



phase II+

The Source of Quality

Portable Hardness Testers • Bench Hardness Testers
Specialized Hardness Testers • Surface Roughness Testers
Ultrasonic Thickness Gauges • Coating Thickness Gauges
Force Gauges • Optical Visual Inspection • Vibration Meters



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- All our customer service representatives have on-line access to prices and inventory information.
- Parts available for 99% of our products.

For repairs and technical assistance contact our **Service Department**

- Our technical and product support department can assist you with difficult application problems and offer you trouble-shooting techniques.

Service and Quality

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Top Quality Products

Phase II offers only top quality products. Each new product passes a quality control checklist. We make sure our products live up to the high quality standards you have come to expect.

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We accept Visa, MasterCard, Discover

Prices: F.O.B. New Jersey unless advised otherwise. Minimum order is \$50 net.

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Orders: We ship 98% of our orders within 24 hours.

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UCI / Dynamic Hardness Tester

Non-Destructive!



Features:

- Non-Destructive hand held hardness tester
- Combines UCI and Leeb hardness testing in one state of the art device
- Test steel with min thickness of .08" and unlimited max thickness
- Blazing fast test results
- Rockwell, Brinell Vickers conversions shown on display
- Large Memory w/USB Output
- Choice of manual UCI probes; 1kg, 2kg, 5kg & 10kg
- Optional Motorized Probes: .30kg, .80kg, & 1kgf
- Available Impact Devices (Leeb) D, DC, D+15, G & DL

PHT-6000 Series

"**Ultrasonic Contact Impedance**" is based on a 136 degree diamond at the end of a vibrating rod being depressed into the test surface at a fixed load. The difference in Ultrasonic vibration frequency is then calculated into a hardness value. The UCI test procedure is slower than the Dynamic Impact style, however the "UCI" method of hardness testing is portable, easy and accurate. It also has its own advantages when utilized for certain testing applications. UCI testers are not restricted to large mass items like dynamic type testers. These units can test metals as thin as 1mm and at a hardness value as low as 20HRC (75HB). They also excel at performing hardness tests on larger, harder metals as well. Another reason for the rise in popularity is due to the fact that the UCI method is categorized as "Non-Destructive". That translates into less scrap parts/ lower mfg costs due to necessary inspections.

"**Dynamic Impact**" is based on the Leeb principle of hardness, developed by Dietmar Leeb in the 1970's. A spring loaded impact body is thrust to the test surface, effecting rebound. The speed of both the initial thrust and the rebound is measured in a non-contact mode. This is calculated as a Leeb hardness value and then automatically converted to Rockwell C, B, Brinell, Vickers and Shore Values. It has effectually brought easy, fast and accurate results to portable hardness testing.

UCI / Dynamic Hardness Tester

UCI

SCALES-UCI	MEASUREMENT RANGE	TOLERANCE
ROCKWELL C	20-70 HRC	EXCEEDS OR CONFORMS WITH ASTM A 1038
ROCKWELL B	41-99 HR	EXCEEDS OR CONFORMS WITH ASTM A 1038
ROCKWELL A	61-85 HRB	EXCEEDS OR CONFORMS WITH ASTM A 1038
BRINELL	76-618 HB	EXCEEDS OR CONFORMS WITH ASTM A 1038
VICKERS	80-1599 HV	EXCEEDS OR CONFORMS WITH ASTM A 1038

LEEB

SCALES-UCI	MEASUREMENT RANGE	TOLERANCE
ROCKWELL C	25-67 HRC	EXCEEDS OR CONFORMS WITH ASTM A 956
ROCKWELL B	59-99 HRB	EXCEEDS OR CONFORMS WITH ASTM A 956
BRINELL	85-651 HB	EXCEEDS OR CONFORMS WITH ASTM A 956
VICKERS	83-976 HV	EXCEEDS OR CONFORMS WITH ASTM A 956
SHORE	26-99HS _t	EXCEEDS OR CONFORMS WITH ASTM A 956
Leeb	170-960HLD	EXCEEDS OR CONFORMS WITH ASTM A 956

Can also test in the following scales:
 HRN15 - HRN30 - HRN45 - HRT15 - HRT30 - HRT45
 HRF - HK - HD.

UCI hardness tester w/manual probe

MODEL NO.	DESCRIPTION	MODEL NO. DESCRIPTION APPLICATION NOTES
PHT-6001	UCI Hardness Tester w/1kgf Probe	For use on polished surfaces. Below Ra 125µin
PHT-6002	UCI Hardness Tester w/2kgf Probe	For use on smooth surfaces. Below Ra 200µin
PHT-6005	UCI Hardness Tester w/5kgf Probe	For use on machined surfaces. Below Ra 400µin
PHT-6010	UCI Hardness Tester w/10kgf Probe	For use on rough surfaces. Below Ra 600µin

UCI hardness tester w/motorized probe

MODEL NO.	DESCRIPTION	MODEL NO. DESCRIPTION APPLICATION NOTES
PHT-6030	UCI Hardness Tester w/.30kgf Probe	Best for checking coating layer hardness; Finished thin parts
PHT-6080	UCI Hardness Tester w/.80kgf Probe	Best for smooth bearing type surfaces
PHT-6100	UCI Hardness Tester w/1kgf Probe	Best for machined surfaces

Specifications:

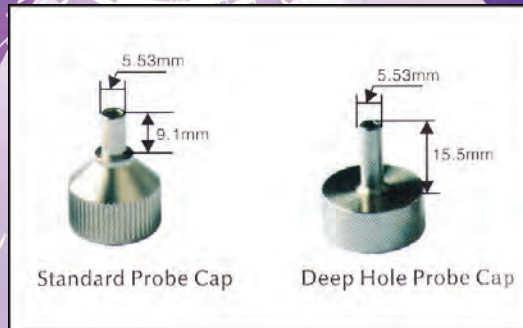
- **Hardness Range:** HRC:20-70, HRB: 55-100, HB: 100-739, HV: 100-2970
- **Scale Selection:** Rockwell C (HRC); Rockwell B (HRB); Rockwell A (HRA); Brinell (HB); Vickers (HV); Leeb (HLD) and many more
- **Tolerance:** Exceeds or conforms to relevant ASTM Standard
- **Display Type:** LCD Color Screen w/Backlight, adjustable brightness
- **Language Selection:** English, German, Chinese, Spanish, etc.
- **Data Logger:** Letters, Numerals
- **Data Memory:** 2000 groups of measured data ; 20 groups of calibration data
- **Statistical Software:** Supplied-can be saved in Word or Excel
- **Data Output:** USB - cable supplied
- **Power Supply:** Rechargeable Lithium Battery: Voltage-4.2V, 4800mAh
- **Auto Power Off:** 5 minutes
- **Recharging Time:** Approx. 8 hours
- **Battery Usage:** Approx. 6 hours (no backlight)
- **Net Weight(base unit):** 2lbs (w/probe)
- **Gross Weight** 12 lbs
- **Unit Dimensions** 7.0 x 3.1 x 1.1" (160x80x30mm)
- **Gross Dimensions** 13.7 x 17.7 x 5.9" (350x450x150mm)

Meets or Exceeds ASTM A1038 (UCI) and ASTM A956 (Leeb)

4 UCI / Dynamic Hardness Tester

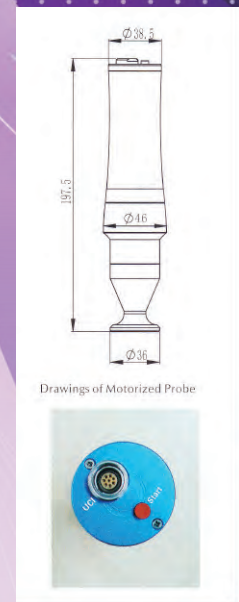
Manual UCI Probe Specifications:

PROBE TYPE/MODEL	PHT-6001	PHT-6002	PHT-6005	PHT-6010
LOADING FORCE	1kgf (10N)	2kg (20N)	5kg (50N)	10kg (98N)
PROBE DIAMETER	22mm	22mm	22mm	22mm
LENGTH	154mm	154mm	154mm	154mm
OSCILLATING ROD DIAMETER	2.4mm	2.4mm	3mm	3mm
SURFACE ROUGHNESS REQUIREMENTS μm =Metric μin =Inch	$R_a < 3.2 \mu\text{m}$ ($R_a < 125 \mu\text{in}$)	$R_a < 5 \mu\text{m}$ ($R_a < 197 \mu\text{in}$)	$R_a < 10 \mu\text{m}$ ($R_a < 393 \mu\text{in}$)	$R_a < 15 \mu\text{m}$ ($R_a < 590 \mu\text{in}$)
MIN WEIGHT OF TEST SAMPLE	0.3kg (.66lbs)	0.3kg (.66lbs)	0.3kg (.66lbs)	0.3kg (.66lbs)
MINIMUM THICKNESS OF SAMPLE	2mm (.08")	2mm (.08")	2mm (.08")	2mm (.08")



Motorized UCI Probe Specifications:

PROBE TYPE/MODEL	PHT-6030	PHT-6080	PHT-6100
LOADING FORCE	.30kg (3N)	.80kg (8N)	1kgf (10N)
PROBE DIAMETER	46mm	46mm	46mm
LENGTH	198mm	198mm	198mm
OSCILLATING ROD DIAMETER	3.7mm	3.7mm	3.7mm
SURFACE ROUGHNESS REQUIREMENTS μm =Metric μin =Inch	$R_a < 3.2 \mu\text{m}$ ($R_a < 125 \mu\text{in}$)	$R_a < 5 \mu\text{m}$ ($R_a < 197 \mu\text{in}$)	$R_a < 8 \mu\text{m}$ ($R_a < 314 \mu\text{in}$)
MIN WEIGHT OF TEST SAMPLE	0.3kg (.66lbs)	0.3kg (.66lbs)	0.3kg (.66lbs)
MINIMUM THICKNESS OF SAMPLE	2mm (.08")	2mm (.08")	2mm (.08")



INDENTATION DEPTH (μm)

HARDNESS	.30KG MOTORIZED	.80KG MOTORIZED	1 KG MOTORIZED	1 KG MANUAL	2 KG MANUAL	5 KG MANUAL	10 KG MANUAL
800HV	4	5	7	7	10	15	22
600HV	4	5	8	8	11	18	25
500HV	5	6	9	9	12	19	27
300HV	6	8	11	11	16	25	35
100HV	10	13	19	19	27	43	61

UCI / Dynamic Hardness Tester

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IMPACT DEVICES	D/DC/DL	D+15	C	G
IMPACT ENERGY	11Nmm	11Nmm	3Nmm	90Nmm
MASS OF THE IMPACT BODY	5.5g	7.8g	3.0g	20g
	DL: 7.3g			
TEST TIP				
* Hardness	1600HV	1600HV	1600HV	1600HV
* Diameter	3mm	3mm	3mm	5mm
* Material		Tungsten carbide	Tung carbide	
IMPACT DEVICE				
* Diameter	20mm	20mm	20mm	30mm
* Length	147/86mm	162mm	141mm	254mm
* Weight	75/50g	80g	75g	250g
MAX. HARDNESS OF SAMPLE	940HV	940HV	1000HV	650HB
PREPARATION OF SURFACE				
* Roughness class ISO	N7	N7	N5	N9
* Max. roughness depth Rt	10 mm	10 mm	2.5 mm	30 mm
* Average roughness Ra	2 mm	2 mm	0.4 mm	7 mm
MIN. WEIGHT OF SAMPLE				
* Of compact shape	5kg	5kg	1.5kg	15kg
* On solid support	2kg	2kg	0.5kg	5kg
* Coupled on plate	0.1kg	0.1kg	0.02kg	0.5kg
MIN. THICKNESS OF SAMPLE				
Suggested min. Thickness Range	12mm	10mm	10mm	12mm
* Min. thickness of layers	0.8mm	0.8mm	0.2mm	—
INDENTATION OF TEST TIP				
With 300 HV				
* Diameter	0.54mm	0.54mm	0.38mm	1.03mm
* Depth	24 m m	24 m m	12 m m	53 m m
With 600 HV				
* Diameter	0.45mm	0.45mm	0.32mm	0.90mm
* Depth	17 m m	17 m m	8 m m	41 mmC
With 800 HV				
* Diameter	0.35mm	0.35mm	0.30mm	—
* Depth	10mm	10mm	m7mm	—



SPECIAL APPLICATION IMPACT DEVICES

Impact Device D Part No. PHT1800-100

Universal standard device:

Use for the majority of hardness testing assignments

Impact Device DL Part No. PHT1800-115

Needle front section .109" diameter x 1.96" length

Measurements in extremely confined spaces

Impact Device G Part No. PHT1800-125

Enlarged test tip: For use on solid heavy components such as; rough castings and forgings. Brinell only.

Impact Device DC Part No. PHT1800-120

Extremely short impact device

Used for very confined spaces such as holes, cylinders, internal measurements

Impact Device D+15 Part No. PHT1800-110

Slim front section with coil set back.

Hardness measurements in grooves, recessed surface.

Impact Device C

A reduced energy impact device for measuring the hardness of Case Hardened Steel only. Applies a small superficial indentation.

Weight: 2.6oz³

Part No. PHT1800-130

Probe Support Stand MET-1000



Part No. PHT6000-511
Flat Support Ring
(manual probe)



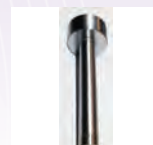
Part No. PHT6000-521
V-Groove Adapter
(manual probe)



Part No. PHT6000-711
Std Support Cap
(manual probe)



Part No. PHT6000-721
Deep Hole Adapter
(manual probe)



Part No. PHT6000-731
Deep Hole Adapter
(moto probe)



Part No. PHT6000-751
V-Groove Adapter
(moto probe)

UCI / Dynamic Hardness Tester

Optional Test Blocks for 6000 Series

NIST Certified Test Block Kit

Part No. 900330-9410

Includes: 1pc HRC 20's

1pc HRC 40's

1pc HRC 60's



Aluminum/Brass Rockwell Blocks

PART NO.	DESCRIPTION	SHAPE	RANGE	COMMENTS
900330-9414AH	Rockwell B	Square	80's	Made in USA Aluminum
900330-9414AL	Rockwell B	Square	50's	Made in USA Aluminum
900330-9418H	Rockwell E	Square	90's	Made in USA Aluminum
900330-9418L	Rockwell E	Square	60's	Made in USA Aluminum
900330-9414BH	Rockwell B	Square	80's	Made in USA Brass
900330-9414BL	Rockwell B	Square	50's	Made in USA Brass



Standard Leeb Test Blocks

PART NO.	DESCRIPTION	RANGE
PHT1300-01	Standard Leeb "D" Test Block	750-800(HRC 50's)
PHT1300-02	Standard Leeb "D" Test Block	750-800(HRC 50's)
PHT1300-03	Standard Leeb "D" Test Block	590-670(HRC40's)
PHT1300-05	Standard Double Sided Leeb "D" Test Block	590-670(HRC40's)
PHT1100G-01	Standard Leeb "G" Test Block	490-570(HRC20's)



NIST/ASTM Certified Leeb Test Blocks: Comes with full form certificates

PART NO.	DESCRIPTION	RANGE
PHT130001-CERT	NIST Certified Leeb "D" Test Block	750-800HLD (HRC 50's)
PHT130002-CERT	NIST Certified Leeb "D" Test Block	590-670HLD (HRC 40's)
PHT130003-CERT	NIST Certified Leeb "D" Test Block	490-570HLD (HRC 20's -90'sHRB)
PHT1100G-01C	ASTM Certified Leeb "G" Test Block	400's HLG (200's HB)

Brinell Test Blocks

PART NO.	DESCRIPTION	SHAPE	RANGE	COMMENTS
900355-1000/150	3000kg	Round	150-250	Phase II std. (Steel)
900355-1000/250	3000kg	Round	250-500	Phase II std. (Steel)
900355-3010	3000kg	Rectangle	Low	Aluminum (USA)
900355-3020	3000kg	Rectangle	High	Aluminum (USA)
900355-3030	3000kg	Rectangle	100-200HB	Steel (USA)
900355-3040	3000kg	Rectangle	250-350HB	Steel (USA)
900355-3050	3000kg	Rectangle	500+HB	Steel (USA)



Ultrasonic Hardness Tester

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New! Mini-MET's



Standard Accessories:

- Base Instrument
- Calibrated Test Blocks
- Custom Carry Case
- Battery Charger
- Operation Manual

Specifications:

- Easy To Read Menu Operation
- Large LCD Display w/ Back Light
- USB Interface
- Automatic Mean Value
- Data Archive Capacity

Specifications:

Tolerance: +/- 3%
Minimum Thickness of sample: .040"
Materials: steel & cast steel, alloy tool steel, stainless steel, aluminum, brass, bronze, wrought copper alloy.
Battery type: NiMH Re-Chargeable
Operating temperature: 5-104 degrees F
Weight: 650g

Meets ASTM1038-10 specifications



Non-Destructive Hardness Testing!

MODEL	SCALES	PRESSURE FORCE	MEASUREMENT RANGE
MET-HRC15	Rockwell C	50N (5kgf)	20-70 HRC
MET-HRC50	Rockwell C	50N (5kgf)	20-70 HRC
MET-HB50	Brinell	50N (5kgf)	75-650 HB
MET-HV15	Vickers	10N (1.5kgf)	75-1000 HV

MET-MINI

Designed to test specific material in a chosen scale, the new PHASE II miniature ultrasonic hardness testers are capable of measuring surface hardness of metals with flat, thin, round or large surfaces. Accurate measurements of steels and aluminum are easily attained with these compact instruments. "

Portable Hardness Tester



Meets ASTM A956 specifications

Optional Accessories Pg. 17		
12 Piece Ring Set for Tough Radii PHT1500-300 	Double-Sided Test Block PHT1300-05 	NIST Certified Test Block PHT130001-CERT 

CHECK PAGE 16 FOR OPTIONAL IMPACT DEVICE PROBES

PHT-1800

PHT-1800C

w/NIST Certified Test Block

PHT-1840 - W/DL IMPACT DEVICE

PHT-1850 - W/G IMPACT DEVICE

State of the art, digital tester is designed to test the hardness of large hard metal parts. Loaded with useful functions only found on high priced models the PHT-1800 is clearly setting a new industry standard by being the most accurate, economically priced hardness tester on the market today. Fast test speeds coupled with memory and output, this unit is a hands down winner whether you are out in the field or in the QC shop. The PHT-1800 can perform tests that easily convert to the most popular hardness scales, including Rockwell, Brinell, Vickers, Shore, etc. Meets ASTM A956 specifications

Operation:

- Load the impact body
- Place the impact body on your test piece
- Push the button to begin testing and obtain reading

Standard Accessories:

- Base instrument
- Impact device D
- Calibrated test block
- Custom carry case
- Cleaning brush
- Operation manual

Optional accessories:

- Impact devices; DC, D+15, DL, G, C
- Special support rings
- Mini Printer

Functions:

- Easy to use keypad operation
- Auto identification of Impact Device

- Large LCD display with back light
- USB Output
- Automatic conversions to: Brinell, Rockwell B & C, Vicker and Shore
- Automatic mean value as well as Min & Max values
- Battery Indicator
- Memory capacity (100 groups)

Specifications:

- Accuracy: +/- 0.5% HL
- Measuring range: 200-960 HL
- Materials: steel & cast steel, alloy tool steel, stainless steel, grey cast iron,
- Spheroidal iron, cast aluminum, brass, bronze, wrought copper alloy.
- Battery type: AA alkaline (4)
- Operating temperature: 5-104 degrees F
- Dimensions: 150 x 74 x 32mm
- Shipping Weight: 10 lbs.

Portable Hardness Tester With Color Screen



Optional Accessories Pg. 17		
12 Piece Ring Set for Tough Radii PHT1 500-300	Double-Sided Test Block PHT1 300-05	NIST Certified Test Block PHT1 30001-CERT



Meets ASTM A956 specifications



Operation:

- Load the impact body
- Place the impact body on your test piece
- Push the button to begin testing and obtain reading

Standard Accessories:

- Base instrument
- Impact device D
- Calibrated test block
- Custom carry case
- Cleaning brush
- Operation manual

Optional accessories:

- Impact devices; DC, D+15, DL, G, C
- Special support rings

Functions:

- Easy to use keypad operation
- Auto identification of Impact Device

- Large LCD display with back light
- USB Output
- Automatic conversions to: Brinell, Rockwell B & C, Vicker and Shore
- Automatic mean value as well as Min & Max values
- Battery Indicator
- Memory capacity (100 groups)

Specifications:

- Accuracy: +/- 0.5% HL
- Measuring range: 200-960 HL
- Materials: steel & cast steel, alloy tool steel, stainless steel, grey cast iron, Spheroidal iron, cast aluminum, brass, bronze, wrought copper alloy.
- Battery type: AA alkaline (4)
- Operating temperature: 5-104 degrees F
- Dimensions: 150 x 74 x 32mm
- Shipping Weight: 10 lbs.

CHECK PAGE 16 FOR OPTIONAL IMPACT DEVICE PROBES

PHT-1900

State of the art, digital portable hardness tester is designed to test the hardness of large hard metal parts. Clean crisp display shows the incredible functions that can only be found on this new portable hardness tester such as auto-probe detection, auto direction detector, single and multi-point calibration make the new 1900 the most versatile portable hardness tester in the industry.

10 New RUGGED Aluminum Body Hardness Tester.



The PHT-2100 can perform tests that easily convert to the most popular hardness scales, including Rockwell, Brinell, Vickers, Shore, etc.

CHECK PAGE 16 FOR OPTIONAL IMPACT DEVICE PROBES

Meets ASTM A956 specifications

PHT-2100

Our new rugged "extruded aluminum" frame portable hardness tester is suited for rough environments such as mining facilities, pipeline, bridge and tower inspections, etc and is packed with features typically found on high end models only. This new leeb hardness tester is designed to test the hardness of large hard metal parts. Loaded with useful functions only found on high priced models the PHT-2100 is clearly setting a new industry standard by being the most accurate, economically priced hardness tester on the market today. Fast test speeds coupled with memory and output, this unit is a hand's down winner whether you are out in the field or in the QC shop.

