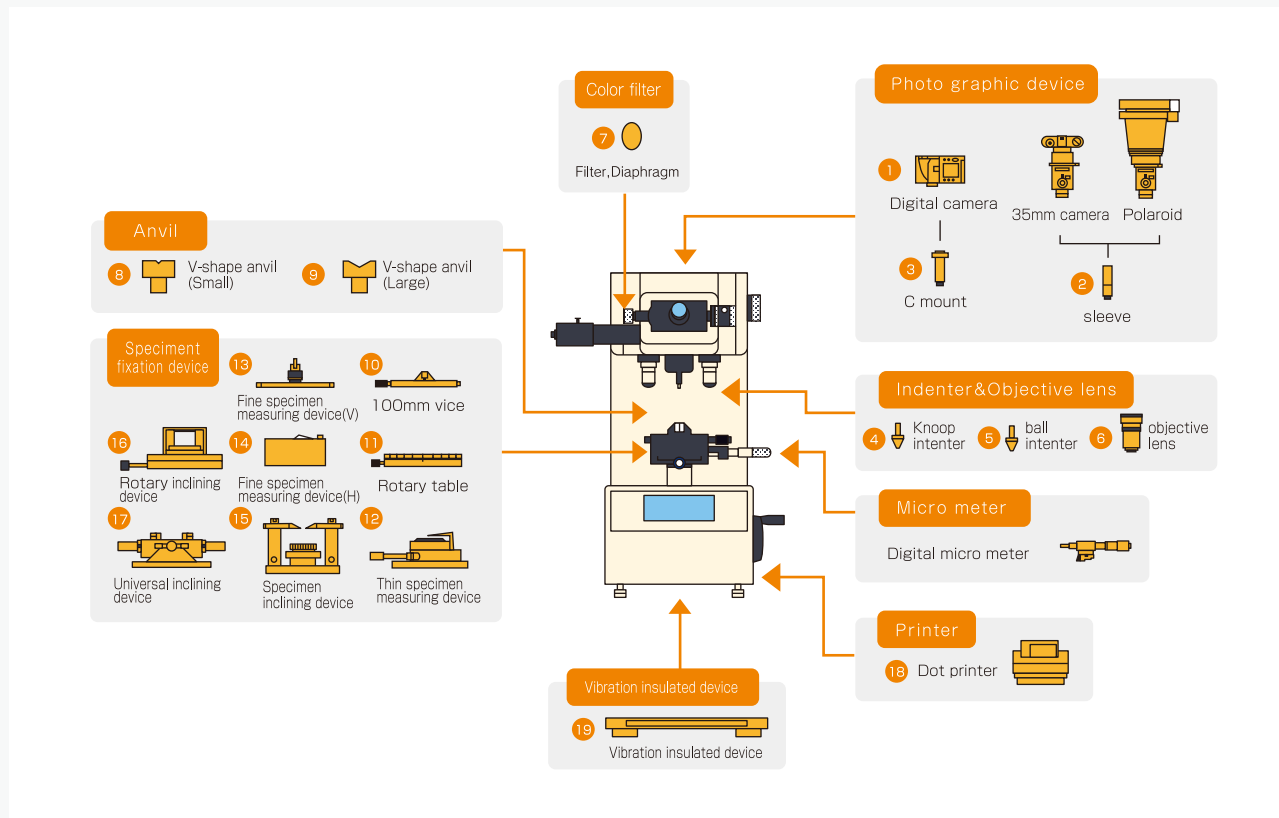
Automatic System

Item / Model	PMT-X□	AMT-X□S	AMT-X□PS	AMT-X□FS
Correspondence model	X1, X3, X7	X3, X7	X3, X7	X7
Auto reading	○	—	○	○
Data processing	○	○	○	○
Auto stage	—	○	○	○
Auto focus	—	—	—	○
Stage control box	—	○	○	○
PC	PC/AT convertible			
Monitor	19" TFT monitor			
OS	Windows XP professional SP3(Corresponding windows7 in the future.)			
Other	X-Y data input option	Corresponding exclusive fully automatic system ※please consult		

※Number of hardness tester is in a part of □ of a model name. Please use an exclusive catalog on the details.

※Windows is a registered trademark by Microsoft USA in USA and other countries.

Option



Factory Setting Option

ID Code	Item	Specification	Model	Note
LB	Test Force type	Type B(1~2000gf 12step)	All	Standard:Type A
AP	Test Force change device	Automatic change(Panel operation)	X3,X7	
ID	Indenter	Two simultaneous installation(HV, HK)	All	
T3,T4	Objective lens	T3:3 objective lens / T4:4 objective lens	All	Standard:2 lens
DM	Micrometer	Digital micrometer	X3,X7	Displaying a coordinate value on touch panel & cable accessory

※Specify the above option at the time of the order. An exchange becomes possible only in our company factory later.

Optional Accessories

Code No.	Item	Contents
M203	Photographic device:Digital camera ①	Nikon Microsystem(Digital camera,relay lens,accessory)
M211	Camera sleeve ②	For polaroid camera or 35mm camera.
M212	C mount ③	For digital camera or automatic system.
M002	Knoop indenter(HK) ④	Effectively measures thin material.
M003	Ball indenter(HB) ⑤	For light-load brinell test.(ϕ 1mm cemented carbide steel ball)
M071~075	Objective lens ⑥	100X(M071), 40X(M072), 50X(M080), 20X(M073), 10X(M074), 5X(M075)
M076	Eyepiece	15X
M081	Color filter ⑦	ϕ 20mm yellow,blue,red(standard:green)
M082	Aperture diaphragm ⑦	1mm~6mm(1mm pitch,6 size)
M020	V-shape anvil(Small) ⑧	For measuring the cylindrical surface together with vice. ϕ 2mm~ ϕ 6mm
M021	V-shape anvil(Large) ⑨	For measuring the cylindrical surface together with vice. ϕ 8mm~ ϕ 50mm
M012	Precision vice ⑩	Max. opening:100mm
M013	Rotary table ⑪	360° rotation.This table is usually on the micro test table with precision vice.
M014	Thin specimen measuring device ⑫	Specimen thickness:0.05~5mm
M015	Fine specimen measuring device(V) ⑬	Vertical type.Specimen diameter:0.1~4mm
M016	Fine specimen measuring device(H) ⑭	Horizontal type.Specimen diameter:0.5~4mm
M017	Specimen inclining device ⑮	The measuring surface always shows a horizontal level.Specimen height:5~21mm
M018	Rotary inclining device ⑯	Specimen diameter :1inch, 1 1/4inch, 1 1/2inch select one size as you want
M019	Universal inclining device ⑰	When the specimen is inclined or curved,this device is effective to get the correct level.
CO01	Dot printer ⑱	From CBM-910II hardness tester adding up results to data output.
M171~M175	Vibration insulated device ⑲	On the desk type(Rubber cushion type:M171,Manual air type:M172, Auto air type:M173,Compound mount type:M175),Desk type(M174)
M102	Table for Knoop hardness number	For HK 5gf~50kgf

Standard Accessories

Code No.	Item / Model	MMT-X7	MMT-X3	MMT-X1
MO31	Manual X-Y stage(Built in/Max.movement:25mm/Min scale:0.01mm)		1	
MO11	Precision vice(Max.opening:50mm)		1	
MO61	Standard test block(700HMV0.2)		1	
MO01	Diamond indenter		1	
MO41	Measuring microscope:Electronic type	1		—
MO42	Measuring microscope:Mechanical type	—		1
MO72	Object lens 40×(Built in)		1	
MO74	Object lens 10×(Built in)		1	
M111	Level adjusting leg		4	
M112	Level		1	
MO94	Spare fuse(100~220V5A)		2	
CO31	Power cord(3P 2.5m)		1	
M161	Machine cover		1	
—	Auxiliary tool kit		1	
—	Instruction manual(Basic&Application)		1	
—	Inspection sheet		1	
M101	Table for Vickers hardness number(5gf~50kgf)	—		1

Data processing software

Hardness Data Communication Software(Optional)

HARDCOM SERIES

Testing data are transmitted to Microsoft Excel directly.

Testing data can be managed if software is installed in the personal computer.

(Microsoft Excel is separately necessary.)



Connection method

Hardness meter output(RS232C)-PC input(RS232C or USB)
 *USB serial converters standard attachment·Corresponds to USB2.0

Data processing function

Testing data, test condition, statistics data and graph drawing are equipped.

Measurement position data can be input.

Testing position data are indicated by connecting a digital micro-meter.

(Digital micro-meter is separately necessary.)

Support an exclusive format.

The input part of the testing condition is freely revokable.

Our company will produce it if there is hope by a special form.

Code No. S001 Standard Software

Code No. S002 Software with the position data input function.

Corresponding model:MMT-X3,X7 · VMT-X3,X7 · RMT-1,3

*RMT series does not have the functionality of a data entry position.
 OS:Windows2000,XP,Vista,7 Excel Version:corresponds up to 2010

HARDNESS TEST DATA					
Condition	2005/7/7	Port No.	00-00-101	Material	S45C
Operator	UEES	Pro. No.	5405	Heat	
Item	Sample Test	Lot No.	46000	Other	
Note					



Point	Max.	Min.	R	Av.	Stdev	Upper L	Upper L	Cr	Chk
0	8000	5800	5400	4631	1967	9000	8000	080	040

Test Data	No	X	Y	Distance	Load (gf)	Original (μm)	OC	Hardness (HV)	Dist. Scale	Conv. Hardness	Judge
1	01	0	01	0007	15.1	19.2	800.0	HV	800.0	OK	
1	02	0	02	0007	15.2	19.3	806.7	HV	806.7	OK	
1	03	0	03	0007	15.6	19.7	747.8	HV	747.8	OK	
1	04	0	04	0007	17.2	19.7	623.5	HV	623.5	OK	
1	05	0	05	0007	18.8	18.8	552.3	HV	552.3	OK	
1	06	0	06	0007	20.1	20.2	492.2	HV	492.2	OK	
1	07	0	07	0007	21.6	21.7	395.7	HV	395.7	OK	
1	08	0	08	0007	22.1	22.0	381.4	HV	381.4	OK	
1	09	0	09	0007	23.5	23.8	334.4	HV	334.4	OK	
10	1	0	1	0007	24.0	24.1	305.1	HV	305.1	OK	
10	1.1	0	1.1	0007	24.3	24.6	297	HV	297	OK	
10	1.2	0	1.2	0007	25.1	25.3	260.0	HV	260.0	OK	
10	1.3	0	1.3	0007	26.8	26.8	198.8	HV	198.8	OK	
10	1.4	0	1.4	0007	28.5	28.4	185.1	HV	185.1	OK	
10	1.5	0	1.5	0007	28.9	28.7	158.2	HV	158.2	OK	

*Microsoft and Windows are registered trademark by Microsoft USA in USA and other details.

*Contents of this brochure is September 2012. Specifications and appearance may change without notice.



MATSUZAWA MATSUZAWA CO.,LTD

120-10, Aza-Nanamagaridai, Toshima, Kawabe,
 Akita-shi, Akita Pref, 019-2611, Japan

TEL.+81-18-882-4580 FAX.+81-18-882-4584

E-MAIL:support@matsuzawa-ht.com URL:http://www.matsuzawa-ht.com

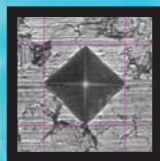
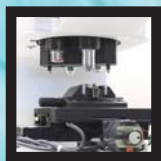
●Tokyo Office 2-43-1-506, Tagara, Nerima-ku, Tokyo, 179-0073, Japan TEL/FAX.+81-3-3975-9216

●West JAPAN Office 2-9-17, Koinokubo, Nara-shi, Nara Pref, 630-8136, Japan TEL.+81-742-32-5641 FAX.+81-742-34-7772

●Sakae Office

VMT-X

デジタルビッカース硬さ試験機 DIGITAL VICKERS HARDNESS TESTERS



▶ VMT-Xの特長 Features of VMT-X

- ・最大4本レンズ対応
The turret which mounted four objective lenses.
- ・カラー液晶タッチパネル搭載
Color LCD touch panel.
- ・各種モード・機能充実
The new function deploy.
- ・0.01 μm 計測(20倍レンズ以上)
High-resolution evaluation measurement.
- ・LED光源(オプション)
LED light source.