Designed to test large hard parts: Example: Tool steel should be close to 1" thick of solid material

Operation:

- Load the impact device
- Place the impact device on your test piece
- Push the button to begin testing and obtain reading

Standard Accessories:

- Base instrument
- Impact device D
- Calibrated test block
- Custom carry case
- Cleaning brush
- Operation manual

Optional accessories:

- Impact devices: DC, D+15, DL, G, C
- Special support rings convex/concave surfaces

Functions:

- Easy to use keypad operation
- Auto identification of Impact Device
- Large LCD display with back light

• USB Output

- Automatic conversions to: Brinell, Rockwell B & C, Vicker and Shore
- Automatic mean value as well as Min & Max values
- Battery Indicator
- Memory capacity (100 groups)

Specifications:

- Accuracy: +/- 0.5% (referred to L=800,
- Repeatability accuracy: +/- 4L units) L=Leeb
- Measuring range: 200-960 HL
- Materials: steel & cast steel, alloy tool steel, stainless steel, grey cast iron, spheroidal iron, cast aluminum, brass, bronze, wrought copper alloy
- Battery type: AA alkaline (2)
- Operating temperature: 5-104 degrees F
- Dimensions: 150 x 74 x 32mm
- Weight: 245 grams

Economy Hardness Tester 11



Meets ASTM A956 specifications



Operation:

- Load the impact body
- Place the impact body on your test piece
- Push the button to begin testing and obtain reading

Standard Accessories:

- Base instrument
- Impact device D ("DL" PHT-1740) ("G" PHT-1750)
- Calibrated test block
- Custom carry case
- Cleaning brush
- Operation manual
- USB cable

Functions:

- Easy to use push button operation
- Large LCD display with back light
- Automatic conversions to: Brinell, Rockwell, Vicker and Shore
- Automatic mean value
- Data storage capacity

Specifications:

- Accuracy: +/- 0.5% HL
- Measuring range: 200-960 HL
- Materials: steel & cast steel, alloy tool steel, stainless steel, grey cast iron, spheroidal iron, cast aluminum, brass, bronze, wrought copper alloy.
- Battery type: AAA alkaline (2)
- Operating temperature: 5-104 degrees F
- Dimensions: 108 x 62 x 25mm
- Shipping Weight: 11 lbs.

Optional Accessories Pg. 17

12 Piece Ring Set for Tough Radii
PHT1500-300



Double-Sided Test Block
PHT1300-05



NIST Certified Test Block
PHT130001-CERT



CHECK PAGE 16 FOR OPTIONAL IMPACT DEVICE PROBES

PHT-1700

Loaded with features, this economically priced hardness tester is capable of measuring the surface hardness of a broad variety of metals on flat and round surfaces. This instrument comes complete with the universal D impact device, calibrated test block and rugged carry case.

PHT-1740

Same base instrument as the PHT-1700 but comes supplied with the "DL" impact device for testing of gear teeth, grooves and other confined applications. See page 15.

PHT-1750

Same base instrument as the PHT-1700 but comes supplied with the "G" impact device for testing of large castings and rough porous parts. See page 15.

12 Portable Hardness Tester w/ Printer



The PHT-3500 can perform tests that easily convert to the most popular hardness scales, including Rockwell, Brinell, Vickers, Shore, etc.



Meets ASTM A956 specifications

Optional Accessories Pg. 17		
<p>12 Piece Ring Set for Tough Radii PHT1500-300</p>	<p>Double-Sided Test Block PHT1300-05</p>	<p>NIST Certified Test Block PHT130001-CERT</p>

Operation:

- Load the impact body
- Place the impact body on your test piece
- Push the button to begin testing and obtain reading

Standard Accessories:

- Base instrument
- Impact device D
- Calibrated test block
- Custom carry case

- Cleaning brush
- Operation manual

Optional accessories:

- Impact devices: DC, D+15, DL, G, C
- Special support rings

Functions:

- Easy to use keypad operation
- Auto identification of Impact Device
- Large LCD display with back light
- USB Output
- Automatic conversions to: Brinell, Rockwell B & C, Vicker and Shore
- Automatic mean value as well as Min & Max values
- Upper/Lower Limit Setting w/Alarm
- Battery Indicator
- Memory capacity (500 groups)

Specifications:

- Accuracy: +/- 0.5% HL
- Measuring range: 200-960 HL

- Minimum Thickness: < 0.5" (Steel)
- Materials: steel & cast steel, alloy tool steel, stainless steel, grey cast iron,
- spheroidal iron, cast aluminum, brass, bronze, wrought copper alloy.
- Battery type: 6V NiMh Rechargeable
- Battery charger: 9V/500mA
- Continuous working period of about 150 hours (With backlight off, no printing)
- Printing paper: width is (57.5±0.5)mm, diameter is 30mm
- Communication interface: USB1.1
- Operating temperature: 5-104 degrees F
- Dimensions: 212 x 80 x 32mm
- Shipping Weight: 12 lbs.

CHECK PAGE 16 FOR OPTIONAL IMPACT DEVICE PROBES

PHT-3500

State of the art, digital tester is designed to test the hardness of large hard metal parts. Loaded with useful functions and a built in mini-printer the PHT-3500 is clearly the industry leader for fast accurate hardness testing with advanced thermal printing capabilities.

Meets ASTM A956 Specifications

Mini-Integrated Hardness Tester

13



Technical Specifications:

- Dimensions: 6.10" x 2.36" x 1.49" (155 X 60 X 38mm)
- Impact Device: D/DL
- Impact Energy: 8 Ft-Lbs (11nm)
- Test Tip: Tungsten Carbide
- Measuring Accuracy: +/- 0.8% (Corresponding To +/- 1 Hrc At Hrc=58)
- Max. Hardness Of Sample: 980hv
- Shipping Weight: 11 lbs.
- Impact Direction: Any Angle
- Operating Temperature: 32 To 122 Degrees F (0 To 50 Degrees C.)
- Min. Weight Of Sample: 11 lbs / 5kg
- Min. Radius Of Curved Surface: 1.2in (30mm) (With Support Rings:11mm)
- Power Supply: 3.6V Lithium Rechargeable Battery



Optional Accessories Pg. 17

12 Piece Ring Set for Tough Radii
PHT1500-300



Double-Sided Test Block
PHT1300-05



NIST Certified Test Block
PHT130001-CERT



PHT-3300

PHT-3340 W/ DL IMPACT DEVICE

The PHASE II hardness tester, Model No. PHT-3300 is an advanced integrated hardness tester distinguished by its very compact size, high accuracy, wide measuring range and simplicity of operation. It is suitable for testing the hardness of all metals and widely applied in many areas of industry.

The PHT-3300 as with all Leeb hardness testers, is designed to test very large hard parts. Steel should be close to 1" thick of solid material. Softer metals need even more mass.

The PHT-3300 hardness tester combines the universal impact device D and a data processor in a single unit. It automatically computes all Vickers, Brinell, Rockwell and Shore hardness values. USB output enables this new model to print any of it's memory from up to 500 groups. The impact direction can be set so that the accurate values can be achieved at any angle, even upside down! Statistical mean value is automatically provided.

The measuring method of the PHT-3300 is defined as "the quotient of the impact body's rebound velocity over its impact velocity". Optional accessories include various support rings to meet the requirements of specialized convex or concave applications. MEETS ASTM A956-12 SPECIFICATIONS.

Gear Teeth Hardness Tester

For Testing in Tight Spaces



PHT-1740



PHT-1840



PHT-3340

Meets ASTM A956 specifications

- Standard Accessories:**
- Base Instrument
 - Impact device DL
 - Calibrated Test Block
 - USB Output Cable & Software
 - Carry Case
 - Operation Manual

Optional Accessories Pg. 17		
12 Piece Ring Set for Tough Radii PHT1500-300 	Double-Sided Test Block PHT1300-05 	NIST Certified Test Block PHT130001-CERT 

PHT-1740

This dedicated unit is designed to test gear teeth and other difficult to access applications. The 1740 is an economically priced hardness tester that is loaded with the same features found on the base 1700 version. The 1740 hardness tester is capable of measuring the surface hardness of a broad variety of metals on flat and round surfaces. This instrument comes complete with a dedicated DL impact device, calibrated test block and rugged carry case.

PHT-1840

This dedicated unit is designed to test gear teeth and other difficult to access applications. The 1840 is loaded with the same features found on the base 1800 version which includes memory, USB output and software for downloading to your PC. The 1840 hardness tester is capable of measuring the surface hardness of a broad variety of metals on flat and round surfaces. This instrument comes complete with a dedicated DL impact device, calibrated test block and rugged carry case.

PHT-3340

This integrated unit is designed to test gear teeth and other difficult to access applications. The 3340 hardness tester is capable of measuring the surface hardness of a broad variety of metals on flat and round surfaces. This instrument comes complete with a dedicated DL impact device, calibrated test block and rugged carry case.

Portable Hardness Testers

15

For Testing Porous Castings and Very Rough Surfaces



PHT-1850

PHT-1750



Meets ASTM A956 specifications

Standard Accessories:

- Base instrument
- Impact device G
- Calibrated test block
- Custom carry case
- Cleaning brush
- Operation manual

Specifications:

- **Accuracy:** +/- 0.5% HL
- **Measuring range:** 200-960 HL
- **Materials:** steel & cast steel, alloy tool steel, stainless steel, grey cast iron, spheroidal iron, cast aluminum, brass, bronze, wrought copper alloy.
- **Battery type:** AA alkaline (4)
- **Operating temperature:** 5-104 degrees F
- **Dimensions:** 150 x 74 x 32mm
- **Shipping Weight:** 20 lbs.

Operation:

- Load the impact body
- Place the impact body on your test piece
- Push the button to begin testing and obtain reading

Functions:

- Easy to use keypad operation
- Auto identification of Impact Device
- Large LCD display with back light
- Automatic mean value as well as Min & Max values
- Battery Indicator
- Memory capacity (100 groups)

IMPACT DEVICE	G
IMPACT ENERGY	90 Nm
MASS OF THE IMPACT BODY	20g
TEST TIP	
* Hardness	1600HV
* Diameter	5mm
* Material	Tungsten Carbide
IMPACT DEVICE	
Diameter	30mm
Length	254mm
Weight	250g
MAX HARDNESS OF SAMPLE	650HB
PREPARATION OF SURFACE	
* Max. roughness depth Rt	30 µm
* Average roughness Ra	6.3 µm
PREPARATION OF SURFACE	
* Of compact shape depth Rt	15kg
* On solid support	5kg
* Coupled on plate	0.5kg
INDENTATION OF TEST TIP WITH 300 HV	
* Diameter	1.03mm
* Depth	53 µm
WITH 600 HV	
* Diameter	0.90mm
* Depth	41 µm

PHT-1750/1850

Hardness Testing for Rough Surfaces

Incorporates the "G" impact device mated to the popular PHT-1700 & 1800 portable hardness testers. This combination allows the user to test large rough surface parts and readout in the Brinell hardness scale.

16 Impact Devices for Portable Hardness Testers

IMPACT DEVICES	D/DC/DL	D+15	C	G
IMPACT ENERGY	11Nmm	11Nmm	3Nmm	90Nmm
MASS OF THE IMPACT BODY	5.5g	7.8g	3.0g	20g
	DL: 7.3g			
TEST TIP				
* <i>Hardness</i>	1600HV	1600HV	1600HV	1600HV
* <i>Diameter</i>	3mm	3mm	3mm	5mm
* <i>Material</i>		Tungsten carbide	Tung carbide	
IMPACT DEVICE				
* <i>Diameter</i>	20mm	20mm	20mm	30mm
* <i>Length</i>	147/86mm	162mm	141mm	254mm
* <i>Weight</i>	75/50g	80g	75g	250g
MAX. HARDNESS OF SAMPLE	940HV	940HV	1000HV	650HB
PREPARATION OF SURFACE				
* <i>Max. roughness depth Rt</i>	10 mm	10 mm	2.5 mm	30 mm
* <i>Average roughness Ra</i>	2 mm	2 mm	0.4 mm	7 mm
INDENTATION OF TEST TIP				
With 300 HV				
* <i>Diameter</i>	0.54mm	0.54mm	0.38mm	1.03mm
* <i>Depth</i>	24 m m	24 m m	12 m m	53 m m
With 600 HV				
* <i>Diameter</i>	0.45mm	0.45mm	0.32mm	0.90mm
* <i>Depth</i>	17 m m	17 m m	8 m m	41 mmC
With 800 HV				
* <i>Diameter</i>	0.35mm	0.35mm	0.30mm	—
* <i>Depth</i>	10mm	10mm	m7mm	—

"DC" Impact Device

Very short impact device for those confined areas, i.e. inside bores for internal measurements. Conforms to the D measuring range.

Weight: 1.8oz

Part No. PHT1800-120

"D" Impact Device

Universal standard unit. Will handle the majority of hardness testing applications.

Weight: 2.6oz

Part No. PHT1800-100

"D+15" Impact Device

Very narrow contact area with a set back measurement coil. This device is used to measure hardness in grooves and recessed surfaces.

Weight: 2.8oz

Part No. PHT1800-110

"G" Impact Device

This device has an enlarged test tip, and an increased impact energy range (approx. 9 times the D, 72 ft-lb.). Can be used on lower quality finishes for measuring hardness in the Brinell range only (max. 650 HB). Designed to be used with heavy components such as heavy castings and forgings.

Weight: 8.8oz

Part No. PHT1800-125

"DL" Impact Device

This model features a needle front section with a diameter of 4mm and a length of 50mm. It is suitable for testing in extremely confined spaces, the base of grooves and on special components such as gear wheels. For use on steel and cast steel only!

Weight: 3.0oz

Part No. PHT1800-115

"C" Impact Device

A reduced energy impact device for measuring the hardness of Case Hardened Steel only. Applies a small superficial indentation.

Weight: 2.6oz²

Part No. PHT1800-130



Leeb Test Blocks and 12 pc. Ring Set 17



Standard Leeb Test Blocks:

Model	Description	Range
PHT1300-01	Standard Leeb "D" Test Block	750-800HLD (HRC 50's)
PHT1300-02	Standard Leeb "D" Test Block	590-670HLD (HRC 40's) 590-670HLD
PHT1300-03	Standard Leeb "D" Test Block	490-570HLD (HRC 20's -90'sHRB)
PHT1300-05	Standard Double Sided Leeb "D" Test Block	750-800HLD (HRC 50's)
PHT1100G-01	Standard Leeb "G" Test Block	400's HLG (200's HB)

NIST/ASTM Certified Leeb Test Blocks: *Comes with full form certificates*

Model	Description	Range
PHT130001-CERT	NIST Certified Leeb "D" Test Block	750-800HLD (HRC 50's)
PHT130002-CERT	NIST Certified Leeb "D" Test Block	590-670HLD (HRC 40's)
PHT130003-CERT	NIST Certified Leeb "D" Test Block	490-570HLD (HRC 20's -90'sHRB)
PHT1100G-01C	ASTM Certified Leeb "G" Test Block	400's HLG (200's HB)



12pc Universal Support Ring Set PHT1500-300

This kit comes complete with 6-concave rings, 5 convex rings and 1- small stand for difficult to test round or curved parts.

18 Portable Rockwell Hardness Tester



**Load Cell, Closed Loop,
Rockwell Hardness Tester!**

**Touch Screen Functions w/One Touch
Testing Feature!**

**Meets ASTM E18 and E110
For NADCAP and API**

Entire Hardness Test Cycle Performed Automatically.

**Ascent of Load Shaft • Minor Load Application • Test Load Application/Hold/Release
Rockwell Hardness Display • Descent of Load Shaft**

- Direct Loading Method With Load-Cell Instead Of Dead Weight System.
- High Speed Test Cycle and Extremely Accurate Loading Control
- Automatic conversions to HB, HV, Superficial Rockwell Scales
- Touch Screen selectable system
- Upper/Lower Limit Settings

Minor Load	10 Kgf
Major Load	60 Kgf, 100 Kgf, 150 KGF
Test Force Application	Load Cell Closed Loop
Test Force Control	Motorized
Results Display	Hi Def LCD Digital Readout
Resolution	0.1HR
Minimum Thickness of sample	.56mm (0.024") STEEL
Throat Depth	5.90"
Height	170mm
Width	320mm
Depth	230mm
Weight	23 lbs

Features:

- Closed Loop Load cell control system affords highly sensitive and accurate readings
- Touch screen interface allows all functions to be easily set in the field
- True portability when paired with capable battery pack.
- Minimum specs shown below
kVA(rated output capacity): 1000VA/600W
Output voltage AC: 110V
Input voltage AC: 110V
Battery capacity: 12V/7AH *2 (or other capacity of your choice)
- Data Output: Supplied with flash drive for print out in Excel format
- Conversions: Superficial Rockwell, Brinell & Vickers

Accessories Included:

- C-scale Diamond Indenter
- 1/16" Ball Indenter
- 2- HRC test Blocks
- 1- HRB Test Block
- Portable Power Inverter
- Cast Iron Base
- Operation Manual
- Calibration Certificate

PHT-7000

This portable Rockwell hardness tester with fully automated load/unload procedures affords highly sensitive and accurate readings. Micro computer controlled Touch Screen with USB output to PC. The PHT-7000 portable Rockwell hardness tester offers programmable scale conversions, dwell times, statistical capabilities and test counter. Capable of testing in the most popular Rockwell hardness scales

Digital Rockwell Hardness Indicator 19



Features:

- Resolution: 0.1 HR
- Replace manual indicator directly
- Data memory is up to 999 readings
- Ready to measure immediately without calibration
- Scales convert automatically
- Auto power off

3 DIFFERENT MODELS AVAILABLE



Accuracy	±0.5HR
Resolution	0.1HR
Display	128 x 64 Graphic LCD with backlight
Memory	999 readings
Scales 900330-DI/ 900331-DI 900345-DI	HRC, HRA, HRB, HRD, HRE, HRF, HRG, HRK, HRH, HR15N, HR30N, HR45N, HR15T, HR30T, HR45T
Convert Scales	HB, HV
Power	Ni-H Rechargeable battery pack
Charger	Input: 100~240/50~60Hz; output 5V 1A/DC
Operating Environment	Temperature: -10°C~+50°C; Humidity: 20%~85%
Storage Environment	Temperature: -30°C~+70°C; Humidity: 5%~95%
Dimensions	114 x 37 mm
Weight	420g
Accessories	Charger
Standard	ASTM E18, ISO 6508

900330-9500 Digital Indicator for 900-330 & HR150

900331-9500 Digital Indicator for 900-331/Starrett 3814 & SPI 15-817-0

900345-9500 Digital Indicator for 900-345

Rockwell Scale Hardness Tester



NIST TRACEABLE



Included Accessories:

- C-scale Diamond Indentor
- 1/16" Ball Indentor
- 3- HRC Test Blocks
- 1- HRB Test Block
- 1-HRA Test Block
- Flat Anvil 2.5" (63mm)
- Std. Vee Anvil
- H/D Accessory Case
- Dust Cover

Options:

- NIST/ASTM certified test blocks, penetrators and kits are available. Please refer to pages 48-52.

**PLEASE CONTACT US
FOR DETAILS.**



900-331

This hardness tester comprises the very best in "state of the art" design coupled with dynamic precision only found at Phase II. The 900-331 Rockwell scale hardness tester is easy to operate yet engineered to obtain highly sensitive and accurate readings. A perfect, rugged performer suited for almost any environment including heat treat facilities, tool rooms, workshops, laboratories and inspection labs. Lifetime technical support is included on all Phase II Hardness Testers. So test away with confidence and a level of accuracy you will only find at Phase II.

Minor Load	10Kgf
Major Load	60Kgf, 100Kgf, 150Kgf
Test Force Application	Dead Weight
Test Force Control	Hydraulic Dashpot System
Results Display	Analog Dial Gage
Vertical Capacity	6.7 in.
Throat Depth	6.6 in.
Height	30.0 in.
Width	8.50 in.
Depth	20.0 in.
Shipping Weight	242 lbs.

Rockwell Scale Hardness Tester 21 with Digital Indicator



Included Accessories:

- C-scale Diamond Indentor
- 1/16" Ball Indentor
- 3- HRC Test Blocks
- 1- HRB Test Block
- 1-HRA Test Block
- Test Table 5.87" (150mm)
- Flat Anvil 2.5" (63mm)
- Flat Anvil 5.87"
- Std. Vee Anvil
- H/D Accessory Case
- Dust Cover

Minor Load	10Kgf
Major Load	60Kgf, 100Kgf, 150Kgf
Test Force Application	Dead Weight
Test Force Control	Hydraulic Dashpot System
Results Display	Analog Dial Gage
Vertical Capacity	6.7 in.
Throat Depth	6.6 in.
Height	30.0 in.
Width	8.50 in.
Depth	20.0 in.
Shipping Weight	242 lbs.

Options:

- NIST/ASTM certified test blocks, penetrators and kits are available. Please refer to pages 48-52.

**PLEASE CONTACT US
FOR DETAILS.**

900-331D

This hardness tester with digital indicator comprises the very best in "state of the art" design coupled with dynamic precision only found at Phase II. The 900-331D Rockwell scale hardness tester is easy to operate yet engineered to obtain highly sensitive and accurate readings. A perfect, rugged performer suited for almost any environment including heat treat facilities, tool rooms, workshops, laboratories and inspection labs. Lifetime technical support is included on all Phase II Hardness Testers. So test away with confidence and a level of accuracy you will only find at Phase II.

22 Tall Frame Rockwell Scale Hardness Tester

Included Accessories:

- C-scale Diamond Indentor
- 1/16" Carbide Ball Indentor
- 3- HRC Test Blocks
- 1- HRB Test Block
- 1-HRA Test Block
- Test Table 5.87" (150mm)
- Flat Anvil 2.5" (63mm)
- Std. "V" Anvil
- Accessory Case

Options:

- NIST/ASTM certified test blocks, penetrators and kits are available. Please refer to pages 48-52.

**PLEASE CONTACT US
FOR DETAILS.**

Features:

- 15 $\frac{3}{4}$ " Test height for extremely large parts
- Direct analog dial reading
- Advanced design, easy to operate
- Engineered to obtain highly sensitive and accurate readings



Minor Load	10Kgf
Major Load	60Kgf, 100Kgf, 150Kgf
Test Force Application	Dead Weight
Test Force Control	Hydraulic Dashpot System
Results Display	Analog Dial Gage
Vertical Capacity	15 $\frac{3}{4}$ " in.
Throat Depth	5.5 in.
Height	33.0 in.
Width	18.0 in.
Depth	70.0 in.
Shipping Weight	200 lbs.

900-332

The 900-332 Rockwell hardness tester is perfectly designed for that large part application. It is easy to operate and engineered to take highly sensitive and accurate readings. Perfect for the shop floor, labs, heat treat facilities and tool rooms.

Superficial Rockwell Scale Hardness Tester 23



Options:

- NIST/ASTM certified test blocks, penetrators and kits are available. Please refer to pages 48-52.

PLEASE CONTACT US FOR DETAILS.

- Included Accessories:**
- N-scale Diamond Indentor
 - 1/16" Steel Ball Indentor
 - 3- HRN Test Blocks
 - 3-HRT Test Blocks
 - Test Table 5.87" (150mm)
 - Flat Anvil 2.5" (63mm)
 - Spot Anvil .38" (10mm)
 - Std. Vee Anvil
 - Accessory Case
 - Dust Cover

Test Force Control	Hydraulic Dash Pot
Results Display	Analog Dial
Vertical Capacity	6.7 in.
Throat Depth	6.6 in.
Height	28 in.
Width	8.9 in.
Depth	19.6 in.
Shipping Weight	190 lbs

Specifications:

Minor Load	3 Kgf
Major Load	15 Kgf, 30 Kgf, 45 Kgf
Test Force Application	Dead Weight

900-345

Just like our Phase II analog rockwell hardness tester, the 900-345 superficial rockwell hardness tester comprises the very best in "state of the art" design, coupled with dynamic precision only found at Phase II. Used for testing thin and soft metals in the superficial rockwell hardness scales, the 900-345 is easy to operate yet engineered to obtain highly sensitive and accurate readings. The 900-345 will offer unmatched repeatability in all superficial rockwell scales. A perfect, rugged performer suited for almost any environment including heat treat facilities, tool rooms, workshops, laboratories and inspection labs. So test away with confidence and a level of accuracy you will only find at Phase II.

24 Superficial Rockwell Hardness Tester with Digital Indicator



Included Accessories:

- N-scale Diamond Indentor
- 1/16" Steel Ball Indentor
- 3- HRN Test Blocks
- 3-HRT Test Blocks
- Test Table 5.87" (150mm)
- Flat Anvil 2.5" (63mm)
- Spot Anvil .38" (10mm)
- Std. Vee Anvil
- Accessory Case
- Dust Cover

Test Force Control	Hydraulic Dash Pot
Results Display	Digital Dial
Vertical Capacity	6.7 in.
Throat Depth	6.6 in.
Height	28 in.
Width	8.9 in.
Depth	19.6 in.
Shipping Weight	190 lbs

Options:

- NIST/ASTM certified test blocks, penetrators and kits are available. Please refer to pages 48-52.

**PLEASE CONTACT US
FOR DETAILS.**

Specifications:

Minor Load	3 Kgf
Major Load	15 Kgf, 30 Kgf, 45 Kgf
Test Force Application	Dead Weight

900-345D

Just like our Phase II analog rockwell hardness tester, the the Phase II superficial rockwell hardness tester with digital indicator comprises the very best in "state of the art" design, coupled with dynamic precision only found at Phase II. Used for testing thin and soft metals in the superficial rockwell hardness scales, this tester is easy to operate yet engineered to obtain highly sensitive and accurate readings. The 900-345D will offer unmatched repeatability in all superficial rockwell scales. A perfect, rugged performer suited for almost any environment including heat treat facilities, tool rooms, workshops, laboratories and inspection labs. So test away with confidence and a level of accuracy you will only find at Phase II.

Rockwell & Superficial Rockwell Scale Hardness Tester

25



Minor Load	3Kgf	10Kgf
Major Load	15Kgf	60 Kgf
	30 Kgf	100 Kgf
	45 Kgf	150 Kgf
Test Force Application	Dead Weight	
Test Force Control	Manual	
Results Display	Dual Scale Dial	
Vertical Capacity	6.0 in.	
Throat Depth	5.5 in.	
Height	26 in.	
Width	18.2 in.	
Depth	9.4 in.	
Weight	165 lbs.	

Included Accessories:

- Diamond Conical Indentor
- 1/16" Ball Indentor
- 2- HRC Test Blocks
- 1- HRB Test Block
- 1- HR15N Test Block
- 1- HR30N Test Block
- 1- HR45T Test Block
- Test Table 5.87" (150mm)
- Flat Anvil 2.5" (63mm)
- Std. Vee Anvil
- Accessory Case
- Dust Cover

Options:

- NIST/ASTM certified test blocks, penetrators and kits are available. Please refer to pages 48-52.

**PLEASE CONTACT US
FOR DETAILS.**

Features:

- Direct analog dial reading
- Advanced design, easy to operate
- Engineered to obtain highly sensitive and accurate readings
- Conforms to ASTM E-18 - Perfect for laboratories, workshops, tool rooms, inspection labs, etc.

Test Rockwell and Superficial Rockwell Hardness in 1 Unit!

900-375

Our latest Phase II analog Rockwell Hardness Tester, the 900-375, tests both Rockwell hardness and Superficial Rockwell hardness in one unit, with state of the art design and dynamic precision only found at Phase II. The Phase II Twin Rockwell/Superficial Rockwell hardness tester is ruggedly engineered to obtain highly sensitive and accurate readings. Conforming to ASTM E-18 Rockwell hardness standards, this hardness tester will offer unmatched repeatability in all Rockwell hardness scales. A perfect performer suited for any environment including heat treatment facilities, tool rooms, workshops, laboratories and inspection labs. Lifetime technical support is included with all Phase II Hardness Testers. So test away with confidence and a level of accuracy you will only find at Phase II.

26 Digital Superficial Rockwell Hardness Tester

Touch Screen Functions w/One Touch Testing Feature!

Direct Loading Method With Load-Cell Instead Of Dead Weight System. High Speed Test Cycle and Extremely Accurate Loading Control

- Automatic conversions to HB, HV, Regular Rockwell Scales
- Touch Screen selectable system
- Upper/Lower Limit Settings

Minor Load	3 Kgf
Major Load	15 Kgf, 30 Kgf, 45 KGF
Test Force Application	Load Cell Closed Loop
Test Force Control	Motorized
Results Display	Hi Def LCD Digital Readout
Resolution	0.01HR
Vertical Capacity	7.80"
Throat Depth	5.90"
Height	700mm
Width	600mm
Depth	250mm
Weight	220 lbs

Accessories Included:

- N-scale Diamond Indenter
- 1/16" Ball Indenter
- 2- HRN test Blocks
- 3- HRT Test Block
- Test Table 5.87" (150mm)
- Flat Anvil 2.5" (63mm)
- Std. V- Anvil
- Dust Cover
- Accessory Case

Options:

NIST/ASTM certified test blocks, penetrators and kits are available. Please refer to pages 48-52.

PLEASE CONTACT US FOR DETAILS.

- **Test resolution: 0.01HR Rockwell unit;**
- **Operation temperature: 50° - 95°F (10° ~ 35°C)**
- **Power supply: single phase, AC, 110-220 with manual change, 50~60Hz, 4A;**
- **Machine dimension: 700mm*250mm*600mm.**



Load Cell, Closed Loop, Superficial Rockwell Hardness Tester!

900-346

Just like our Phase II analog rockwell hardness tester, the the Phase II superficial rockwell hardness tester with digital indicator comprises the very best in "state of the art" design, coupled with dynamic precision only found at Phase II. Used for testing thin and soft metals in the superficial rockwell hardness scales, this tester is easy to operate yet engineered to obtain highly sensitive and accurate readings. The 900-345D will offer unmatched repeatability in all superficial rockwell scales. A perfect, rugged performer suited for almost any environment including heat treat facilities, tool rooms, workshops, laboratories and inspection labs. So test away with confidence and a level of accuracy you will only find at Phase II.

Digital Rockwell Hardness Tester

27



Touch Screen Functions w/One Touch Testing Feature!

Direct Loading Method With Load-Cell Instead Of Dead Weight System. High Speed Test Cycle and Extremely Accurate Loading Control

- Automatic conversions to HB, HV, Regular Rockwell Scales
- Touch Screen selectable system
- Upper/Lower Limit Settings

Minor Load	10 Kgf
Major Load	60 Kgf, 100 Kgf, 150 KGF
Test Force Application	Load Cell Closed Loop
Test Force Control	Motorized
Results Display	Hi Def LCD Digital Readout
Resolution	0.01HR
Vertical Capacity	7.80"
Throat Depth	5.90"
Height	700mm
Width	600mm
Depth	250
Weight	220 lbs

- Test resolution: 0.01HR Rockwell unit;
- Operation temperature: 50° - 95°F (10°C~35°C)
- Ambient environment: clean, no vibration, no strong magnetic field, and no corrosive medium
- Power supply: single phase, AC, 110-220 with manual change, 50~60Hz, 4A;
- Machine dimension: 700mm×250mm×600mm.

Options:
NIST/ASTM certified test blocks, penetrators and kits are available. Please refer to pages 48-52.
PLEASE CONTACT US FOR DETAILS.

- Accessories Included:**
- C-scale Diamond Indenter
 - 1/16" Ball Indenter
 - 3- HRC test Blocks
 - 1- HRB Test Block
 - 1-HRA Test Block
 - Test Table 5.87" (150mm)
 - Flat Anvil 2.5" (63mm)
 - Std. V- Anvil
 - Dust Cover
 - Accessory Case

Load Cell, Closed Loop, Superficial Rockwell Hardness Tester!

900-367

This digital Rockwell hardness tester with fully automated load/unload procedures affords highly sensitive and accurate readings. Micro computer controlled Touch Screen with USB output to PC. The 900-367 digital Rockwell hardness tester offers programmable scale conversions, dwell times, statistical capabilities and test counter. Capable of testing in all of the regular Rockwell hardness scales.

28 Digital Rockwell Hardness Tester



2 Key performance parameters

- Preload: 98.1N (10kgf)
- Total test force: 588.4N(60kgf), 980.7N(100kgf), 1471N(150kgf)
- Scales: HRA,HRB, HRC, HRD, HRE, HRF, HRG, HRH, HRK, HRE, HRL, HRM, HRP, HRR, HRS, HRV
- Load dwell duration: 2-50s
- Resolutio: 0.1HR
- Display: High definition backlight LCD
- Operation: Menu selectable push buttons
- Auxiliary functions: Upper/lower limits setting& alarm, Scale conversions: HV & HB
- Data output: USB memory stick
- Testing Capacity: Vertical: 8.00" Throat Depth: 7.87"
- Dimensions: Height: 22.04" Width: 8.07" Depth: 31.49" (560mm×205mm×800mm)
- Power supply: single phase, AC, 110V, 50-60Hz, 4A
- Gross weight: 175lbs (80kg)

Accessories Included:

- A. Large Anvil
- B. Small Diameter Anvil
- C. V-shaped Anvil
- D. Five Test Blocks
- 1. One each, HRA 70-85
- 2. One each, HRB 75-95
- 3. One each, HRC 25-35
- 4. One each, HRC 40-50
- 5. One each, HRC 55-65
- E. 120Ø Diamond Indentor
- F. 1/16" Carbide Ball indentor
- G. Storage BoxT

Options:

NIST/ASTM certified test blocks, penetrators and kits are available.

Please refer to pages 48-52.

**PLEASE CONTACT US
FOR DETAILS.**

900-410

If analog rockwell hardness tester, the the Phase II superficial rockwell hardness tester with digital indicator comprises the very best in "state of the art" design, coupled with dynamic precision only found at Phase II. Used for testing thin and soft metals in the superficial rockwell hardness scales, this tester is easy to operate yet engineered to obtain highly sensitive and accurate readings. The 900-345D will offer unmatched repeatability in all superficial rockwell scales. A perfect, rugged performer suited for almost any environment including heat treat facilities, tool rooms, workshops, laboratories and inspection labs. So test away with confidence and a level of accuracy you will only find at Phase II.



**Cast Iron Body!
w/Touch Screen Functions**

Minor Load	10 Kgf
Major Load	60 Kgf, 100 Kgf, 150 KGF
Test Force Application	Load Cell Closed Loop
Test Force Control	Motorized
Results Display	Hi Def LCD Digital Readout
Resolution	0.01HR
Vertical Capacity	8.0"
Throat Depth	7.8"
Height	22"
Width	8"
Depth	31"
Weight	175 lbs

Options:
NIST/ASTM certified test blocks, penetrators and kits are available.
Please refer to pages 48-52.
PLEASE CONTACT US FOR DETAILS.

Accessories Included:
C-scale Diamond Indenter
1/16" Ball Indenter
3- HRC test Blocks
1- HRB Test Block
1-HRA Test Block
Test Table 5.87" (150mm)
Flat Anvil 2.5" (63mm)
Std. V- Anvil
Dust Cover
Accessory Case

- Test resolution: 0.01HR Rockwell unit;
- Operation temperature: 50° - 95°F (10°C~35°C)
- Ambient environment: clean, no vibration, no strong magnetic field, and no corrosive medium
- Power supply: single phase, AC, 110-220 with manual change, 50~60Hz, 4A;

- Direct Loading Method With Load-Cell Instead Of Dead Weight System. High Speed Test Cycle and Extremely Accurate Loading Control**
- Automatic conversions to HB, HV, Regular Rockwell Scales
 - Touch Screen selectable system
 - Upper/Lower Limit Settings

Load Cell, Closed Loop, Superficial Rockwell Hardness Tester!

900-415

This digital Rockwell hardness tester with fully automated load/unload procedures affords highly sensitive and accurate readings. Micro computer controlled Touch Screen with USB output to flash drive. The 900-415 digital Rockwell hardness tester offers programmable scale conversions, dwell times, statistical capabilities and test counter. Capable of testing in all of the regular Rockwell hardness scales.

30 Tall Frame Digital Superficial Rockwell Hardness Tester



Features:

- Fully automated load/unload procedures affords highly sensitive and accurate readings
- Micro computer controlled with USB output to built-in mini printer or PC.
- Offers programmable scale conversions, dwell times, statistical capabilities and test counter
- Capable of testing in all of the Superficial Rockwell® scales
- Automatic conversions to HRC, HRB, HB, HV, HLD and Ob
- Easily obtain Average, Min/Max, S, R
- Menu selectable system
- Upper/Lower Limit Settings
- Memory of 500 test results
- Curved Surface Auto correction



Minor Load	3Kgf
Major Load	15Kgf 30 Kgf 45 Kgf
Test Force Application	Dead Weight
Test Force Control	Motorized
Results Display	Hi Def LCD Digital
Vertical Capacity	16.5"
Throat Depth	6.50"
Height	28.34"
Width	7.87"
Depth	21.60"
Weight	330 lbs

Options:

- NIST/ASTM certified test blocks, penetrators and kits are available. Please refer to pages 48-52.

PLEASE CONTACT US FOR DETAILS.

Included Accessories:

- N-scale Diamond Indentor
- 1/16" Steel Ball Indentor
- 3- HRN Test Blocks
- 3-HRT Test Blocks
- Test Table 5.87" (150mm)
- Flat Anvil 2.5" (63mm)
- Std. Vee Anvil
- Accessory Case
- Dust Cover

FOR TESTING VERY LARGE PARTS

900-349 Special Order Only

Fully automated load/unload procedures affords highly sensitive and accurate readings. Micro computer controlled with USB output to built-in mini printer. Offers programmable scale conversions, dwell times, statistical capabilities and test counter.

Tall Frame Digital Motorized Rockwell 31 Hardness Tester

Features:

- Easily obtain Average, Min/Max, S, R
- Menu selectable system
- Upper/Lower Limit Settings
- Memory of 500 test results
- Curved Surface Auto Correction

Included Accessories:

- C-scale Diamond Indenter
- 1/16" Ball Indenter
- 3- HRC test Blocks
- 2- HRB Test Blocks
- 1PC HRA Test Block
- Built-in Mini Printer
- Test Table 5.87" (150mm)
- Flat Anvil 2.5" (63mm)
- Std. Vee Anvil
- Accessory Case
- Dust Cover

Minor Load	10 Kgf
Major Load	60 kgf, 100 kgf, 150 kgf
Test Force Application	Dead Weight
Test Force Control	Motorized
Results Display	Hi Def LCD Digital Readout
Resolution	0.1HR
Memory/Output	500 Tests/USB
Vertical Capacity	16.5"
Throat Depth	6.50"
Height	28.34"
Width	7.87"
Depth	21.60"
Weight	330 lbs



Options:

- NIST/ASTM certified test blocks, penetrators and kits are available. Please refer to pages 48-52.

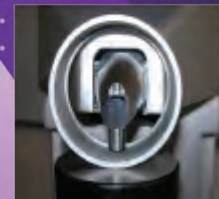
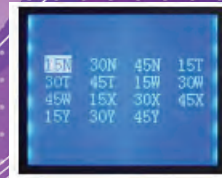
**PLEASE CONTACT US
FOR DETAILS.**

Comes Complete with everything needed to test in the following Rockwell Scales; A, B, C, D, F, G. Rockwell Scales E, H, K, L, M, P, R, S, V can be achieved with optional indentors!

900-366

This digital Rockwell hardness tester with fully automated load/unload procedures affords highly sensitive and accurate readings. Micro computer controlled with USB output to built-in mini printer. The 900-366 digital Rockwell hardness tester offers programmable scale conversions, dwell times, statistical capabilities and test counter. Capable of testing in all of the regular Rockwell® scales.

Tall Frame TWIN Rockwell Hardness Tester



Options:

- NIST/ASTM certified test blocks, penetrators and kits are available. Please refer to pages 48-52.

PLEASE CONTACT US FOR DETAILS.

Features:

16.9" Vertical Capacity

- The protruding indenter design is ideal for testing inside diameters and recesses, often impossible with more traditional hardness testers. Inside diameters as small as 1-1/2-inches can be tested with the standard indenter. Operators can test close to vertical surfaces, to within 1/4-inch with the standard indenter. Testing is fast, accurate and there are fewer broken diamonds due to an outstanding viewing area.
- Wide measurement range: 30 rockwell hardness scales in total, HRA, HRB, HRC, HRD, HRE, HRF, HRG, HRH, HRK, HRL, HRM, HRP, HRR, HRS, HRV, HR15N, HR30N, HR45N, HR15T, HR30T, HR45T, HR15W, HR30W, HR45W, HR15X, HR30X, HR45X, HR15Y, HR30Y and HR45Y.
- Auxiliary functions: The 900-386 rockwell hardness tester is capable of upper and lower limit settings; data statistics, the computing for average value, standard deviation, maximum and minimum; scale conversion (the testing results can be converted into the values of HB, HV, HLD, HK and b (strength); curved surface correction will automatically correct the measuring results for cylindrical surface and spherical surface.

Minor Load	3Kgf	10Kgf
Major Load	15Kgf	60 Kgf
	30 Kgf	100 Kgf
	45 Kgf	150 Kgf
Test Force Application	Dead Weight	
Test Force Control	Motorized	
Display	Hi-Def. Digital Readout	
Display Resolution	0.1HR	
Vertical Capacity	16.9 in.	
Throat Depth	7.8 in.	
Power Supply	single phase, AC, 110V/220V (selectable)	
Weight	285lbs Net (Shipping weight= 350 lbs.)	
Dimensions	730mm x 400mm x1000mm	

900-386

The NEW! Phase II Tall Frame 900-386 twin hardness tester can be used directly to measure Rockwell and superficial Rockwell hardness and change those values of Rockwell hardness into HB, HV, HLD, HK and Db values.

Loaded with features, the 900-386 rockwell hardness tester is capable of upper and lower limit settings; data statistics, the computing for average value, standard deviation, maximum and minimum; scale conversion (the testing results can be converted into the values of HB, HV, HLD, HK and Db (strength) and curved surface correction. A perfect performer suited for any environment including heat treat facilities, tool rooms, workshops, laboratories and inspection labs.

Digital Rockwell/Superficial Rockwell Hardness Tester 33



**Load Cell, Closed Loop,
Rockwell Hardness Tester!**

**Touch Screen Functions w/One
Touch Testing Feature!**

Minor Load	29.4N (3kgf), 98.1N (10kgf)
Major Load	147.1N(15kgf), 294.3N(30kgf), 441.3N(45kgf), 588.4N (60kgf), 980.7N (100kgf), 1471N (150kgf)
Test Force Application	Load Cell Closed Loop
Test Force Control	Motorized
Results Display	Hi Def LCD Digital Readout
Resolution	0.01HR
Vertical Capacity	7.80"
Throat Depth	5.90"
Height	700mm
Width	600mm
Depth	250
Weight	220 lbs
Weight	220 lbs

Options:

- NIST/ASTM certified test blocks, penetrators and kits are available. Please refer to pages 48-52.

**PLEASE CONTACT US
FOR DETAILS.**

- Test resolution: 0.01HR Rockwell unit;
- Operation temperature: 50°-95°F (10DCØ35DC)
- Ambient environment: clean, no vibration, no strong magnetic field, and no corrosive medium;
- Power supply: single phase, AC, 110-220 with manual change, 50~60Hz, 4A;
- Machine dimension: 700mm×250mm×600mm.

**Direct Loading Method With Load-Cell Instead Of Dead Weight System.
High Speed Test Cycle and Extremely Accurate Loading Control**

**Ascent of Load Shaft • Minor Load Application • Test Load Application/Hold/Release
Rockwell Hardness Display • Descent of Load Shaft**

- Automatic conversions to HB, HV, Other Rockwell Scales
- Touch Screen selectable system
- Upper/Lower Limit Settings

Accessories Included:

- C-scale Diamond Indenter
- 1/16" Ball Indenter
- 2- HRC test Blocks
- 1- HRB Test Block
- 1-HRN Test Block
- Test Table 5.87" (150mm)
- Flat Anvil 2.5" (63mm)
- Std. V- Anvil
- Dust Cover
- Accessory Case

900-387

This digital Rockwell/Superficial Rockwell hardness tester with fully automated

load/unload procedures affords highly sensitive and accurate readings. Micro computer controlled Touch Screen with USB output to PC. The 900-387 digital Rockwell hardness tester offers programmable scale conversions, dwell times, statistical capabilities and test counter. Capable of testing in all of the regular Rockwell hardness scales

34

Fully Automatic Rockwell Hardness Tester

Auto Z Axis Load Cell!

Features:

- The test force is applied via a closed-loop control unit with a load cell, a DC motor and an electronic measurement and control unit replace traditional dead weights. The result is highly accurate measurements at all test loads up to 0.5%.
- Simple plug - and - play tech allows for much more quick and easy installation than traditional dead weight type machines.
- Automated Z-Axis. Just press START key once, entire test process will be finished automatically. regardless of the size of the sample, the position of the sample, the distance between the indenter and sample surface. The sample will be auto-lifted to approach the indenter and finish testing automatically.
- Higher precision than handle wheel lifting/dead weight type machines which can be affected by user interaction.
- Extended dolphin nose allows vertical test height of 11.8" and throat depth of 8.6".
- Built-in micro-printer.