MATSUZAWA

<http://www.matsuzawa-ht.com>

VMT-X

デジタルビッカース硬さ試験機

DIGITAL VICKERS HARDNESS TESTERS

操作 高分解能計測 [0.01 μ m]

High-resolution evaluation measurement.
[0.01 μ m]

最小分解能を0.01 μ m化、より正確な硬さを算出することができます。対応倍率範囲：X200~X1000。

(対応機種：VMT-X3、X3S・VMT-X7、X7S)

Measuring unit 0.01 μ m was realized by corresponding to high magnification of measuring. Total magnification X200 - X1000.
(Correspondence model: VMT-X3, X3S・VMT-X7, X7S)

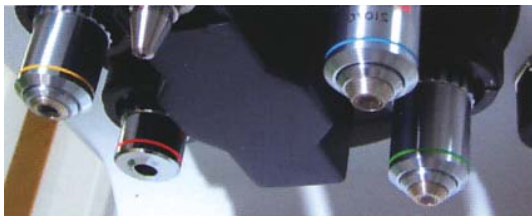
D1 = 51.5
D2 = 51.2 } 717.2HV

D1 = 51.59
D2 = 51.21 } 715.7HV

機能 対物レンズ最大4本装着(オプション)

The turret which mounted four objective lenses. (option)

対物レンズを最大4本まで搭載可能。(全機種対応)※1



Four objective lenses are realized following conventional stable loading mechanism. The measuring that reliability is high can be done in various test condition. (All model correspondence.)

※1: VMT-X1・VMT-XIS(アナログモデル)は、各倍率ごとに計測顕微鏡(アナログ用)が必要となりますので、ご注意ください。

機能 LED光源 (オプション)

LED light source. (option)

オプションにLED光源を用意。高倍率での試料の表面観察や低コントラストの試料の表面観察に威力を発揮します。

(全機種対応)

LED light source is prepared in the option. This is useful for observing the sample surface at high magnification, is also useful to observe the surface of a sample of low contrast. (All model correspondence.)



操作 カラー液晶タッチパネル・各種モード

The new function deploy. Color LCD touch panel.

カラー液晶の搭載により視認性・操作性が向上。

(対応機種：VMT-X3、X3S・VMT-X7、X7S)

Visibility and operativity improve by color LCD touch panel. (Correspondence model: VMT-X3, X3S・VMT-X7, X7S)



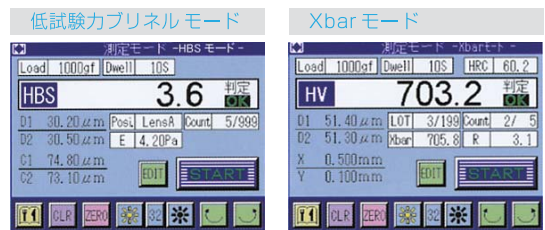
ビッカース硬さを試験します。

HV testing mode
(Vickers Hardness)

ヌーブ硬さを試験します。

HK testing mode
(Knoop Hardness)

*ヌーブ圧子はオプションです。
*Knoop indenter(option) is required.



鋼球圧子(オプション)を取り付け、試験力の合うブリネル硬さを試験可能です。

Light-load brinell mode
ball indenter(option) is required.

ビッカース硬さや値の平均値や、ばらつき(最大値-最小値)を即時に表示します。

Xbar mode :
This mode can display the mean and difference immediately.

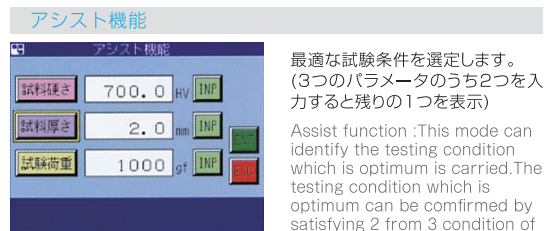


破壊靱性を試験します。

Fracture toughness
KC testing mode.

球面・円筒の試験時の補正を設定できます。

Cylindrical correction mode :
This mode can set spherical surface and cylindrical correction.



最適な試験条件を選定します。
(3つのパラメータのうち2つを入力すると残りの1つを表示)

Assist function : This mode can identify the testing condition which is optimum is carried. The testing condition which is optimum can be confirmed by satisfying 2 from 3 condition of thickness, hardness, test load.



VMT-X7(S)

オートターレットを装備したデジタルモデル

デジタルタイプ Digital model with autoturrets.

最小計測単位：0.01 μ m(200 \times ～1000 \times)
Min measuring unit : 0.01 μ m (200X~1000X)

タッチパネル：あり / ターレット回転：自動
Touch panel type / Turret : Automatic

データ出力：あり / 試験力保持時間：5～99sec
Data output type / Dwell time : 5~99sec

VMT-X3(S)

液晶タッチパネル搭載のデジタルモデル

デジタルタイプ Digital model with touch panel.

最小計測単位：0.01 μ m(200 \times ～1000 \times)
Min measuring unit : 0.01 μ m (200X~1000X)

タッチパネル：あり / ターレット回転：手動
Touch panel type / Turret : Manual

データ出力：あり / 試験力保持時間：5～99sec
Data output type / Dwell time : 5~99sec

VMT-X1(S) 受注生産品

マニュアル操作のエコノミーモデル アナログタイプ
Economy model of manual operation.

TV 計測装置 TV measuring device set model

圧痕画像を TV に表示させくぼみ計測を行うことができます。眼精疲労を抑え、くぼみ計測の誤差を軽減させます。くぼみ計測スピードも向上させることができます。また、画面を見ながらトレーニングすることで、個人誤差も軽減させることができます。

Clear specimen surface image magnified on TV monitor is displayed. This model suppress fatigue of the eyes and can let a measurement error reduce. You can train a measurement way while watching a monitor, so you can let a personal error reduce.