Basic Functions:

- Twin tester—Regular Rockwell & Superficial Rockwell hardness for metal and plastic material.
- Horizontal dolphin nose Indenter is suitable also for internal and external testing.
- Testing on Surfaces difficult to reach. Testing internal surface of rings and tubes.
- Provided with many features such as high measuring precision, wide measuring range with 30 Rockwell scales.
- The tester is suitable for testing of carbon steel, alloy steel, cast iron, non-ferrous metal.
- Automatic testing cycle: Lifting of part, pre-loading, loading, dwell, unloading, results will be finished automatically.
- Measuring results digitally displayed and can be printed, or transmitted to external computer automatically via USB port.
- Test HR value can be converted to the value of HB, HV, HK and ob value.
- The tester meets the following standards: ISO 6508-2, ASTM E18

Options:

- NIST/ASTM certified test blocks, penetrators and kits are available. Please refer to pages 48-52.

**PLEASE CONTACT US
FOR DETAILS.**

Included Accessories:

- Standard hardness block for A scale
- Standard hardness block for B scale
- Standard hardness block for C scale (3)
- Standard hardness block for 30N scale
- Standard hardness block for 30T scale
- Ball indenter (1/16")
- 120° cone diamond indenter
- Mounting screws for indenter (2)
- Flat anvil
- "V" shape anvil
- Power supply cord
- Screwdriver for indenter mounting
- Dust cover

Parameters:

- Preload: 29.4N (3kgf), 98.1N (10kgf)
- Total test force: 147.1N (15kgf), 294.3N (30kgf), 441.3N (45kgf), 588.4N (60kgf), 980.7N (100kgf), 1471N (150kgf)
- Scales: HR15N, HR30N, HR45N, HR15T, HR30T, HR45T, HR15W, HR30W, HR45W, HR15X, HR30X, HR45X, HR15Y, HR30Y, HR45Y, HRA, HRB, HRC, HRD, HRE, HRF, HRG, HRH, HRK, HRL, HRM, HRP, HRR, HRS, HRV
- Load dwell duration: 2-50s, can be set and stored
- Resolution: 0.1HR
- Display: High definition backlight LCD
- Operation: Menu selectable, Membrane keypad
- Upper/lower limits setting & alarming
- Data statistics: Avg., Max., Min., S, R
- Curved surface auto correction
- Memory: Max 400 items of test results stored automatically
- Testing Capacity: 300mm (vertical), 220mm (horizontal)
- Dimensions: 690mm x 280mm x 860mm
- Power supply: AC, 220V/110V, 50/60Hz, 4A (convertible)
- Net weight: 86 kg (190lbs)
- Gross weight: 120kg (265 lbs)



900-388

Fully Automatic Universal Hardness Tester 35

**READS DIRECTLY IN ROCKWELL,
SUPERFICIAL ROCKWELL, BRINELL
AND VICKERS SCALES!**



Features:

- Universal Hardness Tester designed for metal and plastic materials
- Horizontal dolphin nose Indenter is suitable also for internal and external testing.
- Testing on Surfaces difficult to reach. Testing internal surface of rings and tubes.
- Provided with many features such as high measuring precision, wide measuring range with 30 Rockwell scales.
- The tester is suitable for testing of carbon steel, alloy steel, cast iron, non ferrous metal.
- Automatic testing cycle: Lifting of part, pre-loading, loading, dwell, unloading, results will be finished automatically.
- Measuring results digitally displayed and can be printed, or transmitted to external computer automatically via USB port.
- Test HR value can be converted to the value of HB, HV, HK and ob value.

BRINELL parameters

Test Force	15.625kgf, 31.25kgf, 62.5kgf, 100kgf, 125kgf, 187.5kgf, 250kgf
Indenter	2.5mm, 5mm, 10mm
Scales	2.5/187.5, 2.5/62.5, 2.5/31.25, 2.5/15.625, 5/250, 5/125, 5/62.5, 10/100, 10/250

VICKERS parameters

Test Force	3kgf, 10kgf, 20kgf, 30kgf, 50kgf, 100kgf
Indenter	136° diamond pyramid
Scales	HV3, HV10, HV20, HV30, HV50, HV100

Other Parameters:

- Load dwell duration: 2~50s, can be set and stored
- Resolution: 0.1HR
- Display: High definition backlight LCD
- Operation: Menu selectable, Membrane keypad
- Limit setting: Upper/lower limits setting & alarming
- Data statistics: Avg., Max., Min., S, R
- Curved surface auto correction
- Memory: Max 400 items of test results stored automatically
- Testing Capacity: 300mm (vertical) , 220mm (horizontal)
- Dimensions: 690mm×280mm×860mm
- Power supply: AC, 220V/110V, 50/60Hz, 4A (convertible)
- Net weight: 86 kg (190lbs)
- Gross weight: 120kg (265 lbs)

900-450

The test force is applied via a closed-loop control unit with a load cell, a DC motor and an electronic measurement and control unit that replace traditional dead weights. The result is highly accurate measurements at all test loads up to 0.5%. Simple plug and-play tech allows for much more quick and easy installation than traditional dead weight type machines. Automated Z-Axis. Just press START key once, entire test process will be finished automatically, regardless of the size of the sample, the position of the sample, the distance between the indenter and sample surface. The sample will be auto-lifted to approach the indenter and finish testing automatically. Higher precision than handle wheel lifting/dead weight type machines which can be affected by user interaction. Extended dolphin nose allows vertical test height of 11.8" and throat depth of 8.6". Built-in micro-printer.

36 Digital Brinell Hardness Tester with Closed Loop, Load Cell Technology

Features:

- Load Cell driven system provides precise control of test force application
- Direct reading
- Engineered to obtain highly sensitive and accurate readings
- Perfect for laboratories, workshops, tool rooms, inspection labs, etc.
- Measuring Range: 8-650HBW

Included Accessories:

- Calibration block 125-350HBW10/3000
- Calibration block 125-350HBW10/1000
- 10mm Tungsten Carbide Ball indenter
- 5mm Tungsten Carbide Ball indenter
- 2.5mm Tungsten Carbide Ball indenter
- Mounting screws for indenter
- Flat anvil
- "V" shape anvil
- 20X microscope
- Dust cover

Hardness Range(HBW)	Error (%)	Repeatability(%)
≤ 125	± 3.0	≤ 3.0
125 < HBW ≤ 225	± 2.5	≤ 2.5
> 225	± 2.0	≤ 2.0

Specifications:

Loads:	F3000kgf (29400N), 1500Kgf (14700N), 1000Kgf (9800N), 750Kgf(7355N),500Kgf (4900N), 250Kgf (2452N), 187.5Kgf (1839N), 125Kgf (1226N),100Kgf (980N), 62.5Kgf(612.9N)
Load dwell duration:	2s-99s, can be set and stored
Tungsten Carbide Ball indenter:	10mm, 5mm, 2.5mm
Measuring range:	8HBW-650HBW
Magnification of the microscope:	20X
Resolution capability of the microscope:	0.005mm
Max measurable height:	230 mm
Max measurable depth:	140 mm
Dimensions:	530mm x 260mm x 750mm
Power supply:	220/110 V, 50/60 Hz, 4A
Weight:	224lbs.



Optional Accessory:
PHT-5000 Optical Brinell Scanner.
See Page 41

Options:

- NIST/ASTM certified test blocks, penetrators and kits are available. Please refer to pages 50-52.

PLEASE CONTACT US FOR DETAILS.

900-355

Innovative closed-loop technology. The tester incorporates the latest load cell technology. The test load is applied via a closed-loop control unit with a load cell, a DC motor and an electronic measurement and control unit. The result is highly accurate Brinell hardness measurements at all test loads up to 0.5%. The common load overshoot or undershoot as known from traditional dead weight, or open-loop, systems is eliminated. The absence of mechanical weights not only eliminates friction problems but also makes the equipment less sensitive to misalignments caused by vibrations.

Tall Frame Digital Brinell Hardness Tester with Closed Loop, Load Cell Technology



Optional Accessory:
PHT-5000 Optical Brinell Scanner
See Page 41



- Features:**
- 15.7" Vertical Capacity**
- Test load selection by keypad and shown on the LCD screen
 - Fully automatic test cycles. The Brinell hardness Tester features a fully automatic test cycle, load application, dwell, unloading, is performed fully automatically. This greatly improves reproducibility of test results since operator influence is eliminated.
 - Selectable dwell times by screen. The indenter, load, and other test information are shown clearly on the large LCD screen.
 - The directions for 0.102F/D2 ratios selecting according to the materials and hardness range can be shown on the screen.
 - Equipped with a 20X optical microscope to measure the diameter of Brinell indentation.
 - Brinell Hardness Calculator(BHC) makes the hardness value calculation easy and convenient.

- Options:**
- NIST/ASTM certified test blocks, penetrators and kits are available. Please refer to pages 50-52.
- PLEASE CONTACT US FOR DETAILS.**

- Included Accessories:**
- Calibration block 125-350HBW10/3000
 - Calibration block 125-350HBW10/1000
 - 10mm Tungsten Carbide Ball indenter
 - 5mm Tungsten Carbide Ball indenter
 - 2.5mm Tungsten Carbide Ball indenter
 - Mounting screws for indenter
 - Flat anvil
 - "V" shape anvil
 - 20X microscope
 - Dust cover

Technical Specifications:

Loads: 3000kgf (29400N), 1500kgf (14700N), 1000kgf (9800N), 750kgf(7355N),500kgf (4900N), 250kgf (2452N), 187.5kgf (1839N), 125kgf (1226N),100kgf (980N), 62.5kgf(612.9N)

Load dwell duration: 2s~99s, can be set and stored

Tungsten Carbide Ball Indenter: 10mm, 5mm, 2.5mm

Measuring Range: 3.18HBW~658HBW

Magnification of the Microscope: 20X

Resolution capability of the Microscope: 0.005mm

Accuracy of Brinell Hardness Value:

Hardness Range(HBW)	Error (%)	Repeatability(%)
≤ 125	± 3.0	≤ 3.0
125 < HBW ≤ 225	± 2.5	≤ 2.5
> 225	± 2.0	≤ 2.0

Max measurable height: 430 mm (w/large anvil) **450mm (w/small anvil)**

Max measurable depth: 200mm

Dimensions: 600mm×300mm×1000mm

Power supply: 220/110 V, 50/60 Hz, 4A (Convertible)

Weight: 205kg (gross) 165kg(net)

900-356

Innovative closed-loop technology. The tester incorporates the latest load cell technology. The test load is applied via a closed-loop control unit with a load cell, a DC motor and an electronic measurement and control unit. The result is highly accurate Brinell hardness measurements at all test loads up to 0.5%. The common load overshoot or undershoot as known from traditional dead weight, or open-loop, systems is eliminated. The absence of mechanical weights not only eliminates friction problems but also makes the equipment less sensitive to misalignments caused by vibrations.

Touch Screen! Digital Brinell Hardness Tester



3-Indentors
2.5mm, 5mm, 10mm
2-Objectives
20x, 40x
Covers all loads from
62.5kgf up to 3000kgf

Features:

- Load Cell driven system provides precise control of test force application
- Direct Touch Screen Controls
- 3 Indentors and 2 Objectives covering all common Brinell scales
- Engineered to obtain highly sensitive and accurate readings
- Perfect for laboratories, workshops, tool rooms, inspection labs, etc.
- Measuring Range: 8-650HBW

Auto Z-Axis!

Auto Load/Unload!

Touch Screen Monitor! • Instant Brinell Readings!
No Manual Scope Needed! • No Conversion Charts Needed!

Technical Data:

-Test force is selectable

612.9N(62.5kgf)	4903N(500kgf)
980.7N(100kgf)	7355N(750kgf)
1226N(125kgf)	9807N(1000kgf)
1839N(187.5kgf)	14710N(1500kgf)
2452N(250kgf)	29420N(3000kgf)

Test Range

3.18 ~ 653HBW

Loading Method

Automatic (Loading/Dwell/Unloading)

Hardness Reading

Indentation Displaying and Automatic Measuring on Touch Screen

Computer

- CPU: Intel I3
- Memory: 2G
- SSD: 32G

Conversion Scale

HV, HK, HRA, HRB, HRC, HRD, HRE, HRF, HRG, HRK, HR15N, HR30N, HR45N, HR15T, HR30T, HR45T, HS, HBS, HBW

Data Output

USB Port, VGA Interface, Network Interface

Turret Control

Automatic Recognition and Shifting
(Three Indentors, Two Objectives)

Objective

1x, 2x

Total Magnification

20x, 40x

Resolution

1.25 μ m - 0.625 μ m

Dwell Time

0 ~ 95s

Max. Height of Specimen

260mm

Throat

150mm

Power Supply

AC220V, 50Hz

Standard

ISO 6506, ASTM E10-12, JIS Z2243, GB/T 231.2

Dimension

600x330x890mm, Packing Dimension: 820x460x1170mm

Weight

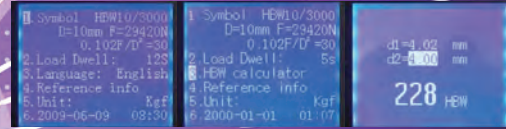
Net Weight: 150kg, Gross Weight: 180kg

900-357 Special Order Only

Innovative closed-loop technology. The Brinell hardness tester incorporates the latest load cell technology. The test load is applied via a closed-loop control unit with a load cell, a DC motor and an electronic measurement and control unit. The result is highly accurate Brinell hardness tester measurements at all test loads up to 0.5%. The common load overshoot or undershoot as known from traditional dead weight, or open-loop, systems is eliminated. The absence of mechanical weights not only eliminates friction problems but also makes the equipment less sensitive to misalignments caused by vibrations.

The 900-357 Brinell hardness tester combines a touch screen computer and Brinell hardness tester in one complete Brinell hardness testing package. All the required parameters can be selected on the panel computer. Its clear display and touch screen make it easy to use and eliminates user error. The clear video screen using its CCD interface will directly display the dynamic indentation image, lock the image and automatically measure the Brinell hardness. The operator can choose the selectable conversion values among the hardness scales, save the results of each measurement and generate the image report. The load of test forces is accomplished using state of the art load cell system combined with precision mechanical drive.

Digital Motorized Brinell Hardness Tester 39 w/Auto Z Axis!



Technical Specifications:		
Loads: 3000kgf (29400N), 1500Kgf (14700N), 1000Kgf (9800N), 750Kgf(7355N),500Kgf (4900N), 250Kgf (2452N), 187.5Kgf (1839N), 125Kgf (1226N),100Kgf (980N), 62.5Kgf(612.9N)		
Load dwell duration: 2s~99s, can be set and stored		
Tungsten Carbide Ball Indenter: : 10mm, 5mm, 2.5mm		
Measuring Range: 3.18HBW~58HBW		
Magnification of the Microscope: 20X		
Resolution capability of the Microscope: 0.005mm		
Accuracy of Brinell Hardness Value:		
Hardness Range(HBW)	Error (%)	Repeatability(%)
≤ 125	± 3.0	≤ 3.0
125 < HBW ≤ 225	± 2.5	≤ 2.5
> 225	± 2.0	≤ 2.0
Max measurable height: 230 mm		
Max measurable depth: 140 mm		
Dimensions: 530mm×260mm×1000mm		
Power supply: 220/110 V, 50/60 Hz, 4A		
Weight: 110kg		

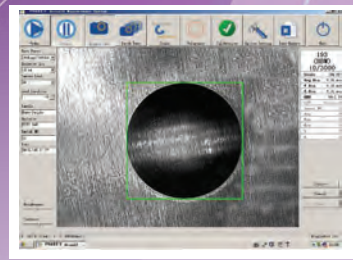
900-358

Innovative closed-loop technology. The tester incorporates the latest load cell technology. The test load is applied via a closed-loop control unit with a load cell, a DC motor and an electronic measurement and control unit. The result is highly accurate Brinell hardness measurements at all test loads up to 0.5%. The common load overshoot or undershoot as known from traditional dead weight, or open-loop, systems is eliminated. The absence of mechanical weights not only eliminates friction problems but also makes the equipment less sensitive to misalignments caused by vibrations.

40 Automatic Brinell Hardness Tester w/Auto Z Axis!



- Features:**
- Fully automated test cycles. Press the START key once, the hardness tester will complete the entire test cycle automatically—1) sample elevation 2) major load application 3) Dwell Time 4) Unloading.
 - Equipped with CCD camera and built-in touch screen PC performs the indentation measuring process automatically.
 - Measurement software includes useful functions.
 - a) Single and batch testing mode
 - b) Tolerance setting w/ alarm
 - c) Statistic values such as Max, Min, Avg, R and S are selectable
 - d) Convert test result to other scales, such as HRC, HRB, HRA, HV, Db.
 - All test results and indentation images are saved automatically
 - Test report created in Microsoft EXCEL format, can be edited, copied or printed.
 - Load Cell driven system provides precise control of test force application
 - Direct digital reading
 - Engineered to obtain highly sensitive and accurate readings
 - Perfect for laboratories, workshops, tool rooms, inspection labs, etc.
 - Measuring Range: 8-650HBW



Technical Specifications:

Loads: 3000kgf (29400N), 1500Kgf (14700N), 1000Kgf (9800N), 750Kgf(7355N), 500Kgf (4900N), 250Kgf (2452N), 187.5Kgf (1839N), 125Kgf (1226N), 100Kgf (980N), 62.5Kgf(612.9N)

Load dwell duration: 2s~99s, can be set and stored

Tungsten Carbide Ball Indenter: : 10mm, 5mm, 2.5mm

Measuring Range: 3.18HBW~58HBW

Accuracy of Brinell Hardness Value:

Hardness Range(HBW)	Error (%)	Repeatability(%)
≤ 125	± 3.0	≤ 3.0
125 < HBW ≤ 225	± 2.5	≤ 2.5
> 225	± 2.0	≤ 2.0

Max measurable height: 230 mm

Max measurable depth: 140 mm

Dimensions: 530mm×260mm×1000mm

Power supply: 220/110 V, 50/60 Hz, 4A

Weight: 110kg

900-359

Innovative closed-loop technology. The tester incorporates the latest load cell technology. The test load is applied via a closed-loop control unit with a load cell, a DC motor and an electronic measurement and control unit. The result is highly accurate Brinell hardness measurements at all test loads up to 0.5%. The common load overshoot or undershoot as known from traditional dead weight, or open-loop, systems is eliminated. The absence of mechanical weights not only eliminates friction problems but also makes the equipment less sensitive to misalignments caused by vibrations.

Optical Brinell Reader 41



- Increase Accuracy!
- Eliminate user measurement errors!
- Fast and easy measurements!

Laptop Not Included

Features:

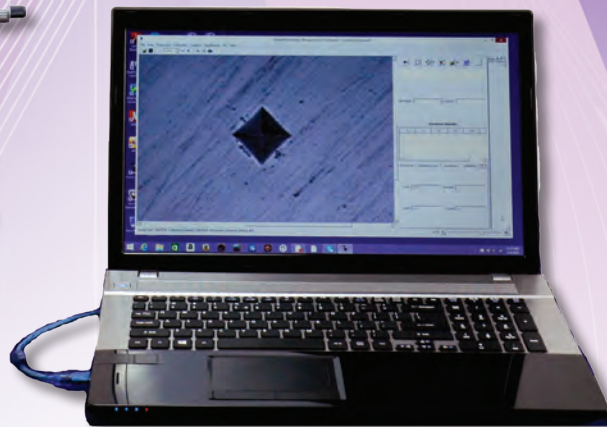
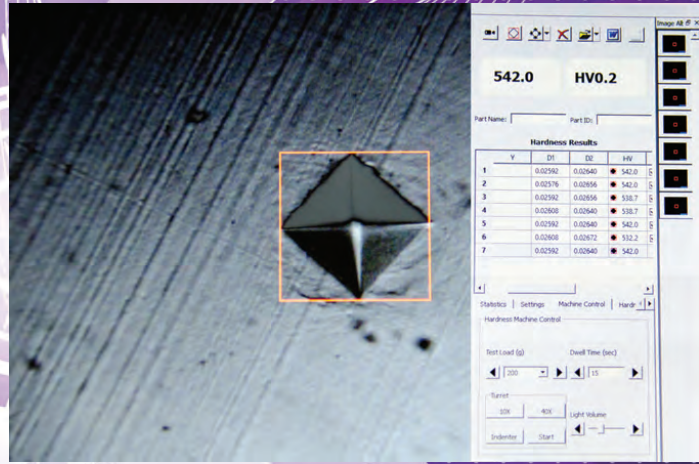
- Automatic scanning system for brinell impressions
- Friendly User Interface: Automatic measurement with a key stroke or a click of a button. Test results can be manually generated or corrected with a single mouse drag move
- High reliability: Advanced image processing and analysis technologies in automatic measurement. Field proven under severe sample surface conditions;
- Single camera with four magnifications: 1.3M pixel CMOS USB camera with two camera tubes with each tube height having two magnifications. Full measurement range is covered with four magnifications for better measurement accuracy. Specifically, tube 1 magnification #1 is suitable for indentation diameters 3-6mm, magnification #2 for 0.8-1.6mm, while tube 2 magnification #3 for 2-4mm, and magnification #4 for 1-2mm.

PHT-5000

Includes the basic functions of an imaging system such as image capture, camera calibration, image processing, geometric measurement, document labeling, and album management; automatically or manually measures the indentation diameter and calculates the hardness HB value; HB2 (DIN 1605 standard) automatic measurement: Automatically or manually measures the indentation diameters on the calibration sample and the test sample, and automatically interpolates the HB value for the test sample; Converts HB to other hardness scales—Validates the test results with sample dimensions; automatically updates the statistical values such as average, min and max, standard deviation, Cp and Cpk; **Auto-alarm:** Automatically marks the out of spec measurements; Test report: Automatically generates customizable WORD or EXCEL report.