TVL

10.4インチ
液晶モニター付属
10.4 inch "LCD Monitor

自動読取装置 Automatic system

画像処理ソフトウェアを使ってくぼみの読取を自動で行うことで個人誤差を大幅に低減します。全自動でくぼみ作成から測定までを行うことにより測定コストの削減が可能です。

専用の特殊治具(オプション)を作製すると、更に試験時間を短縮できます。

This automatic-system can dissolve a personal error in reading of indentation by the latest image processing software and reduce hardness measurement cost time. We can provide making exclusive immobilize for a specimen of a customer. So you can reduce hardness measurement cost time still more. (Please ask us for more information.)

*Please see more details by each catalogue.



AVT-Xシリーズ PVTシリーズ

AVT-X Series
Auto hardness test system.
PVT Series
Auto-reading device system.

全自動硬さ試験装置 Exclusive full-auto test system

前身である松沢精機の時代から硬さ試験自動化で業界をリードしてきたマツザワだからこそ、様々なユーザーニーズに合わせた専用のフルオートシステムをご提供できます。硬さ試験等の測定コストタイムでお悩みの方はお気軽に弊社までお問い合わせください。

We will provide the exclusive fully automatic system which we was able to meeting the various user needs that it is possible for to be Matsuzawa who led the industry by automation of a hardness test from Matsuzawa's antecedent cost time of a hardness test willingly to our company.



試験片の供給、排出、研磨も含めたフルオートシステム

The fully automatic system which included supply of specimen, ejection, polishing.



一連の動作をHP上で動画で確認できます。

http://www.matsuzawa-ht.com/item/h_system.htm

仕様 SPECIFICATION

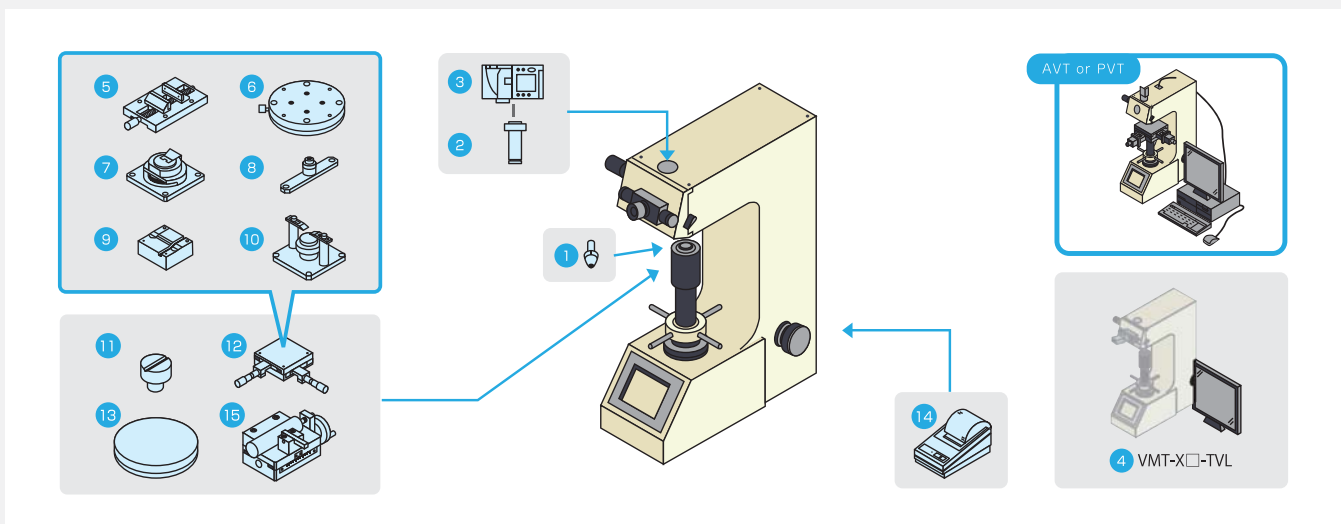
項目 ITEM		VMT-X7			VMT-X3			VMT-X1		
試験力 Test force	-	9.807 1	19.61 2	29.42 3	49.03 5	98.07 10	196.1 20	294.2 30	490.3 50	N kgf
	S	2.942 0.3	4.903 0.5	9.807 1	29.42 3	49.03 5	98.07 10	196.1 20	294.2 30	N kgf
試験力機構 Loading mechanism		自動負荷・保持・解除方式 Automatic loading and releasing method.								
ターレット Turret		自動 Automatic			手動 Manual					
試験力負荷速度 Load applying speed		85 $\mu\text{m}/\text{sec}$								
試験力保持時間 Dwell time		5~99sec						5~40sec		
最小計測単位 Min.measuring unit		0.01 μm (200 \times ~1000 \times), 0.02 μm (100 \times)						0.1 μm (目測)		
対物レンズ objective lens	-	10 \times								
	S	10 \times , 20 \times						20 \times		
接眼レンズ Eyepiece lens		10 \times								
計測顕微鏡 Measuring microscope	最大計測長 Max.measuring length	100 \times :999.9 μm (200 \times :600.0 μm)								
	表示倍率 Magnification	100 \times (200 \times)								
	タイプ Measuring type	電子式 Electronic						機械式 Machine		
データ出力 Data output		① セントロニクス (標準装備) Centronics(standard) ② RS232C 又はシリアル 指示なき場合は RS232C Output selectable RS232C or Serial.						-		
データメモリ機能 Data memory		最大 999 Max.999 test data						-		
硬度換算機能 Hardness conversion		ASTM(E-140),JIS により表示及び集計演算出力 Possible in compliance with ASTM(E-140),JIS.						-		
合否判定機能 OK/NG criteria		OK/NG で表示 (最大値・最小値設定) Upper and lower limits setting,and HI/OK/LOW display.						-		
統計演算 Statistical calculation		最大値、最小値、ばらつき、平均、標準偏差、工程能力指数の表示・出力 Data output and display:Max.value,min.value, dispersion(R),mean value,standard deviation.						-		
通信フォーマット設定 RS232C communication line		伝送速度: 1200/2400/4800/9600 bps の選択 Baud rate select:1200/2400/4800/9600 bps 誤り検出、偶数パリティ / パリティ無し選択 Error detection,Parity select:even/none						-		
精度 Accuracy		ISO 6507-2,JIS B7725,ASTM(E-92) 準拠 Conform to ISO 6507-2,JIS B7725,ASTM(E-92)								
試料最大高 Max.specimen height		250mm								
試料最大奥行 Max.specimen depth		150mm								
機体寸法 Dimensions		W230 \times D580 \times H770mm								
機体重量 Weight		試験力標準タイプ: 約 55kg ・ 試験力 S タイプ: 約 52kg Test force standard Type:about 55kg ・ S Type:about 52kg								
使用電源 Power supply		国内: AC100V 50/60Hz, 海外: 100~240V 50/60Hz 単相 Single phase AC100~240V 50/60Hz available for export models.								

標準付属品 STANDARD ACCESSORIES

コード No Code No.	項 目 ITEM		VMT-X7S	VMT-X7	VMT-X3S	VMT-X3	VMT-X1S	VMT-X1
V061	硬さ基準片 (800HV30) Hardness standard block					1		
V001	ダイヤモンド圧子 (本体装備) Diamond indenter(Built in)					1		
M041	電子式計測顕微鏡 Measuring microscope : Electronic type			1				-
V043	機械式計測顕微鏡 Measuring microscope : Mechanical type							1
M074	対物レンズ 10 (本体装備) Objective lens 10X (Built in)				1			- 1
M073	対物レンズ 20 (本体装備) Objective lens 20X (Built in)		1		- 1		- 1	-
R101	アンビル Anvil	φ60mm平 φ60mm flat				1		
R105		V型 (大) V-shape(Large)				1		
M300	小型水準器 Small level					1		
M091	光源ランプ 12V18W Light source bulb(12V18W)					2		
M094	予備ヒューズ 5A Spare fuse (5A)					2		
C031	電源コード (3P-2.5m) Power code(3P-2.5m)					1		
M111	水平調整用脚 Level adjusting leg					4		
-	補助工具一式 Auxiliary tools					1		
-	転倒防止用金具 Attachment for preventv the machine fall					2		
V161	機体カバー Machine cover					1		
-	取扱説明書 (基本&応用)一式 Instruction manual(Basic&Application)					1		
-	検査成績書 Inspection sheet					1		
M101	硬度算出表 Table for Vickers hardness number							1

特別付属品 OPTIONAL ACCESSORIES

コードNo Code No.	項目 ITEM	内容 CONTENTS
V002	ヌーブ圧子 (HK) Knoop indenter	① ヌーブ硬さ試験用 For knoop hardness test.
M212	C マウント C Mount	② デジタルカメラ等の装着に使用。 Adapter for a camera.
M202	写真撮影装置 Photographic device	③ デジタルカメラ Digital camera
TVL	TV モニター計測装置 TV monitor measuring device	④ 計測顕微鏡部に CCD カメラを取り付け、モニター上に拡大された圧痕を計測。顕微鏡の計測線で計測。計測長さ・硬さ値は硬さ試験機本体の LCD に表示。 By mounting CCD camera on ocular, measuring the indentation enlarged on monitor display by measuring line of ocular. Display the diagonal lengths and hardness values on LCD screen of tester.
MO11	精密バイス (開口量 50mm) Precision vice (50mm)	開口量 : 50mm Max. Opening : 50mm
MO12	精密バイス (開口量 100mm) Precision vice (100mm)	開口量 : 100mm Max. Opening : 100mm
MO13	回転テーブル Rotary table	⑥ 試験試料 360° 回転可能。 This table is usually used on the manual 試料の固定には、精密バイスなどをお使い下さい。 x-y stage with the precision vice.
MO14	薄物測定台 Thin specimen measuring device	⑦ 試料厚さ 0~5mm Specimen thickness : 0~5mm
MO15	細物測定台 (タテ型) Fine specimen measuring device vertical type	⑧ 試料直径 0.1~4mm Specimen diameter : 0.1~4mm
MO16	細物測定台 (ヨコ型) Fine specimen measuring device horizontal type	⑨ 試料直径 0.5~4mm Specimen diameter : 0.5~4mm
MO17	試料傾斜台 II 型 Specimen inclining device type II	⑩ 試料の水平出しが容易に可能。 試料最大高 : 21mm The testing surface always shows a horizontal level and causes an extremely efficient measuring operation. 試料最小高 : 5mm Specimen height : 5~21mm
R104	V 型アンビル (小) V-shape anvil small	⑪ 丸物の試料試験時に固定して使用。 For testing the cylindrical surface together with the vice.
V032 V033	手動 X-Y ステージ Manual X-Y stage	⑫ 移動量 X,Y 各 25mm (耐荷重 20kg : V032), 及び各 50mm (: V033) Max. movement : X and Y axis 25mm (withstand load 20kg : V032) or 50mm (: V033)
R111	丸テーブル Round table	⑬ φ200 焼入れ無し φ200 not tempered
C001 C002	プリンタ CBM-910 II Printer CBM-910 II	⑭ 硬さ試験機本体での集計・演算結果を出力印字。 From hardness tester adding up results to data output. 100V 用 : C001 120/230V 用 : C002 for AC100V : C001 for AC120/230V : C002
R121	ジョミニー試験用手動ステージ Micro test table for jominy test	⑮ 規定寸法のジョミニー試験片をワンタッチで固定し、手動にてミリ又は インチ単位で微動送りするステージ。 Max. movement: Approx. 55mm Min. micro graduation : 1/10mm or 1/160"
S001	データ通信ソフトウェア (HARDCOM) Data Communication Software (HARDCOM)	硬さ試験機のデータを Microsoft excel へ出力 (対応バージョン: excel2010 まで、対応 OS: Windows2000, XP, Vista, 7) Data of Hardness tester are transmitted to Microsoft Excel directly. (Excel version: corresponds up to 2010/OS : Windows2000, XP, Vista, 7)