42 Micro Vickers Hardness Tester with Video Cam, Adapter & Software

Specifications:	
Testing Range:	1HV-2967HV
Test Force:	0.098N(10g), .246N(25g), .49N(50g), 0.98N(100g) 1.96N(200g), 4.90N(500g), 9.80N(1000g)
Max Height of the Specimen:	70mm
Max Distance from the Indenter Center to the Instrument Panel:	95mm
Lens/indenters with:	With Hand Turret
Carriage Control:	Automatic (loading/holding-up of the load/ unloading)
Amplification of the microscope:	100x, 400x
Dwell Time of the Test Force:	(5-60)S
Min. Graduation Value of the Testing Drum Wheel:	0.25µm
Dimension of the XY Table:	100x100mm
Movement Field of the XY Table:	25x25mm
Light source/Power Supply:	110/220V,60/50Hz/Cold Light Source
Weight/Gross Weight:	92lbs/77lbs
Package Dimensions:	425x245x490mm



900-390A—Includes Video Cam, Adapter and Manual Measurement Software

900-390B—Includes Video Cam, Adapter and Auto-Measurement Software

This Micro Vickers hardness tester is a precise testing system suitable for hardness analysis of metallic specimens in metallography laboratories or production environments.

Software for 900-390A can be upgraded to 900-390B. Contact Phase II for further information

Micro Vickers Hardness Tester with Auto Turret with Video Cam, Adapter & Software



**Packages A, B & C can be upgraded at any time.
 Packages C&D only function with Phase II brand or similar machines.**

Contact Phase II for further information.

Technical Features:	
Testing Range:	1HV-2967HV
Test Force:	0.098N(10g), .246N(25g), .49N(50g), 0.98N(100g) 1.96N(200g), 4.90N(500g), 9.80N(1000g)
Max Height of the Specimen:	70mm
Max Distance from the Indenter Center to the Instrument Panel:	95mm
Lens/indenters with:	With Hand Turret
Carriage Control:	Automatic (loading/holding-up of the load/unloading)
Amplification of the microscope:	100x, 400x
Dwell Time of the Test Force:	(5-60)S
Min. Graduation Value of the Testing Drum Wheel:	0.25µm
Dimension of the XY Table:	100x100mm
Movement Field of the XY Table:	25x25mm
Light source/Power Supply:	110/220V,60/50Hz/Cold Light Source
Weight/Gross Weight:	92lbs/77lbs
Package Dimensions:	425x245x490mm

This Micro Vickers hardness tester is a precise testing system suitable for hardness analysis of metallic specimens in metallography laboratories or production environments.

Model No. 900-391A

Includes Video cam, adapter and manual measurement software

Model No. 900-391B

Includes Video cam, adapter and Auto-Measurement software

Model No. 900-391C

Includes Video cam, adapter and Turret control w/manual measurement software

Model No. 900-391D

Includes Video cam, adapter and Turret control w/ Auto-Measurement software

Model No. 900-391E

Includes Video cam, adapter, Automatic X & Y axis control, and auto Turret control w/ Auto-Measurement software

Model No. 900-391F

Includes Video cam, adapter, Automatic X, Y & Z axis control, and auto Turret control w/ Auto-Measurement software

Micro Vickers Hardness Tester

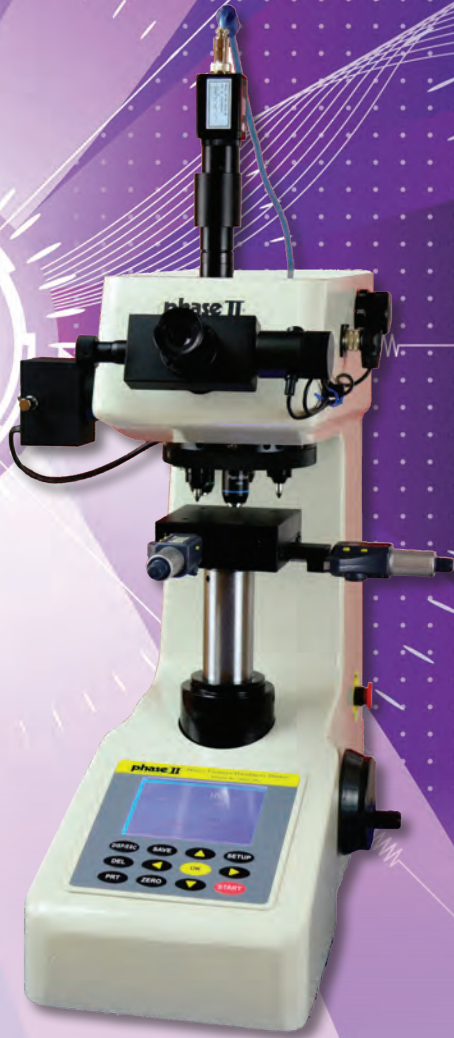
**Dual Penetrators!
Knoop & Vickers**

**3 Measuring Objectives!
10x, 20x, 40x**

- The Max. Height of the specimen: 90 mm
- The Max. Depth of the specimen: 12t0 mm (From the center)
- Power supply: AC110/220V, 60/50Hz
- Overall dimension (L x W x H): 495*305*550mm
- Weight: 33kg net

Specifications:

- Test Forces:** (gf) and (mN)
10, 25, 50, 100, 200, 300, 500, 1000(1K) gf
98, 245, 490, 980, 1960, 2940, 4900, 9800 Nm
- Test Scales:**
Vickers Scales: HV0.01, HV0.025, HV0.05, HV0.1, HV0.2, HV0.3, HV0.5, HV1
Knoop Scales: HK0.01, HK0.025, HK0.05, HK0.1, HK0.2, HK0.3, HK0.5, HK1
- Test mode:** HV / HK
- Language:** English / Chinese
- Test force application:** Automatic lifting system
- X-Y Testing Table**
 - Dimension: 100*100mm
 - Travel: 25*25 mm
 - Revolving power: 0.002mm
- Selection of hardness scale conversions**
- Dwell time of the test force:** 0~90s (5 sec increments)
- Turret:** Toggle between indenters and objectives:
Automatic recognition and manual
- Brightness:** adjustable



- Features:**
- 3 Measuring Objectives! 10x - 20x - 40x
 - Dual Indentors! Vickers and Knoop
 - Includes Auto-Turret, Video Cam, and Measurement software
 - Instant hardness scale conversions via supplied measurement software
 - Measurement software allows you to save the measuring data, pictures of indent, generate the hardness-depth curve and save as WORD or EXCEL document.

Three measuring objectives to choose from:

Eyepiece	Objective	Total Amplification	Min. Test Unit
10*	10*	100*	.25 μm
	20*	200*	0.03 μm
	40*	400*	0.015 μm

900-392A Vickers Hardness Tester

Includes Video cam, adapter and manual measurement software

900-392B Vickers Hardness Tester

Includes Video cam, adapter and Auto-Measurement software

900-392C Vickers Hardness Tester

Includes Video cam, adapter and Turret control w/manual measurement software

900-392D Vickers Hardness Tester

Includes Video cam, adapter and Turret control w/ Auto-Measurement software

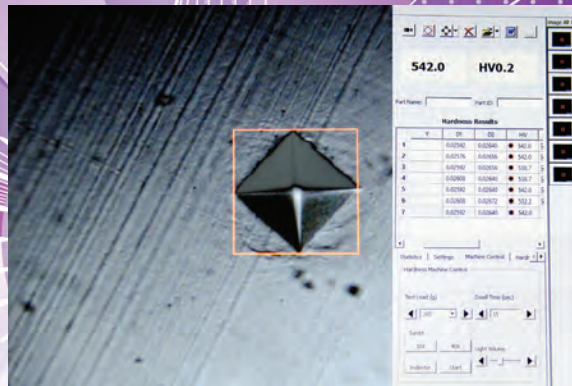
900-392E Vickers Hardness Tester

Includes Video cam, adapter, Automatic X & Y axis control, and auto Turret control w/ Auto-Measurement software

900-392F Vickers Hardness Tester

Includes Video cam, adapter, Automatic X, Y & Z axis control, and auto Turret control w/ Auto-Measurement software

Digital Macro Vickers Hardness Tester w/ built-in Printer 45



Main Accessories:

- Large test table
- "V" Shape test table
- 10X Digital Micro Lens
- Level
- Adjustable Screw
- Vicker Hardness Block
- RS232 Interface

Specifications:

Test Forces:	9.807, 19.61, 24.52, 29.42, 49.03, 98.07, 196.1, 249.2, 490.3 N 1, 2, 2.5, 3, 5, 10, 20, 30, 50kgf
Carriage Control:	(Load/Dwell/Unload)
Amplification of the Microscope:	100x 200x
Dwell Time of the Test Force:	(0-60)s
Min. Graduation Value of the Testing Drum Wheel:	0.125µm
Testing Field:	1HV-2967HV
Output:	Built-in Mini Printer RS-232
Max. height of the specimen:	170 mm
Max. width of the specimen:	130 mm
Objective:	10x 20x 40x selectable
Light source:	Cold light source
Power Supply:	110V/220V, 60/50Hz
Dimension:	535X225X580mm
Weight:	60 kg



Model No. 900-398A-Includes Video Cam, Adapter and Manual Measurement Software

Model No. 900-398B-Includes Video Cam, Adapter and Auto-Measurement Software

Our advanced line of Macro Vickers hardness testers are state-of-the-art, precise testing systems suitable for hardness analysis of metallic specimens in metallography laboratories or production environments.

The Phase II macro-vickers hardness testers are versatile and user-friendly systems.

Designed for the accurate hardness testing of small precision parts, thin materials, case hardened layers and all sorts of steel components. The Phase II 900-398 is our macro-vickers hardness tester, covering the load range from 1kg to 50kg, with digital technology. Conforming to ASTM E-384/92 vickers hardness testers standards, the 900-398 digital vickers hardness tester will offer unmatched repeatability. A perfect rugged performer suited for any environment, the Phase II vickers hardness testers are offered with a 5 year warranty and free lifetime technical support.

The 900-398 Vickers Hardness Tester is engineered to produce a clear indentation and a more precise measurement. By means of a load cell, closed circuit system for control, the CPU controls testing force to load/dwell/unload, allowing for the highest degree of accuracy. The large LCD shows the measuring methods, the testing force, the indentation length, hardness value, the dwell time of the testing force as well as the number of the measurement on its screen.

All information such as diagonal lines length of indentation, hardness values, data statistics and hardness conversions can be displayed on the LCD.

The tester can be adapted with a ccd camera for operation and data control via pc.

46 Touch Screen! Macro Vickers Hardness Tester

- The Max. Height of the specimen: 185 mm
- The Max. Depth of the specimen: 130 mm (From the center)
- Power supply: AC110/220V, 60/50Hz
- Overall dimension (L x W x H): 560 x 335 x 675 mm
- Weight: 65kg

Features:

- With three measuring objectives, automatic recognition and shifting between the objective and the indenter, automatically get the Vickers or Knoop hardness value.
- Instant hardness scale conversions.
- With several USB and RS232 interfaces, the hardness measurement can be printed out by USB interface (equipped with an external printer).
- It can automatically save the measuring data, generate the hardness-depth curve and save as WORD or EXCEL document.
- With X-Y automatic test table, automatic focusing and automatic measuring, it realizes the fully automation of Vickers hardness testing.

Technical Parameters:

1. Test Force
9.807, 19.61, 24.52, 29.42, 49.03, 98.07, 196.1, 294.2, 490.3N,
(1, 2, 2.5, 3, 5, 10, 20, 30, 50kgf)
2. Test mode: HV / HK
3. Language: English / Chinese
4. Test force application: Automatic lifting system
5. X-Y Testing Table
 - a) Automatic focusing
 - b) Dimension: 100 x 100mm
 - c) Travel: 50 x 50 mm
 - d) Revolving power: 0.002mm
6. Selection of hardness scale conversions
7. Dwell time of the test force: 0~60s (5 seconds as a unit)
8. Shifting method between indenter and objectives: Automatic recognition and manual
9. Brightness of the light source: adjustable
10. Digital camera pixel: 1.3 million
11. Optical system:



Three measuring objectives to choose from:

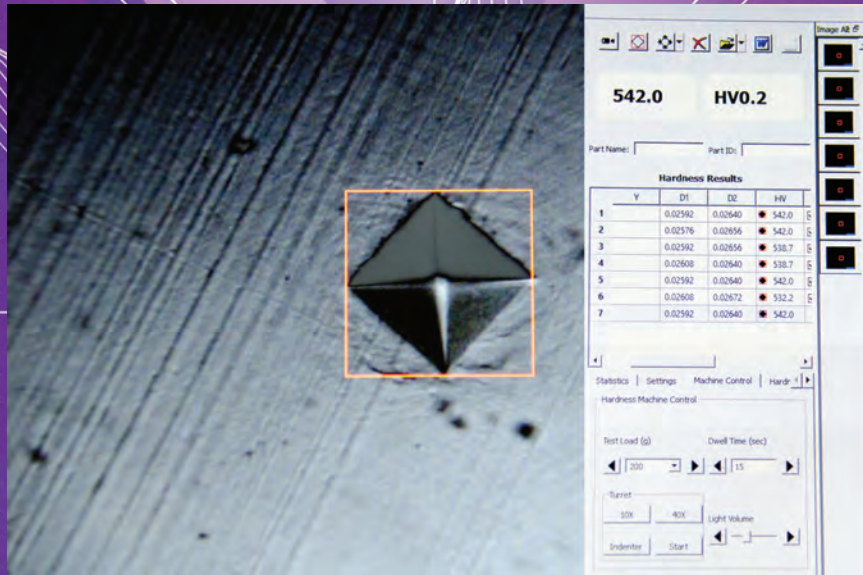
Eyepiece	Objective	Total Amplification	Min. Test Unit
10*	10*	100*	.25 μm
	20*	200*	.125 μm
	40*	400*	0.0625 μm

900-399 Special Order Only

All the testing parameters can be selected on the side panel computer. Using touch screen, it operates quickly and conveniently and displays clearly and intuitively. With CCD image acquisition system, it shows the image clearly and gets the hardness value just by touching the screen.

Measurement Software Packages for Vickers Hardness Testers

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Packages A, B & C can be upgraded at any time.
Packages C&D only function with Phase II brand or similar machines.

Contact Phase II for further information.

Model No. 900391-ASOFT: Includes video cam, adapter and manual measure software

Model No. 900391-BSOFT: Includes Video cam, Adapter and Auto-measure software

Model No. 900391-CSOFT: Includes Video cam, Adapter and Turret Control w/ manual measure software

Model No. 900391-DSOFT: Includes Video cam, Adapter and Turret Control w/ Auto-measure software

Model No. 900391-ESOFT: Includes Video cam, adapter, Automatic X & Y axis control, and auto Turret control w/ Auto-Measurement software

Model No. 900391-FSOFT: Includes Video cam, adapter, Automatic X, Y & Z axis control, and auto Turret control w/ Auto-Measurement software

The new Phase II measurement software packages include a high quality video cam and adaptor coupled with our extensive yet simple to use software. This combination can turn any manually operated micro vickers hardness tester into a world class measurement system that includes memory and USB output to a Word or Excel formatted file.

48 Vickers Accessories 2016



Thin Specimen Fixture

Part No. 900390-010

- Range: 0.1 - 6mm
- Diameter(Bottom): 76mm
- Height: 43mm



Vertical Holding Fixture

Part No. 900390-020

- Range: 0.6 - 4mm
- Diameter(Bottom): 60mm
- Height: 50mm



Clamping Fixture

Part No. 900390-030

- Max Opening: 45mm
- L-80 x W-76 x H-13.5mm



X-Y Stage w/Micrometers

Part No. 900390-050

- Graduation: 25mm x 25mm
- Table Size: 100 x 100 x 36mm



Diamond Indenters

Part No. 900390-0100 Micro Vickers

Part No. 900390-0150 Knoop

Made in USA-Certified

Part No. 900390-0100C Micro Vickers

Part No. 900390-0150C Knoop



Digital Micrometer Heads for X-Y

Part No. 900390-052



Motorized X-Y Stage w/Controller and Measurement Software Includes Video cam, Adapter and Turret Control w/ Auto-measure software

Part No. 900391-ESOFT

Hardness Tester Stand / Cabinet 49



900331-STAND

The Phase II hardness tester floor stand is a sturdy, heavy metal cabinet for securing your Rockwell, Brinell or Vickers hardness tester. The floor stand is supplied with adjustable feet, one drawer for storage of smaller parts and a large storage area for special fixtures. It is pre-drilled for an elevating screw.

The cabinets are approximately 18" wide by 23" deep by 27" high.

The Phase II stand will fit all Phase II brand hardness testers as well as many other name brand machines

SHIPPING WEIGHT: 103LBS

Rockwell Hardness Tester Blocks

3pc NIST certified test block kit

Part No. 900330-9410

3pc set includes HRC blocks w/NIST certification for each block in custom carry case

NIST Master Calibration Kit-C scale

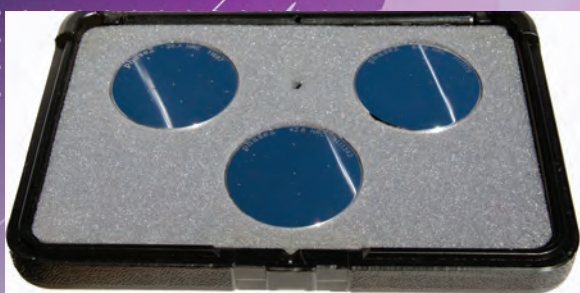
Part No. 900330-9410M

Kit includes same HRC test blocks as above as well as a certified diamond indenter in custom carry case

NIST Master Calibration Kit-C/N scale

Part No. 900330-9410Z

Kit includes same test blocks as above as well as a certified Combo C&N scale diamond indenter in custom carry case



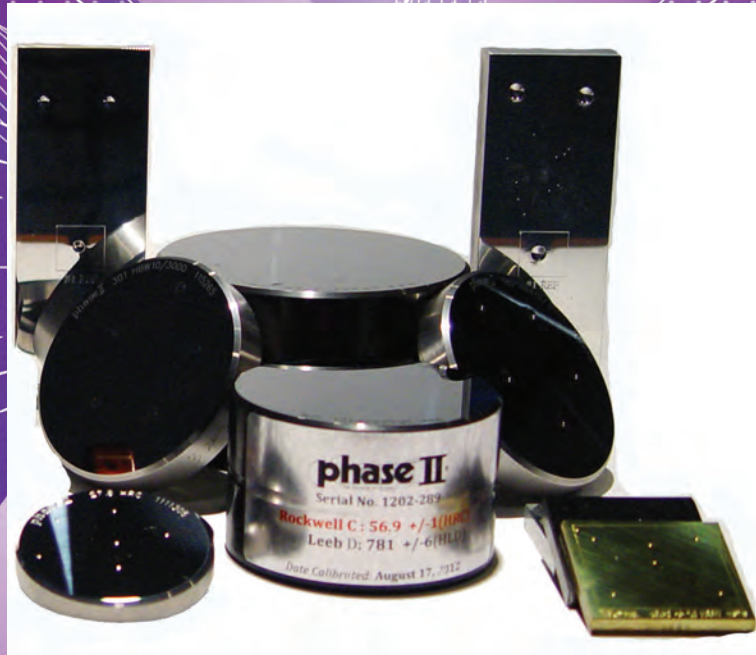
Features:

- Phase II offers a vast array of different hardness test blocks for Rockwell, Brinell and Vickers scales, as well as Portable hardness testers
- Phase II hardness test blocks are made of high grade materials to assure unmatched accuracy and repeatability throughout the entire block.
- Phase II Hardness test block surfaces are precision ground and lapped to an average finish of less than 2µin.
- Hardness Test blocks always engineered to obtain highly sensitive and accurate readings.
- All Made in the USA hardness test blocks conform to current ASTM specifications
- Traceability to NIST is offered on HRC steel blocks only.
- Prestigious Accredited laboratory AZLA and NVLAP in the USA used.

STEEL

Part No.	Description	Shape	Range	Comments
900330-9413	Rockwell A	Round	80-88	Phase II std.
900330-9414H	Rockwell B	Square	85-100	Made in USA
900330-9414L	Rockwell B	Square	60-80	Made in USA
900330-9414C	Rockwell B	Round	85-100	Phase II std.
900330-9414D	Rockwell B	Round	60-80	Phase II std.
900330-9415C	Rockwell C	Round	20-30's	Phase II std.
900330-9415D	Rockwell C	Round	20-30's	Phase II NIST certified
900330-9415E	Rockwell C	Square	20-30's	Made in USA/NIST cert.
900330-9416C	Rockwell C	Round	40's-50's	Phase II std.
900330-9416D	Rockwell C	Round	40's-50's	Phase II NIST certified
900330-9416E	Rockwell C	Square	40's-50's	Made in USA/NIST cert.
900330-9417C	Rockwell C	Round	60-70	Phase II std.
900330-9417D	Rockwell C	Round	60-70	Phase II NIST certified
900330-9417E	Rockwell C	Square	60-70	Made in USA/NIST cert.
900340-9001	Superficial HR15N	Round	70-91	Phase II std.
900340-9002	Superficial HR30N	Round	42-80	Phase II std.
900340-9003	Superficial HR45N	Round	20-70	Phase II std.
900340-9004	Superficial HR45T	Round	55-72	Phase II std.
900340-9005	Superficial HR30T	Round	43-82	Phase II std.
900340-9006	Superficial HR15T	Round	73-93	Phase II std.
900345-1015N-L	Superficial HR15N	Square	Low range	Made in USA
900345-1015N-M	Superficial HR15N	Square	Mid range	Made in USA
900345-1015N-H	Superficial HR15N	Square	High range	Made in USA
900345-1015T-L	Superficial HR15T	Square	Low range	Made in USA
900345-1015T-M	Superficial HR15T	Square	Mid range	Made in USA
900345-1015T-H	Superficial HR15T	Square	High range	Made in USA
900345-1030N-L	Superficial HR30N	Square	Low range	Made in USA
900345-1030N-M	Superficial HR30N	Square	Mid range	Made in USA
900345-1030N-H	Superficial HR30N	Square	High range	Made in USA
900345-1030T-L	Superficial HR30T	Square	Low range	Made in USA
900345-1030T-M	Superficial HR30T	Square	Mid range	Made in USA
900345-1030T-H	Superficial HR30T	Square	High range	Made in USA
900345-1045N-L	Superficial HR45N	Square	Low range	Made in USA
900345-1045N-M	Superficial HR45N	Square	Mid range	Made in USA
900345-1045N-H	Superficial HR45N	Square	High range	Made in USA
900345-1045T-L	Superficial HR45T	Square	Low range	Made in USA
900345-1045T-M	Superficial HR45T	Square	Mid range	Made in USA
900345-1045T-H	Superficial HR45T	Square	High range	Made in USA

Rockwell , Brinell, Vickers and LEEB Test Blocks 51



ROCKWELL B – ALUMINUM

Part No.	Description	Shape	Range	Comments
900330-9414AH	Rockwell B	Square	80's	Made in USA
900330-9414AL	Rockwell B	Square	50's	Made in USA
900330-9418H	Rockwell E	Square	90's	Made in USA
900330-9418L	Rockwell E	Square	60's	Made in USA

All of our Made in USA Brinell Test Blocks come certified to applicable standards. We adhere to a strict procedure for the calibration of these blocks, and the accuracy of the tester is maintained using a proving ring and load cell both traceable to N.I.S.T. The readings themselves are done using a stage micrometer also calibrated and traceable to N.I.S.T.