※カタログ記載の内容は 2011 年 1 月現在のものです。仕様・外観は予告無しに変更する場合があります。



〒019-2611 秋田県秋田市河辺戸島宇七曲台 120-10
 120-10, Aza-Nanamagaridai, Toshima, Kawabe, Akita-shi, Akita Pref, 019-2611, Japan
 TEL.018-882-4580 FAX.018-882-4584
 E-MAIL:support@matsuzawa-ht.com URL:http://www.matsuzawa-ht.com

- 東京連絡所 〒179-0073 東京都練馬区田柄 2-43-1-506 TEL/FAX.03-3975-9216
- 西日本営業所 〒630-8136 奈良県奈良市窓の窪 2-9-17 TEL.0742-32-5641 FAX.0742-34-7772
- 堺出張所 〒599-8261 堺市中区堀上町 288-111 TEL.072-276-1272 FAX.072-276-0505

RMT

デジタルロックウェル硬さ試験機 DIGITAL ROCKWELL HARDNESS TESTERS



▶ RMTの特長 Features of RMT

- ・カラー液晶ディスプレイ(タッチパネル)
・Color LCD touch panel
- ・オートスタート
・Auto start
- ・簡単なセッティング
・Easy setting
- ・プラスチック測定が標準装備
・Testing method for plastic
- ・豊富なデータ処理機能
・Various data processing functions
- ・信頼性の高いダイヤル切替方式
・Traditional dial change-over system
- ・CE対応と安全性
・Applicable to CE and safety



MATSUZAWA
<http://www.matsuzawa-ht.com>

RMT

デジタルロックウェル硬さ試験機 DIGITAL ROCKWELL HARDNESS TESTERS

操作 カラー液晶タッチパネル

Color lcd touch-panel

バックライト付LCDを搭載。見やすい画面で高度の視認性を確保しました。

Loaded with a LCD display with backlight. The hardness tester secures very clear and high visibility.



機能 オートスタート

Auto start

初試験力セット後は追加試験力が自動的に負荷されま
す。スタートキーを押す煩わしさがなくなりました。(マニ
ュアルスタートも可能)

After setting the preliminary test force the test load is
applied automatically. (Manual start is also possible)

機能 簡単なセッティング

Easy setting

初試験力セットは明るい画面のバーグラフ表示で簡単にセッ
トできます。安心のミス防止機能も搭載。

preliminary test force can be easily set with a bar graph
display on the bright screen and electronic sound. More
over, an error-preventing device is also mounted.

機能 プラスチック試験方法が標準装備

Testing method for plastic

JIS 規格「プラスチックのロックウェル硬さ試験方法」に
よる測定がワンタッチで切り替えが可能です。試験力除荷
後読み取りまでの時間は任意に設定できます。

Specific testing method for plastic in compliance with
ASTM and JIS is activated by one-touch easy
operation. Time for reading the value after unloading the
test load can be set freely.

機能 豊富なデータ処理機能

Various data processing function

合否判定、他のスケールへの換算、データメモリ(999)、最
大値、最小値、ばらつき、平均値、標準偏差、工程能力指数の
統計演算表示及び出力をします。

It makes acceptance and rejection judgement, conversion
to other tabulation and computing for data memory(256
data), maximum value,
minimum value, variation, average, standard deviation etc.

機能 CE対応と安全性

Applicable to ce and safety

EUの低電圧指令、EMC指令、機械指令に対応の安全設計で
す。剛性の高いボディと地震などの振動による転倒を防ぐ
転倒防止金具が標準付属で、安全に設置できます。

Safety design applicable to EU low voltage command, EMC
command and machine command. In addition to
high-rigidity body, overturn-preventive metal fittings are
attached as standard to prevent overturning by
earthquakes etc.

機能 信頼性の高いダイヤル切り替え方式

Traditional dial change-over system

試験力の切替はダイヤルを回転することにより簡単に切
り換わるダイヤル方式です。試験力用の重垂も含め防塵
タイプの設計になっています。

Dial change-over system make change the test load easily
by turning the dial. Accordingly the design is dust-proof
including the weights for test load.

機能 もぐり深さ表示

Display depth

通常測定画面でもぐり深さを
確認することができます。

You can easily confirm depth on
a measuring mode display.

DPS	0.0
MAX	0.0
CNT	0./999

DPS=最終もぐり深さ
MAX=最大もぐり深さ





RMT-1

ロックウェル硬さ試験専用機

Rockwell hardness tester

初試験力：10kgf のみ

Preliminary test force: Only 10kgf

RMT-3

ロックウェル硬さ試験

スーパーフィシャル硬さ試験 兼用機

Rockwell hardness test & superficial hardness tester

初試験力：3kgf および 10kgf

Preliminary test force: 3 & 10kgf

主なメニュー画面のご紹介 Main menu display introduction

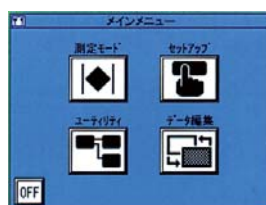


試験画面

Test mode screen

バーグラフ表示により初試験力を簡単にセットできます。

Preliminary test force can be easily set by displaying a bar graph display.



メインメニュー

Main menu

カラーで見やすくなったメニュー。よく使用する項目は測定モード画面からもすぐに表示できるようになりました。

Menu that came to become color and to see easily. From the test mode screen, you can now immediately display frequently used items.



試験データ表示

Test data display

データの確認、編集が画面上で簡単にできます。

You can easily check and edit the data on the screen.



トータルデータ表示

Total data display

ラインの品質管理に欠かせない工程能力指数もトータルデータで確認できます。

Indispensable process capability index for the quality control in the line can be confirmed on the total data screen.

製品ラインナップ Product Line-up

ART シリーズ 自動ロックウェル硬さ試験システム

ART Series / Automatic Rockwell hardness testing system



試験筒所にセット後、初試験力、追加試験力と自動で行う自動ロックウェル硬さ試験システムです。

付属PCへデータ出力し、多彩なデータ編集も可能です。

Automatic Rockwell Hardness Testing System is that does the Preliminary test and test force automatically after you set the location of testing. The data output is supplied to the PC, you can edit various.

フルオートシステム

Fully-automatic system



試料搬入、ロックウェル硬さ試験、試料搬出までフルオートで行う全自動システムです。ユーザーの様々なニーズに合わせて、フルオーダーメイドにて対応します。製作実績など詳しくは、弊社ホームページまで

This is a fully automated system to sample loading, Rockwell hardness test, sample unloading. The custom-made for the various needs of users. Production and performance information is available at our website.

仕様

SPECIFICATION

項目 ITEM		RMT-3			RMT-1		
初試験力 Preliminary test force		29.42 3	98.07 10	N kgf	98.07 10	N kgf	
追加試験力 Test force	RMT-1	588.4 60			980.7 100	1471 150	N kgf
	RMT-3	147.1 15	294.2 30	441.3 45	588.4 60	980.7 100	1471 150
初試験力セット Preliminary test force setting		自動セット方式、LCD グラフ表示、電子音モニター (微調整不要) Automatic setting.(LCD graph and electronic signal monitoring fine adjustment is unnecessary.)					
試験力制御方式 Test force control		自動 (負荷→保持→解除) Automatic>Loading→Holding→Release					
スタート方式 Start operation		オートスタート / マニュアルスタート切替式 Automatic start/Manual start selection					
試験力保持時間 Test force dwell time		3~99 sec.					
プラスチック試験設定 Plastic test function		標準装備 ワンタッチ切替式 硬度表示タイマー (3~99 秒) Standard function,time up to hardness value display after release:3 to 99 sec.					
試験スケール Test scale		15N 30N 45N 15T 30T 45T 15W 30W 45W 15X 30X 45X 15Y 30Y 45Y C D A G B F K E H P M L V S R			C D A G B F K E H P M L V S R		
データ出力 Data output		① セントロニクス (標準装備) Centronics(standard) ② RS232C 又はシリアル 工場出荷時選定 指示なき場合は RS232C RS232C or Serial output selectable.(Factory setting:RS232C)					
データメモリ機能 Data memory		最大 999 Max.999 test data					
硬度換算機能 Hardness conversion		SAE J417b,ASTM E 140 に規定の換算をリアルタイム表示 Based on SAE J417b, ASTM E 140.					
合否判定機能 OK/NG criteria		OK/NG で表示 (最大値・最小値設定) Upper and lower limits setting and HI/OK/LOW display.					
統計演算 Statistical calculation		最大値、最小値、ばらつき、平均、標準偏差、工程能力指数の統計演算を行い、 他のスケールへの換算値においても統計演算を行う。 Batch conversion of memorized data.(Max.value,Min.value,dispersion(R),mean value) Converted value,same too.					
通信フォーマット設定 RS232C communication line		伝送速度: 1200/2400/4800/9600 bps の選択 誤り検出、偶数パリティ / パリティ無し選択 Baud rate:1200/2400/4800/9600 bps selectable Error detection,Parity even/Parity none selectable					
精度 Accuracy		JIS B7726,ASTM E-18 準拠 Conform to JIS B7726 and ASTM E-18					
試料最大高 Max.Specimen height		200mm					
試料最大奥行 Max.Specimen depth		165mm					
機体寸法 Dimensions		W220×D540×H830mm					
機体重量 Weight		100kg					
使用電源 Power supply		国内 :AC100V 50/60Hz, 海外 :100~240V 50/60Hz 単相 Single phase AC100~240V 50/60Hz available for export models.					



硬さ標準片 Hardness standard block

Hardness standard block(standard or optional accessories)



ダイヤモンドスポット Diamond Anvil

(optional accessories; code# R106)



各種アンビル Anvil

(standard accessories; code# R101,105)
(optional accessories; code# R102,103,104,106)



圧子 Indenter

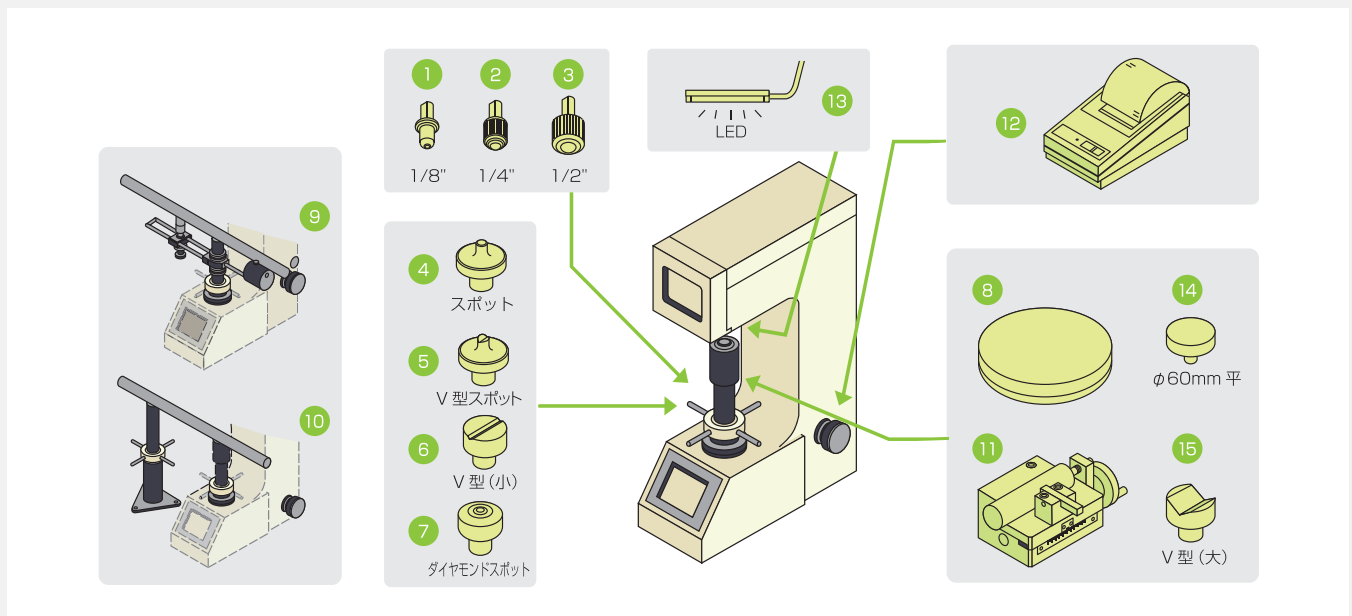
(standard accessories; code# R001,R002,R011)
(optional accessories; code# R012,013,014)