BRINELL

Part No.	Description	Shape	Range	Comments
900355-3000/150	3000kg Steel	Round	150-250	Phase II std.
900355-3000/250	3000kg Steel	Round	250-500	Phase II std.
900355-3030	3000kg Steel	Rectangle	100-200	Made in USA
900355-3040	3000kg Steel	Rectangle	250-350	Made in USA
900355-3050	3000kg/steel	Rectangle	350-500	Made in USA
900355-3060	3000kg/steel	Rectangle	500-600	Made in USA
900355-3010	3000kg	Rectangle	Low	Aluminum (USA)
900355-3020	3000kg	Rectangle	High	Aluminum (USA)

ROCKWELL B – BRASS

Part No.	Description	Shape	Range	Comments
900330-9414BH	Rockwell B	Square	80's	Made in USA
900330-9414BL	Rockwell B	Square	50's	Made in USA

VICKERS HARDNESS TEST BLOCKS

Part No.	Description	Range	Comments
900390-V010	Vickers (1 gram to 1,000 gram)	All	Made in USA
900390-V020	Heavy Load Vickers (1 Kg to 50 Kg)	All	Made in USA
900390-K010	Knoop (1 gram to 1,000 gram)	All	Made in USA

LEEB TEST BLOCKS

Part No.	Description	Range	Comments
PHT1300-01	Test Block for Leeb "D" (high HRC scale)	750-800	Phase II std.
PHT130001-CERT	NIST Certified Test Block for Leeb "D" (high scale HRC)	750-800	Phase II std.
PHT1300-02	Test Block for Leeb "D" (Mid Scale HRC)	590-670	Phase II std.
PHT130002-CERT	NIST Certified Leeb "D" Block (Mid Scale HRC)	590-670	Phase II std.
PHT1300-03	Test Block for Leeb "D" (Low scale HRC)	490-570	NIST Certified
PHT130003-CERT	NIST certified Leeb "D" Block (Low scale HRC)	490-570	For use with "G" impact devices
PHT1100G-01	Leeb Test Block for "G" impact device	590-670	
PHT1100G-CERT	ASTM Certified G Block for Brinell Scale	590-670	
PHT1300-05	Double Sided Leeb "D" Test Block	750-800	

Hardness Tester Penetrators & Anvils

NIST Vickers and Knoop Diamonds Available on Request

PENETRATORS: DIAMOND

Part No.	Description	Comments
900330-9440	Rockwell C scale	Phase II std.
900330-9440B	Rockwell C scale	Grade B (USA) Certified
900330-9440C	Combination C&N scale	Made in USA Certified
900385-9440	Rockwell C Scale	Phase II std.
900390-0100	Micro Vickers HV-6	Phase II std.
900390-0100C	Micro Vickers HV-6	Made in USA Certified
900390-0150	Knoop Indentor HV-4	Phase II Std
900390-0150C	Knoop Indentor HV-4	Made in USA Certified
900390-0150	Knoop Indentor HK-4	Phase II std.



NIST Vickers and Knoop Diamonds Available on Request

PENETRATORS: W/CARBIDE BALL

Part No.	Description	Comments
900330-9441	1/16" Carbide Ball	Phase II std.
900330-9441C	1/16" Carbide Ball	Certified (USA)
900330-18	1/8" Carbide Ball	Phase II std.
900330-18C	1/8" Carbide Ball	Certified (USA)
900330-14	1/4" Carbide Ball	Phase II std.
900330-14C	1/4" Carbide Ball	Certified (USA)
900330-12	1/2" Carbide Ball	Phase II std.
900330-12C	1/2" Carbide Ball	Certified (USA)
900355-010	Brinell 10mm Carbide Ball	Phase II std.
900355-010C	Brinell 10mm Carbide Ball	Certified (USA)
900355-050	Brinell 5mm Carbide Ball	Phase II std.
900355-050C	Brinell 5mm Carbide Ball	Certified (USA)
900355-025	Brinell 2.5mm Carbide Ball	Phase II std.
900355-025C	Brinell 2.5mm Carbide Ball	Certified (USA)



ANVILS: 20MM SHANK

Part No.	Description
900375-9405	2" Dia. Anvil (flat)
900375-9411	Large Dia. Anvil (Flat)
900375-9412	V-Anvil
900375-9406	1/2" Spot Anvil



ANVILS: 19MM SHANK

Part No.	Description
900331-9405	2" Dia. Anvil (flat)
900365-9406	Spot Anvil (10mm)
900365-9411	Large Dia. Anvil (Flat)
900365-9412	V-Anvil
900365-9413	X-Large Round Anvil (230mm)
900365-625	Combo Spot V / Spot Anvil
900365-630	Diamond Spot Anvil
900365-700	Goose neck for inner surface testing

Digital Shore Durometers 53



Shore A scale is for testing the following materials:

- Rubber:** Soft vulcanized (ie. tire), natural nitrile.
- Elastic materials (rubber & rubber like):** GR-S, GR-1, neoprene, thiokol.
- Other:** Wax, felt, leather etc. (materials that normally yield under fingernail pressure, such as the heel on your shoe).

Shore D scale is for testing the following materials:

- Rubber:** Hard
- Plastics:** Harder grades such as rigid thermoplastics, plexiglass, thermopolystyrene, vinyl sheet, cellulose acetate, thermosetting laminates (ie. formica)
- Other:** Paper filled calendar rolls, calendar bowls, etc. (materials that would not normally indent under fingernail pressure, such as a pocket comb or bowling ball).



Specifications:

- Measuring range: 0-100HSA (0-100 HSD)
- Resolution: 0.5H
- Digital read out
- Auto Hold feature
- Uses 1-SR44 Button Cell Battery
- Custom rugged carry case

Model No. PHT-960 Shore A Scale

Model No. PHT-980 Shore D Scale

Designed to test the hardness of Rubbers and Plastics

These sleek hand held hardness testers are crafted and engineered to perform at the highest level of accuracy. An ergonomic, lightweight design assists in taking precise and consistent hardness measurements.

54 Digital Shore Durometers



These testers are crafted and engineered to perform at the highest level of accuracy. An ergonomic and attractive design combined with lightweight assists in taking precise hardness measurements.

	PHT-950 Shore "A"	PHT-975 Shore "D"
Measurement Range	0-100HSA	0-100 HSD
Resolution	0.1H	0.1H
Digital Readout	Yes	Yes
Statistics	Yes Mean, Min, Max, No. of Measurements and Deviation	Yes Mean, Min, Max, No. of Measurements and Deviation
Power Supply	4 x AAA	4 x AAA
Low Battery Indicator	Yes	Yes

Test Blocks Not Included. See selection below:



- | | |
|------------------|--------------------------------------|
| PHT-950 | Digital Shore A Durometer |
| PHT-975 | Digital Shore D Durometer |
| PHT950-25 | 7pc Test Block Kit A (USA) |
| PHT950-20 | 7pc Test Block Kit A (import) |
| PHT975-25 | 3pc Test Block Kit D (USA) |
| PHT975-20 | 3pc Test Block Kit D (import) |

Accessories for Shore Durometers 55

Shore A & D Scale Test Block Kits



PHT950-25 7pc Shore A Test Block Kit (USA)
PHT950-20 7pc Shore A Test Block Kit (Import)

- Consists of 7 color coded test blocks that range from Ha 30's to Ha 90's.
- Designed for periodic verification of calibration accuracy.
- For use with all Shore A durometers
- Test kit is serialized for easy traceability
- Durometer results should be within +/-2 Durometer Points of stated test block value.

PHT975-25 3pc Shore D Test Block Kit (USA)
PHT975-20 3pc Shore D Test Block Kit (Import)

- Consists of 7 color coded test blocks that range from Ha 30's to Ha 90's.
- Designed for periodic verification of calibration accuracy.
- For use with all Shore A durometers
- Test kit is serialized for easy traceability
- Durometer results should be within +/-2 Durometer Points of stated test block value.

Shore A & D Scale Test Stands

These Phase II test stands are used to improve the accuracy and reproducibility of both analog and digital durometer hardness tester readings by ensuring that the presser foot is exactly parallel to the specimen table.

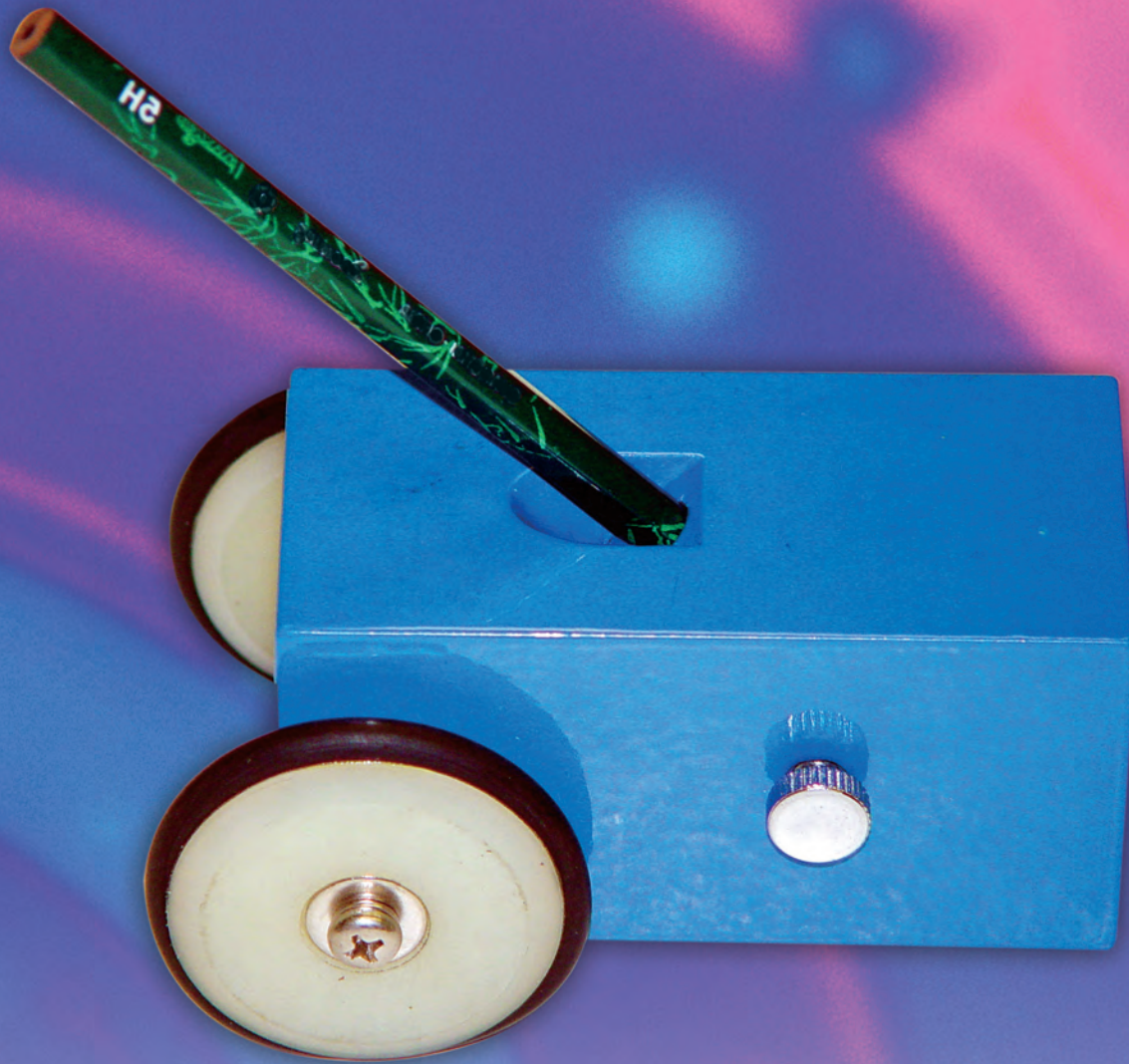


PHT-961
 Shore A Test Stand



PHT-981
 Shore D Test Stand

56 Coating Hardness Tester



A set of 14 calibrated wood drawing pencils is included from 6B to 6H.

PHT-995

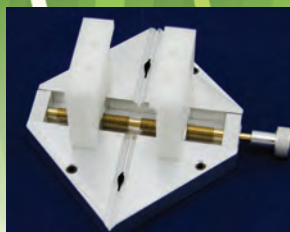
The Phase II Coating Hardness Tester is engineered to determine the resistance of coatings to scratch effects on the surface. Utilizing the Wolff/Wilborn principle, this coating hardness tester conforms to ASTM D 3363-05.

Pencils of various known hardness are dragged over the coating surface at a fixed angle and fixed pressure. Beginning with the hardest lead, graduating softer, movements of .250" (6.5mm) will determine where the surface area is/is not being gouged or scratched.

Pencils can be changed easily via a knurled thumb screw on the side of the instrument.



Shown w/optional small parts vise



The SRG-2000 determines surface roughness parameters Ra, Rz, Rms(Rq) and Rt within a wide measuring range. The piezo-electric pick-up stylus with diamond tip assures a very reliable measurement within tolerances that conform to ASME B46.1. Surface Roughness parameter Ra is computed to conform to ISO and Rz is computed to conform to DIN.

Surface Roughness parameter	Ra (ISO), Rz (DIN), Rms(Rq), Rt
Measuring range	Ra: 0.05-10.0μm / Rz: 0.1-50mm Rq: 0.05 ~ 10.0μm / Rt: 0.1 ~ 50μm
Resolution	0.01μm (1.6minch)
Cut-off lengths	0.0009in., 0.03in., 0.09in
Filter	RC analogue
Tracing length	0.23in (6mm)
Tracing speed	0.04in/second (1.0mm/second)
Accuracy	+/- 12% of actual Value
Pick-up stylus	Piezo-electric
Tracer tip	Diamond, radius 5μm
Operating temperature	32-104 degrees F (0-40 degrees C)
Power	3.6v / 2xNiMH batteries
Charger	9V DC
Contact force on probe	<1.8ozf (<50gf)
Static measuring force of sensor stylus	<0.06ozf (<1.6gf)
Dimensions	4.9 x 2.8 x 1.0in (125 x 73 x 26mm)
Weight	0.4lbs (200g)

The PHASE II SRG-2000 surface roughness tester comes complete with a compact durable carrying case, roughness standard, charger and instruction manual.

SRG-2000 Surface Roughness Tester

SRG2000-VISE

The PHASE II SRG-2000 surface roughness tester is a pocket-sized economically priced instrument for measuring surface roughness texture conforming to traceable standards. It can be used on the shop floor in any position, horizontal, vertical or anywhere in between.

The large LCD display shows either surface roughness parameter Ra, Rz, Rms(Rq) and Rt at the touch of a button, combined with the selected cutoff length. External calibration of the surface roughness values is possible by means of a special CAL button, which makes adjustment of this instrument very easy. A beep signal informs the user about each individual measurement status when ready.

The easy to use SRG-2000 surface roughness tester operates on various surfaces, not only flat but also outer cylinder, outer cone, grooves, and recesses greater than 80x 30mm. The areas of application are wide spread. It is suitable for inspection departments, quality control, on the shop floor during machining, during assembly in the field.

New!



Technical Specifications:

- Measures flat, Inside and Outside Diameters
- **Measures grooves and recessions:** wider than 0.16in (4mm)
- **Roughness parameters:** Ra, Rz, Rq, Rt, Rs, Rsm, Rmax, Rpc, Rmr
- **Roughness standards:** ISO/DIN/JIS/ANSI
- **Display resolutions:** 0.01µm/+/-20 µm | 0.02µm/+/-40 µm | 0.04µm/+/-80 µm
- **Measuring accuracy:** ≤±10%
- **Repeatability:** Less than or equal to 6%
- **Measuring range:** Ra, Rq: 0.01-40µm
Rz, Rt, Rm: 0.02-160µm
- **Maximum drive range:** 0.7in(17.5mm)
- **Cut-off length:** 0.009/0.03/0.09inch (0.25/0.8/2.5mm)
- **Tracing speeds:** speed 1mm/s (sampling length 2.5mm)
speed 0.5mm/s (sampling length 0.8mm)
speed 0.135mm/s (sampling length 0.25mm)
- **Sensor:** Inductance type
- **Sensor-stylus:** Diamond, radius 5µm
- **Pick up Force:** <4mN
- **Filter:** RC, PC-RC, GAUSSIAN, D-P
- **Data output:** USB
- **Operating temperature:** 41°F-104°F (5°-40°C)
- **Weight:** 0.97lb(440g)
- **Dimensions:** (119 x 47 x 65mm)
- **Power:** Li-Ion rechargeable battery
- Auto shut-off

Optional Accessories:

- 1) Precision Support Stand
- 2) Deep Groove Stylus
- 3) Small Hole Stylus
- 4) Curved Surface Stylus
- 5) Stylus Extension
- 6) Data Output Software

SRG-4600 comes supplied with:

- Calibrated Reference Standard w/support plate
- Leveling plate
- Stylus protector
- A/C Adapter
- Rugged Carry case

Features:

- 9 Different roughness parameters
- Inside/Outside Diameters
- Stylus position indicator
- USB output to PC
- Large Memory



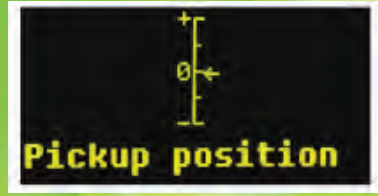
SRG-4600

The newest addition to our state-of-the-art surface roughness testers profilometer, the SRG-4500 will instill the highest level of confidence in your production, shop floor or QC lab. Extended memory and output coupled with multiple useful functions the SRG-4600 surface roughness tester profilometer is clearly the new leader in ultra accurate surface profile testing.

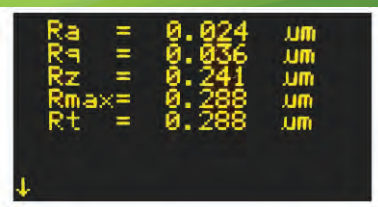
SRG-4600 Surface Roughness Gauge Accessories 59



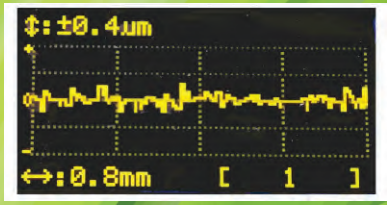
Main Screen



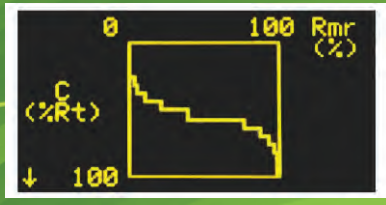
Stylus Position



Parameters



Roughness Profile



Ratio Curve



SRG4000-050
Precision Support Stand
 Can be used with either 4000, 4500, 4600 series roughness gauges.



SRG4600-200
Deep Groove Stylus
 For use on deep grooves with min. width of 3mm and max depth of 10mm. *Must be used with support stand.*



SRG4600-100
Standard 5µm Stylus
 For use on flat and slightly curved surfaces.



SRG4600-500
2" Stylus Extension
 Adds extra 2" reach for deeper applications.



SRG4600-300
Small Hole Stylus
 For use in small holes under 2mm diameter and max depth of 4mm.



SRG4600-400
Curved Surface Stylus
 For use on curved surface with a minimum curvature radius of 3mm. *Must be used with support stand.*

SRG4600-550
5" Stylus Extension
 Adds extra 2" reach for deeper applications.

60 Portable Surface Roughness Gauge



Optional Accessories:

SRG4000-050	Precision Support Stand
SRG4000-110	Stylus Extension
SRG4000-130	2 μ m Diamond Stylus
SRG4000-140	Stylus for Grooves
SRG4000-150	Stylus for Curved Surfaces

Features:

- 4 Different roughness parameters
- Inside/Outside Diameters
- Stylus Level Indicator



Roughness parameter	Ra, Rz, Rq(RMS), Rt
Assessed Profiles	Primary profile(p), Roughness profile(R) tp curve (Mr)
Conformance Standards	ISO/DIN/JIS/ANSI
Measuring System	Metric μ m, Imperial pinch
Display Resolution	+/-20 μ m = 0.001 μ m +/-40 μ m = 0.002 μ m +/-80 μ m = 0.004 μ m
Display Range	Ra, Rq: 0.005 μ m up to 16 μ m Rz, Rt: 0.02 μ m up to 160 μ m
Pick Up Measuring Range	+/- 80 μ m
Sensor Specifications	5 μ m Diamond Tip Stylus
Sensor Angle	90°
Contact Force	4mN (0.4gf)
Display features	SStylus position sensor Battery level indicator Direct display of parameters Direct printing Auto-off with auto store
Cut-off lengths	0.25mm/0.8mm/2.5mm
Tracing length Lt	1.3mm - 17.5mm
Digital Filter	RC, PC-RC, GUASSIAN, D-P
Traverse Length	Selectable 1,3 or 5
Power	Li-Ion battery
Working temperature	5-40 degrees C.
Dimensions	139mm x 56mm x 48mm
Weight	1 lb.

SRG-4000 Surface Roughness Tester

SRG4000-050 Optional Precision Test Stand

Ultrasonic Thickness Gauge with Scan Feature



THE MOST POPULAR MODEL!



Display type	4-digit LCD w/Back Light
Minimum display unit	0.001"/0.01mm (selectable)
Measuring Range	0.040-12.0" in steel w/standard probe
Accuracy	+/- (0.5% thickness + .001")
Sound velocity range	3280-32805 ft/s (1000-9999m/s)
Upper/Lower Limit Preset Alarm	Yes
Operating temperature	32-122 degrees F
Frequency	5MHz
Update range	4Hz
Memory	20 Groups (100 files/group)
Output	USB
Mini-Printer	Optional
Power supply	3v AA alkaline batteries (2pc)
Battery life	Approx. 100 hours (w/backlight off)
Power consumption	Working current is less than 3V
Dimensions	5.90" x 2.91" x 1.30" (150 x 74 x 33mm)
Weight	8.6oz (245g)

REFER TO PAGE 66 FOR ULTRASONIC ACCESSORIES

UTG-2800

State of the art, digital tester is packed with features typically found on high end models only. This multi-functional unit offers everything from basic measurement, Scanning Capabilities, Adjustable Sound Velocity, extended memory and USB output capabilities. This dynamic sonic gauge is designed to measure the thickness of metallic and non-metallic materials such as steel, aluminum, titanium, plastics, ceramics, glass and any other good ultrasonic wave conductor as long as it has parallel top and bottom surfaces.

The UTG-2800 will accurately display readings in either inch or millimeter after a simple calibration to a known thickness or sound velocity.

62 Ultrasonic Thickness Gauge w/ Thru Coat and Ext. Measuring Range



Measures Thru Paint!

Display type	4.5 -digit LCD w/Back Light
Minimum display unit	0.001"/0.01mm (selectable)
Measuring Range	Pulse-Echo: 0.025"-23.0" in steel Echo-Echo: 0.118" - 2.35"
Accuracy	+/- (0.5% thickness + .001")
Sound velocity range	3280-32805 ft/s (1000-9999m/s)
Upper/Lower Limit Preset Alarm	Yes
Scanning Feature	Yes, 16 measurements/second
Operating temperature	32-122 degrees F
Frequency	5MHz
Update range	4Hz
Memory	20 Groups (100 files/group)
Output	USB
Power supply	AA alkaline batteries (2pc)
Battery life	Approx. 100 hours (w/backlight off)
Power consumption	Working current is less than 3V
Dimensions	5.90" x 2.91" x 1.30" (150 x 74 x 33mm)
Weight	8.6oz (245g)

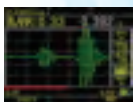
Comes complete with Certificate of Calibration, Operation Manual and Custom Carry Case.

UTG-2900

Our new State of the art, digital tester is packed with features typically found on high end models only. This multi-functional unit offers everything from basic measurement, Thru Coating capabilities, Scanning Capabilities, Adjustable Sound Velocity, extended memory and USB output capabilities. This dynamic sonic gauge is designed to measure the thickness of metallic and non-metallic materials such as steel, aluminum, titanium, plastics, ceramics, glass and any other good ultrasonic wave conductor as long as it has parallel top and bottom surfaces. The UTG-2900 will accurately display readings in either inch or millimeter after a simple calibration to a known thickness or sound velocity.

Ultrasonic Thickness Gauge w/A & B Scan and Thru Coating Capability

Operating Principle	Ultrasonic pulse/echo method with dual element probe
Display type	2.4" Color Screen
Resolution	0.001", .01" /0.01mm (selectable)
Measuring Range	0.02-20.0" (10mm-145mm) Dependent upon probe & material
Repeatability	+/-0.001" (+/-0.05mm)
Sound velocity range	0.0197-0.3937in/us (500-9999m/s)
Measuring Error:	0.001" (up to 0.984") 0.007" (up to 3.03") 0.019" (4" and above)
Display Modes:	Digital Thickness Readout A-scan or Waveform Min/Max Capture D-Value / Reduction
V-Path Correction	Automatic
Update rate	Selectable: 4Hz, 8Hz, 16Hz
Refresh rate	4/second
Alarm Settings	Min/Max Alarm Dynamic waveform color change on alarm
Operating temperature	14-122°F (-10°C - +50°C)
Auto Shut-Off	After 5 minutes
Power supply	3v AA alkaline batteries (2pc)
Operating Time	Approx. 36 hours
Dimensions	6.02" x 2.99" x 1.45" (153 x 76 x 37mm)
Weight	9.9oz (280g)



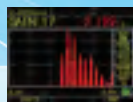
UTG-4000 Ultrasonic thickness gauge-Blanking



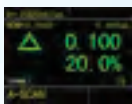
UTG-4000 Ultrasonic Thickness Gauge - Adjustable Gate



UTG-4000 Ultrasonic Thickness Gauge - Configuration Mode



UTG-4000 Ultrasonic Thickness Gauge - Alarm Mode



UTG-4000 Ultrasonic thickness gauge-Blanking



UTG-4000 Ultrasonic Thickness Gauge - Min/Max Mode



UTG-4000 Ultrasonic Thickness Gauge - Color B Scan

UTG-4000

Utilizing color waveform A-scan and time based B-scan for absolute correctness, this state of the art ultrasonic thickness gauge is packed with useful features allowing users to be confident of the displayed values on the most critical of applications. These multi-functional ultrasonic thickness gauges offer everything from basic measurement, Scan mode with Min/Max viewing, GO/NO GO display, Adjustable Sound Velocity and Thru-Coating Capabilities. This dynamic ultrasonic thickness gauge is designed to measure the thickness of metallic and non-metallic materials in critical situations that ordinary thickness gauges couldn't do.

64 Ultra Precise Ultrasonic Thickness Gauge



NIST CERTIFIED



Display type	4-digit LCD w/ Backlight
Display Resolution	Inch: 0.01", 0.001" or 0.0001" (selectable) Metric: 0.1mm, 0.01mm or 0.001mm(selectable)
Measuring Range	Standard Mode: 0.010" - 0.787" (steel)
Accuracy	+/-0.0002" (0.005mm) if thickness < 3mm +/-0.002" (0.05mm) if thickness < 20mm
Sound velocity range	3280-32805 ft/s (1000-9999m/s) Adjustable
Upper/Lower Limit Preset Alarm	Yes
Operating temperature	32-122 degrees F
Refresh Frequency	4Hz up to 25Hz
Memory	500 Test Values
Output	N/A
Power supply	AA alkaline batteries (2pc)
Battery Life	Approx. 200 hours (w/backlight off)
Power consumption	Working current is less than 3V
Dimensions	5.86" x 2.87" x 1.25" (149 x 73 x 32mm)
Weight	5.6oz (160g)

UTG-2650 comes complete with Certificate of Calibration, Couplant Gel, Operation Manual and Custom Carry Case.

UTG-2650

State of the art ultrasonic technology allows you to obtain ultra precise thickness measurements and store them to memory. This digital tester is capable of reading wall thickness down to 0.010" with a super high adjustable resolution of up to 0.0001". This dynamic sonic gauge is designed to measure the thickness of metallic and non-metallic materials such as steel, aluminum, titanium, plastics, ceramics, glass and any other good ultrasonic wave conductor as long as it has parallel top and bottom surfaces. The UTG-2650 will accurately display readings in either inch or millimeter after a simple calibration to a known thickness or sound velocity.

Ultrasonic Thickness Gauge Economy 65



NIST CERTIFIED







Comes complete with Certificate of Calibration, Couplant Gel, AA Batteries, Operation Manual and Custom Carry Case.

Display type	3-digit LCD
Resolution	0.001"/0.01mm
Measuring Range	0.04" to 8.0"
Sound velocity range	3280-32805 ft/s (1000-9999m/s)
Operating temperature	32-122 degrees F
Frequency	5MHz
Update range	4Hz
Memory	N/A
Output	N/A
Printing	N/A
Power supply	4-AAA batteries
Battery life	Approx. 250 hours/set
Power consumption	Working current is less than 3V
Dimensions	4.9" x 2.6" x 0.9" (161 x 69 x 32mm)
Weight	0.7lbs (300g)

UTG-1500

This handheld unit has precise touch and read capabilities yet is economically priced. The UTG-1500 is designed to measure the thickness of metallic and non-metallic materials such as aluminum, titanium, plastics, ceramics, glass and any other good ultrasonic wave conductor as long as it has parallel top and bottom surfaces. The UTG-1500 will accurately display readings in either inch or millimeter after a simple calibration to a known thickness or sound velocity.

66 Ultrasonic Accessories

Part Number	UTG4000-400	UTG2800-750	UTG2600-400	UTG2000-440	UTG2000-450	UTG2800-400
Probe Style	Standard	Small Tube	Extreme small tube	Rough surface/Porous Metal	Hi-Temp	Standard
Frequency	5MHz (E-E)	7.5 MHz	10 MHz	2 MHz	5 MHz	5MHz
Contact Dia.	8mm	6mm	4mm	17mm	15mm	10mm
Measure range	.031-8.0"	.031-1.18"	.030-.787"	.157-20"	.157-3.14"	.040-12"
Temperature	14-158°F	14-158°F	14-158°F	14-158°F	0-572°F	14-158°F
Image						

Part Number	UTG2900-400	UTG2000-420	UTG1500-400	UTG2000-400	UTG2650-400
Probe Style	Standard	Small Tube	Standard	Standard	Standard
Frequency	5MHz (E-E)	5 MHz	5 MHz	5 MHz	5MHz Delay Line
Contact Dia.	10mm	6mm	8mm	12mm	6mm
Measure range	.031-23.0"	.031-1.18"	.040-8.0"	.040-8.0"	P/E: 0.010" - 0.787" E/E: 0.012" - 0.394"
Temperature	14-158°F	14-158°F	14-158°F	14-158°F	14-158°F
Image					



UTG1000-850 Couplant Gel 5-Liter

UTG1000-808 Couplant Gel 8oz

- Water based and water soluble
- Slow drying with good transducer lubrication
- Extended ambient temperature range
- Stable couplant that holds on a vertical and overhead surfaces and fills depressions in rough surfaces
- MSDS available by request

UTG-0500 5-Step Calibration Block

1018 Steel
.100" thru .500"



Coating Thickness Gauge 67



Main Technical Data:

- **Measuring range:** 0-1,250 µm max. or 0-50 mils
- **Resolution:** 1 µm/0.1 mils (0-99 µm)
- **Accuracy:** +/- 3% + 2 µm (+/-3%+0.1 mil)
- **Display:** 3 digit color LCD
- **Single or Continuous Measurement:** Selectable
- **Min. measuring area:** 0.2" x 0.2" (5mm x 5mm)
- **Min. radius of curvature:** Convex: 0.12" (3mm)
Concave: 1.2" (30mm)
- **Min. substrate thickness:** Ferrous: 20 mils (0.5mm)
Non-ferrous: 2 mils (50 µm)
- **Max. Surface temperature of test object:** 302 degrees F
(contact time max is 2 seconds)
- **Power Source:** 2-AAA batteries
- **Dimensions:** 100 x 52 x 29mm
- **Weight:** 2.4oz. (w/o Batteries)

PTG-4000

The PHASE II PTG-4000 can perform two different methods of calculating thickness measurement by utilizing the characteristics of both eddy current and magnetic induction. Testing performance is both non-destructive and extremely accurate. With this state of the art thickness gage, you can easily detect the thickness of nonmagnetic coating on a magnetic substrate (ferrous) or an insulating coating on a non-magnetic conductive substrate (non-ferrous) utilizing our auto-detect, integrated probe. Can be used in many areas of industry including automotive auctions, manufacturing, general engineering, commercial inspection, etc. Utilizes an integrated probe that can automatically detect a Ferrous or Non-Ferrous substrate and comes with 2 substrate samples(steel,aluminum), 4 calibrated thickness samples, carry case, batteries and operation manual.

Coating Thickness Gauge



Main Technical Data:

- **Measuring range:** 0-1000µm or 0-40mils
- **Resolution:** 0.1µm/0.01mils(0-99µm) or 1m m (over 100µm)
- **Guaranteed tolerance:** After one-point calibration: $\pm 1-3\%$ or 2 µm (whichever is greater)
- **Display:** 4 digits (digit height = 10mm/0.4")
- **Min. measuring area:** 0.2" x 0.2" (5mm x 5mm)
- **Min. radius of curvature:** Convex: 0.12" (3mm) Concave: 1.2" (30mm)
- **Min. substrate thickness:**
Ferrous: 20 mils (0.5mm)
Non-ferrous: 2 mils (50 mm)
- **Calibration:**
Zero Calibration/Foil calibration
* Max. Surface temperature of test object:
302 degrees F
(contact time max is 2 seconds)
- **Power source:** 4-AAA batteries
- **Dimensions:** 161 x 69 x 32mm
- **Weight:** 9oz. (260g)

Coating thickness measurement with Flip Display!

PTG-4200

The PHASE II PTG-4200 can perform two different methods of calculating thickness measurement by utilizing the characteristics of both eddy current and magnetic induction.

Testing performance is both non-destructive and extremely accurate.

With this state of the art thickness gages, you can easily detect the thickness of nonmagnetic coating on a magnetic substrate (ferrous) or an insulating coating on a nonmagnetic conductive substrate (nonferrous) utilizing our auto detect, integrated probe.

The PTG-4200 coating thickness gauge can be used in many areas of industry including automotive auctions, manufacturing, general engineering, commercial inspection, etc.

Coating Thickness Gauge 69



PTG-3700/3725

The PHASE II PTG-3700 series of gauges can perform two different methods of calculating thickness measurement by utilizing the characteristics of both eddy current and magnetic induction.

Testing performance is both non-destructive and extremely accurate.

With these state of the art thickness gages, you can easily detect the thickness of non-magnetic coating on a magnetic substrate (ferrous) or an insulating coating on a non-magnetic conductive substrate (non-ferrous) utilizing either an integrated probe or our version that comes with an external probe.

The PHASE II PTG-3700/3725 can be used in many areas of industry including automotive paint measurement, manufacturing, general engineering, commercial inspection, etc.

The PTG-3700 utilizes an integrated probe that can automatically detect a Ferrous or Non-Ferrous substrate and comes with 2 substrate samples (steel,aluminum), 4 calibrated thickness samples, carry case, batteries and operation manual.

The PTG-3725 utilizes two external probes for ferrous and non-ferous substrates. Comes with 2 substrate samples(steel,aluminum), 4 calibrated thickness samples, carry case, batteries and operation manual.



Main Technical Data:

- **Measuring range:** 0-1000 μ m or 0-40mils
- **Resolution:** 0.1 μ m/0.01mils(0-99 μ m) or 1m m (over 100 μ m)
- **Guaranteed tolerance:** After one-point calibration: =/- 1-3% n or 2 μ m (whichever is greater)
- **Display:** 4 digits (digit height = 10mm/0.4")
- **Min. measuring area:** 0.2" x 0.2" (5mm x 5mm)
- **Min. radius of curvature:** Convex: 0.12" (3mm) Concave: 1.2" (30mm)
- **Min. substrate thickness:** Ferrous: 20 mils (0.5mm) Non-ferrous: 2 mils (50 mm)
- **Calibration:** Zero Calibration/Foil calibration
* Max. Surface temperature of test object: 302 degrees F (contact time max is 2 seconds)
- **Power source:** 4-AAA batteries
- **Dimensions:** 161 x 69 x 32mm
- **Weight:** 9oz. (260g)

PTG-3500

The PHASE II PTG-3500 series of gages can perform two different methods of calculating thickness measurement by utilizing the characteristics of both eddy current and magnetic induction. Testing performance is both non-destructive and extremely accurate. With these state of the art thickness gages, you can easily detect the thickness of non-magnetic coating on a magnetic substrate (ferrous) or an insulating coating on a non-magnetic conductive substrate (non-ferrous) utilizing either an integrated probe or our version that comes with an external probe. The PHASE II PTG-3500 can be used in many areas of industry including manufacturing, general engineering, commercial inspection, etc.

Comes with 2 substrate samples(steel,aluminum), 4 calibrated thickness samples, carry case, batteries and operation manual.

Analog Force Gauges 71



Model No.	Capacity	Resolution
AFG-0100	2 lb/0.90kg	0.01
AFG-0200	4.5 lb / 2.0kg	0.02
AFG-0300	10 lb/4.53kg	0.05
AFG-0400	22.5 lb / 10kg	0.1
AFG-0500	50 lb/22.67kg	0.25
AFG-0600	100 lb/45.36kg	0.5

Features:

- Heavy-Duty Construction
- Direct Dial Readings in lbs/kg
- Extreme Accuracy to +/- 1% Full Scale
- Designed for tension/compression measurements
- Versatile range of gages are supplied in complete test kit form containing full set of accessories and carry case.
- Can be hand-held or mounted to optional test stand

AFG-0100 2lb Analog Force Gauge

AFG-0200 4.5lb Analog Force Gauge

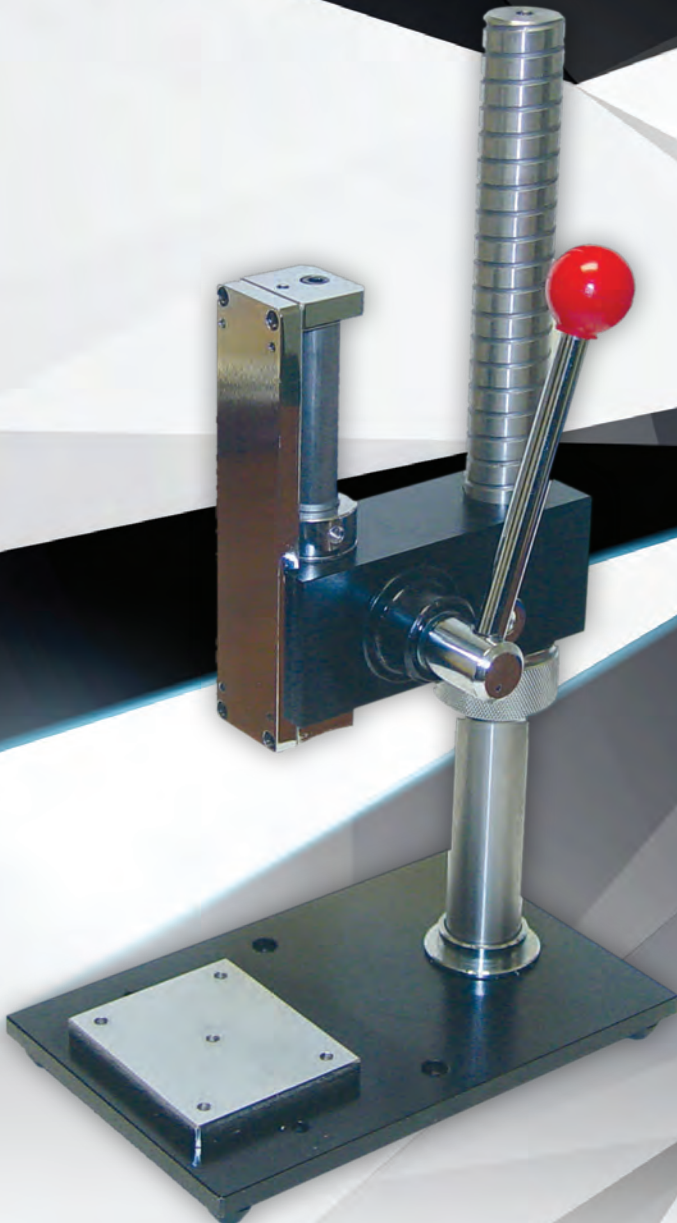
AFG-0300 10lb Analog Force Gauge

AFG-0400 22.5lb Analog Force Gauge

AFG-0500 50lb Analog Force Gauge

AFG-0600 100lb Analog Force Gauge

72 Test Stand for Force Gauges

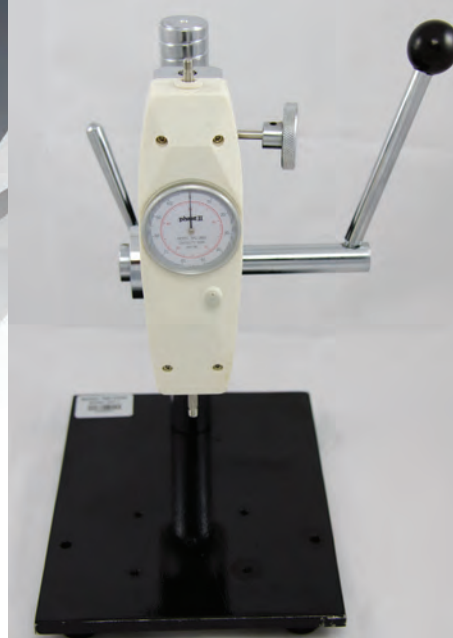


Features:

- Universal design enables user the ability to test multiple physical properties such as insertion, withdrawal, tension, compression and fracture type tests.