標準付属品 STANDARD ACCESSORIES

コード No Code No.	項目 ITEM		RMT-3	RMT-1
-	硬さ基準片 Hardness standard block	60~70HRC		1
-		85~100HRB		1
-		74~80HR30N	1	-
-		70~82HR30T	1	-
R001	ダイヤモンド圧子 (ロックウェル用 / 本体装備) Diamond indenter(Built in/for Rockwell)		-	1
R011	ダイヤモンド圧子 (ツイン用 / 本体装備) Diamond indenter(Built in/for Twin)		1	-
R002	鋼球圧子 (1/16"φ) Steel ball indenter(1/16"φ)			1
R021	予備鋼球 (1/16"φ) Spare steel ball(1/16"φ)			10
R101	アンビル Anvil	φ60mm 平 φ60mm flat ⑭		1
R105		V型 (大) V-shape large ⑮		1
-	予備ヒューズ Spare fuse 100~120 5A,200~240 5A			2
C031	電源コード (3P-2.5m) Power cord (3P-2.5m)			1
-	水平調整用脚 Level adjusting leg			4
-	補助工具一式 Auxiliary tools			1
-	転倒防止用具 Attachment for prevent the machine fall			2
V161	機体カバー Machine cover			1
-	取扱説明書 (基本&応用) 一式 Instruction manual(Basic&Application)			1
-	検査成績書 Inspection sheet			1

特別付属品 OPTIONAL ACCESSORIES

コードNo Code No.	項目 ITEM	内容 CONTENTS
R012	1/8 インチ鋼球圧子 Steel bell indenter ①	K,E,H,45W,30W,15W スケール用 For K,K,E,H,45W,30W,15W scale
R013	1/4 インチ鋼球圧子 Steel bell indenter ②	P,M,L,45X,30X,15X スケール用 For P,M,L,45X,30X,15X scale
R014	1/2 インチ鋼球圧子 Steel bell indenter ③	V,S,M,45Y,30Y,15Y スケール用 For V,S,M,45Y,30Y,15Y scale
-	超硬鋼球圧子 Tungsten carbide ball indeter	1/16",1/8",1/4",1/2"
R022	1/8 インチ鋼球 (10 個入り) Steel ball	鋼球のみ、予備用、交換用などに Steel ball for spare
R023	1/4 インチ鋼球 (10 個入り) Steel ball	鋼球のみ、予備用、交換用などに Steel ball for spare
R024	1/2 インチ鋼球 (10 個入り) Steel ball	鋼球のみ、予備用、交換用などに Steel ball for spare
R102	アンビル Anvil ④	スポット Spot Anvil
R103	アンビル Anvil ⑤	V 型スポット V-shape anvil
R104	アンビル Anvil ⑥	V 型 (小) V-shape anvil small
R106	アンビル Anvil ⑦	ダイヤモンドスポット Diamond anvil
R111	丸テーブル Round table ⑧	Φ200mm (熱処理無し) (No heat - treatment)
R131	長物測定治具 Long specimen testing fixture ⑨	バリレスト (V 型 (大) アンビル付き) Vari-rest (With V-shape anvil large)
R132	長物測定治具 Long specimen testing fixture ⑩	ジャッキレスト (V 型 (大) アンビル付き) Jack-rest (With V-shape anvil large)
R121	ジョミニー試験用手動ステージ Micro test table for jominy test ⑪	規定寸法のジョミニー試験片をワンタッチで固定し、 Max.Movement:Apporox.55mm 手動にてミリまたはインチ単位で微動送りできるステージ。 Min.micrograduation:1/10mm or 1/60"
C001 C002	プリンタ CBM-910 II Printer CBM-910 II ⑫	硬さ試験機本体での集計・演算結果を出力印字。 From hardness tester adding up results to data output. 100V 用 : C001 120/230V 用 : C002 for AC100V : C001 for AC120/230V : C002
-	照明装置 (LED) Lighting device ⑬	測定位置確認用照明 For testing position confirmation
-	硬さ基準片 Hardness standardized blocks	スケールごとに各種ご用意 ※別途ご相談下さい Various*ask for details
S001	データ通信ソフトウェア (HARDCOM) Data Communication Software (HARDCOM)	硬さ試験機のデータを Microsoft excel へ出力 (対応バージョン: excel2010 まで、対応 OS: Windows2000, XP, Vista, 7) Data of hardness tester are transmitted to Microsoft Excel directly. (Excel version:corresponds up to 2010 / OS:Windows2000,XP,Vista,7)



※カタログ記載の内容は 2011 年 1 月現在のもので、仕様・外観は予告無しに変更する場合があります。



MATSUZAWA 株式会社 マツザワ

〒019-2611 秋田県秋田市河辺戸島字七曲台 120-10
120-10, Aza-Nanamagaridai, Toshima, Kawabe, Akita-shi, Akita Pref, 019-2611, Japan
TEL.018-882-4580 FAX.018-882-4584
E-MAIL:support@matsuzawa-ht.com URL:http://www.matsuzawa-ht.com

- 東京連絡所 〒179-0073 東京都練馬区田柄2-43-1-506 TEL/FAX.03-3975-9216
- 西日本営業所 〒630-8136 奈良県奈良市恋の窪2-9-17 TEL.0742-32-5641 FAX.0742-34-7772
- 堺出張所 〒599-8261 堺市中区堀上町 288-11 TEL.072-276-1272 FAX.072-276-0505