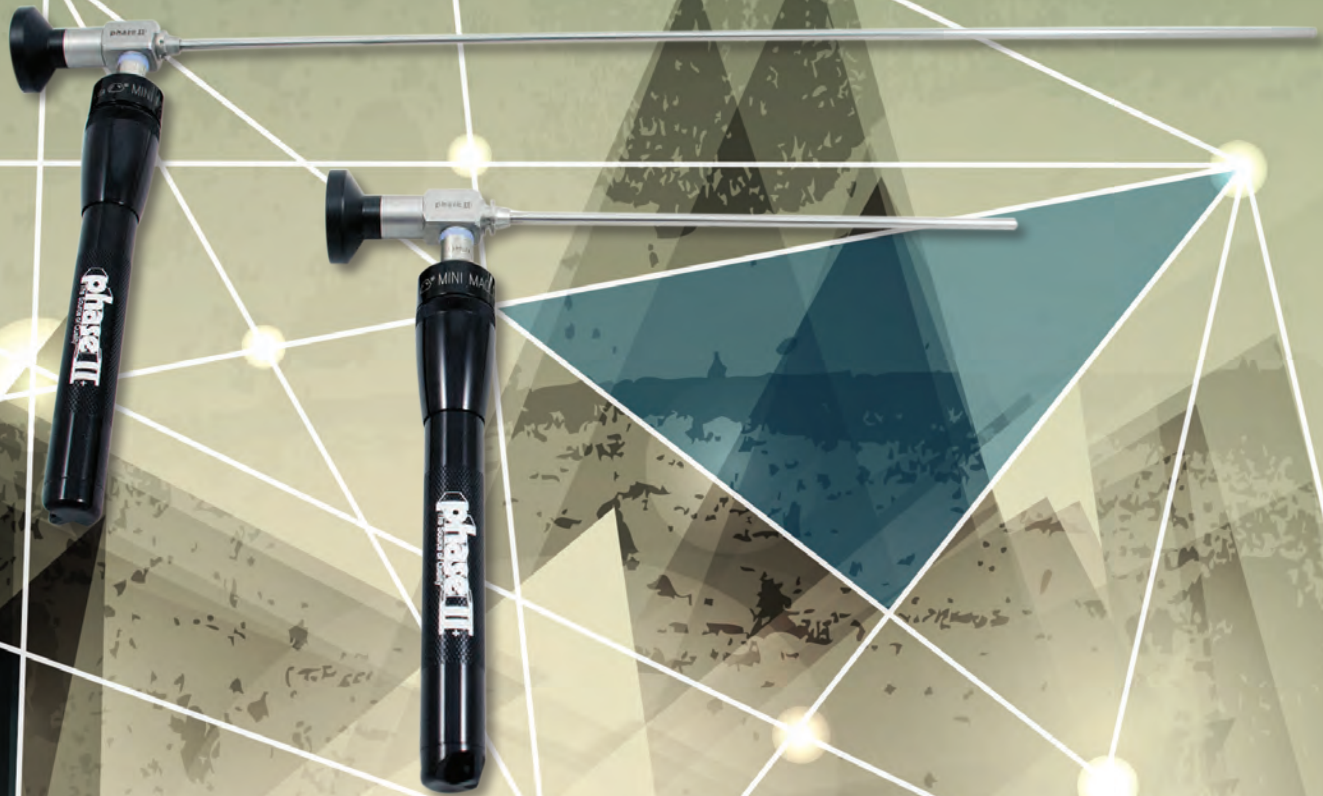
Dimensions:

Length: 9.25" (235mm)
Width: 5.98" (152mm)
Height: 15.75" (400mm)
Weight: 22 lbs



AFG-1000

Universal design enables user the ability to test multiple physical properties such as insertion, withdrawal, tension, compression and fracture type tests



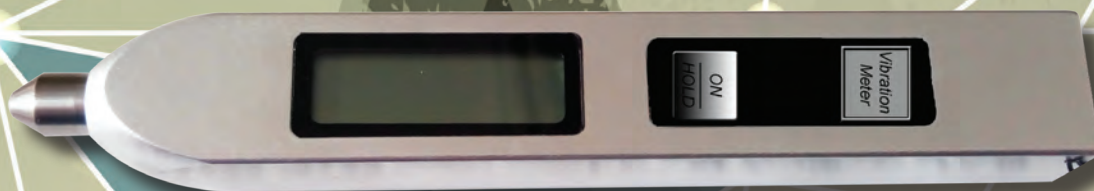
Dimensions	RGB-1000
Working Length	7"
Overall Length	9"
Diameter of tube	.160" (4mm)
Field of View	65° Wide Angle
Magnification	2x

Features:

- Portable, rugged design enables user to view critical components in high resolution through access holes as small as .160" (4mm).
- RGB-1000 Utilizes a Super bright LED Light source operated by 2 AA Batteries
- Built-in light source affords user extreme versatility anywhere in the shop.

RGB-1000 7" Rigid Borescope Kit

74 Pocket Vibration Meter



Measuring Range	RMS Vibration velocity 0.1mm/s to 199.9 mm/s
Frequency Range	10Hz to 1000Hz
Display	3.5 digit LCD
Accelerometer	Integrated
Power Supply	1.5v button cell batteries (2)
Operating Temp	0-40°C <86%RH
Dimensions	150 x 22 x 18mm
Weight	2.0oz.

DVM-0500/0600 comes complete with Certificate of Calibration, Operation Manual and Carry Case.

DVM-0500 Pocket Vibration Meter (mm)

DVM-0600 Pocket Vibration Meter (in)

The DVM-0500/600 is a hand held device that is designed to aid in the preventative maintenance of machinery or any other object in motion by picking up vibrational changes over a period of time. Commonly used to check balance, misalignment of bearings. Useful features include last value hold and auto shut off make the DVM-0500/600 a must have for maintenance personnel.

Digital Vibration Tester 75



Acceleration	Peak Value: 0.1-400m/s ² or 0.3-1312ft/m/s	Frequency Range: 10Hz-1KHz Frequency Range: 10Hz-10KHz
Velocity(RMS)	RMS: 0.1-400 (mm/s) or 0.004 -16.0 inch/s	Frequency Range: 10Hz-1KHz
Displacement	peak to peak: 0.001-4.0mm or 0.04-160mil 10Hz-1KHz	Frequency Range: 10Hz-500Hz
RPM Frequency	5-100,000 r/min	
Frequency	0.1 - 10KHz	
Accuracy	<5%	
Operating Temp	0-45°C	
Power	4-AAA Batteries	
Dimensions	161 x 69 x 32mm	
Weight	10.5 oz.	

Features:

- Quick accurate analysis for checking balance and alignment of a rotating object.
- Large LCD display
- Statistics: Mean, Max, MIN, No. of Measurements and Std deviation
- Inch/Metric Conversion with the push of a button
- Max Hold Function
- Regulated Output(AC output 2.0v peak full scale)

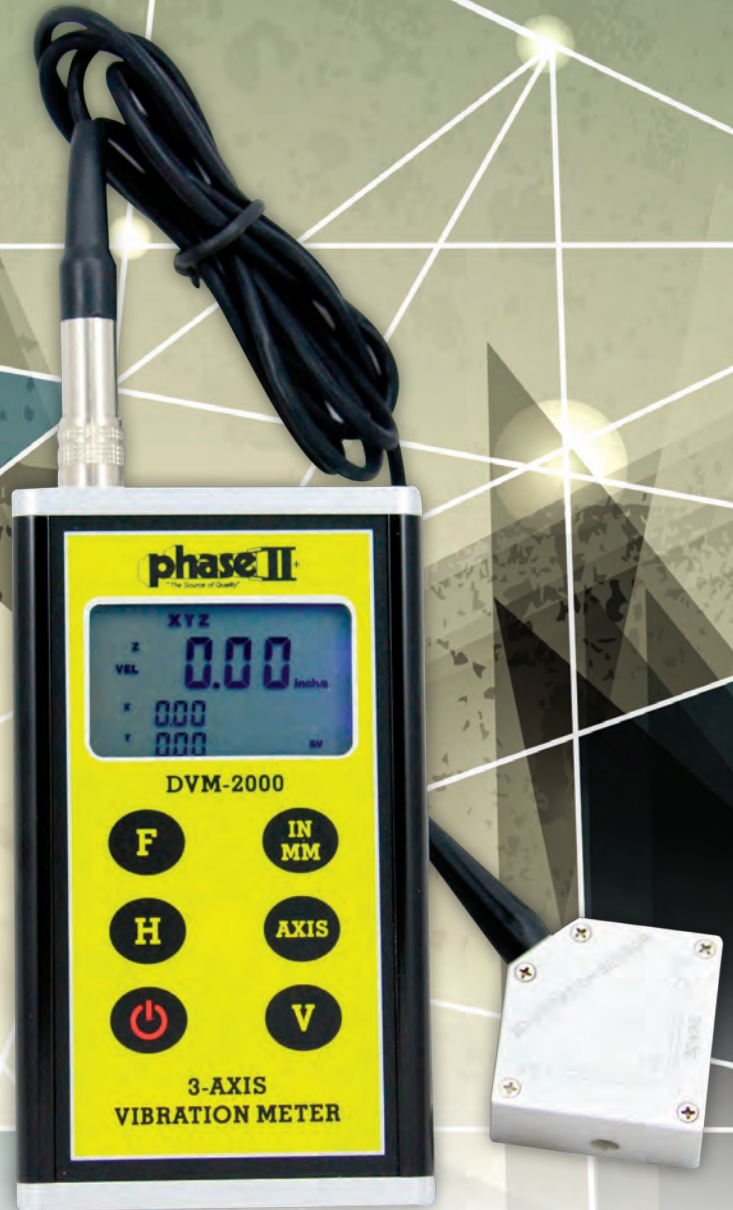
DVM Includes:

- 1-Powerful Magnet
- 1-Accelerometer
- 1-Stinger Probe (cone)
- 1-Stinger Probe (Ball)
- Operation Manual
- Carry Case

Multi-functional meter is capable of measuring Velocity, Acceleration, Displacement and RPM Frequency.

DVM-1000 Digital Vibration Tester

76 3-D Vibration Meter



Multi-functional meter is capable of measuring Velocity, Acceleration and Displacement utilizing its 3-Axis Piezoelectric accelerometer

Features:

- Quick accurate analysis for checking balance and alignment of a rotating object.
- 3-Axis Accelerometer (X, Y, Z or XYZ)
- Large LCD display w/backlight
- Inch/Metric Conversion with the push of a button
- Max Hold Function
- Regulated Output(AC output 2.0v peak full scale)
- Rugged All Metal Body Construction

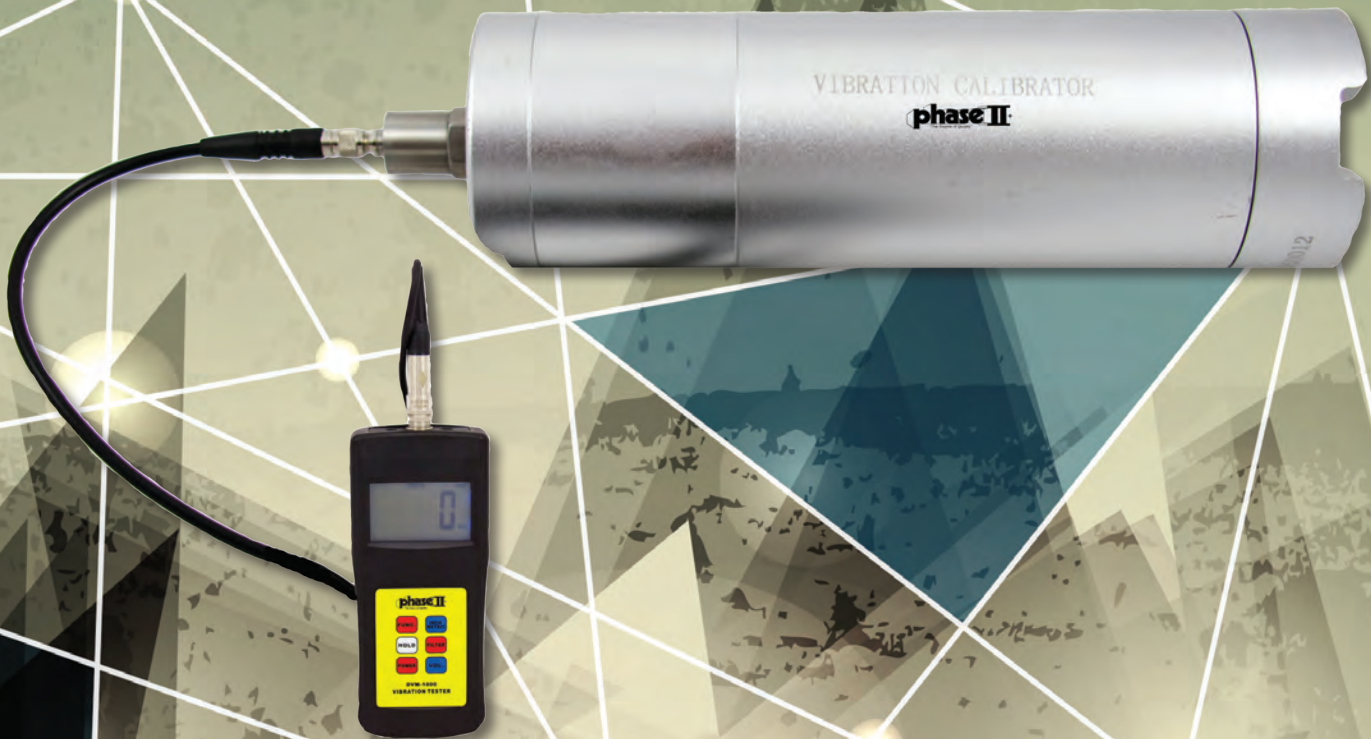
Acceleration	Peak Value: 0.1 - 400 m/s or 0.3-1312 ft/s ² ; 0.0-40g	Frequency Range: 10Hz-10KHz
Velocity(RMS)	RMS: 0.1-400 (mm/s) or 0.004 -16.0 inch/s	Frequency Range: 10Hz-1KHz
Displacement	peak to peak: 0.001-4.0mm or 0.04-160mil 10Hz-1KHz	Frequency Range: 10Hz-500Hz
Accuracy	+/-5%N+0.2	
Operating Temp	32-120°F / <95%RH	
Power	2-AA Batteries	
Dimensions	130 x 70 x 30mm	
Weight	305g	

DVM Includes:

- 1-Powerful Magnet
- 1-3-Axis Accelerometer
- 1-Stinger Probe (point)
- 1-Stinger Probe (Ball)
- Operation Manual
- Carry Case

DVM-2000 Digital Vibration Tester

Vibration Calibrator 77



Operating Frequency	159.2Hz +/-0.5%
Acceleration Output	10M/s ² (RMS) +/-3%
Velocity Output	10µm (RMS) +/-4%
Displacement Output	10µm (RMS) +/-4%
Transverse Output	<5%
Distortion	<3%
Max Load	150g
Operating Temp	15°F - 105°F
Ramp up Time	<3 Seconds
Internal Battery	1-9V 6F22
Size	56mm x 200mm
Weight	2lbs

Features:

- Operates at 159.2 Hz
- 10mm/s RMS velocity output
- Drives vibration sensors up to 150g

DVM-1600

Applications:

The DVM-1600 vibration calibrator is an integrated shaker type system that is designed to test accelerometers, vibration monitoring equipment and recording systems. The DVM-1600 provides a known and controlled RMS vibration for verification of accelerometers weighing up to 150g.



"The Source of Quality"

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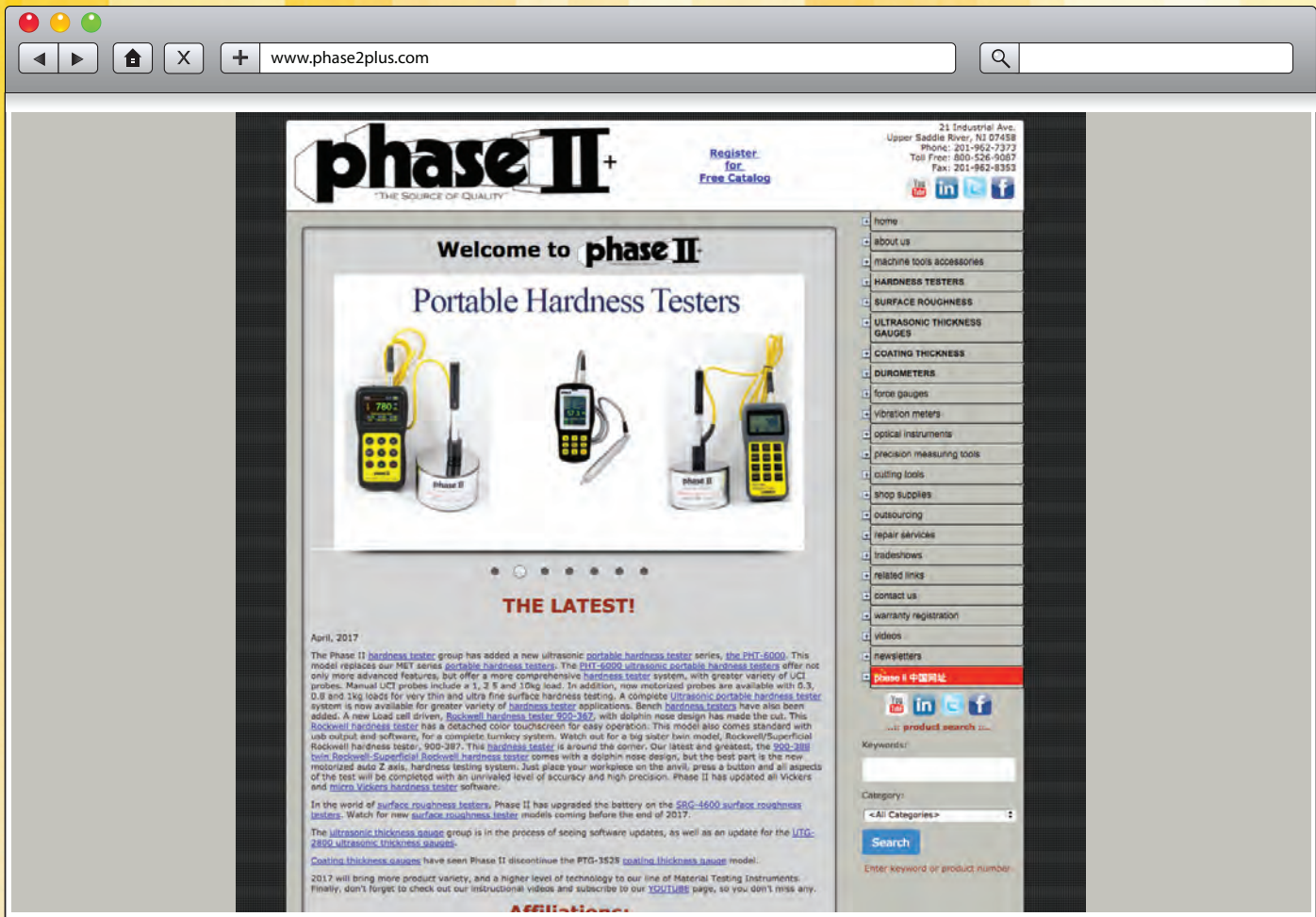
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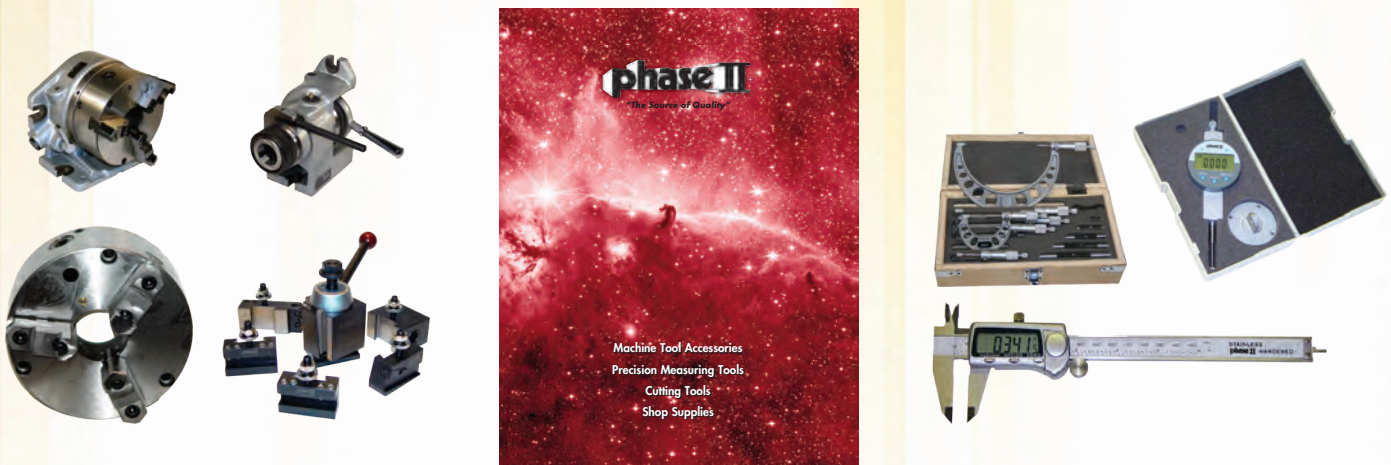
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Please be sure to visit our constantly updated website for the latest products and information from Phase II. Here you will find our full line broken down into easy to navigate groups where you can access product specifications, pictures, instructional videos and more.

We also offer informational links to ASTM, NIST as well as user friendly resources for each category.



Don't forget to check out our machine tool accessories and measuring instruments!



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Aero Turbine	Con Edison Power	Hughes Christensen	NC State University	TESLA
Aerospace Coatings International	Conoco	Idaho Armored Vaults	New York University	Thermo-Fisher Scientific
Aerospatiale Hemingford	Coors Tek	Ideal Steel	Nissan	Thornapple Steel
Air Liquide	Corning	Iljin USA	Nissin Brake	Thyssen Krupp
Airflow Research	Cummins	Ingalls Shipbuilding	Northlake Steel	Timken
AKG	Curtiss Wright	Ingersoll Rand	Novartis Pharmaceuticals	Toronto Transit
Akebono Brake Co	Dana Corp	Innovation Medical	NTN-Bower Corp	Toyo Seat
Alcoa	DB Cylinder Heads	Intel Corp	Nucor Steel	Toyota
Alcoa Howmet Castings	Detroit Diesel	Intercomp	Nuweld	Trelleborg
Alcoa Thermatech Coatings	Dresser Rand	International Crankshaft	NYC Transit	Trescal
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American Racing	Eaton	John Deere	Parke Hannifin	Tyco
American Roller Bearing	Electric Boat	Johns Hopkins	Penn State University	U.S. Air Force
Amtrak	Elkay Mfg	Johnson & Johnson	Penske Jasper Engines	U.S. Army
Anderson Brothers	Evergreen Airlines	Johnson Controls	Philips Oil	U.S. EPA
Construction	Everham Engines	Kaiser Aluminum	Port Authority of NY/NJ	U.S. Geological Survey
Arcelor Mittal	Exporion Photonics	KB Racing	Pratt & Whitney	U.S. Marine Corps.
Archer Daniels Midland	Federal Signal	Kellogg	Praxair, Inc.	U.S. Navy
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Arias Pistons	Florida Institute of Technology	Keyspan Energy	Proctor & Gamble	U.S. Tsubaka
Arizona State University	Flowserve	Keystone Automotive	Purdue Univ.	United Launch Alliance
Array Technologies	Fluor Corp	Kimball Electronic Lab	Quantum Precision	Universal Steel
Arrow Engine Co.	Ford Motor Co.	Klein Tools	Quest Testing Services	Universal Studios Orlando
Atlas Tube	Ford Performance Racing	Kohler	Raybestos Powertrain	University of Arkansas
BAE Systems	Fox Valley Energy	Kone Cranes	Raytheon	University of Maine
Baker Hughes	Franklin Fueling Systems	Krazy Glue	Rcohester Machine	University of Massachusetts
Baldor	Freightliner	L3 Communications	Reactive Nano Technologies	University of Minnesota
BASF	FSU	LG Electronics	Reliance Machine	University of New Zealand
Bechtel	Garmin Intl	Liberty Mutual Insurance	Reliant Energy	University of Texas-Austin
Becton Dickinson	GATX Rail Corp	Lincoln Forge	Rocky Mountain Steel Mill	University of Utah
Bodycote	General Electric (GE)	LMI Aerospace	Roush-Yates Racing	Universoty of Ottawa
Boeing	General Mills	Lockheed Martin	Safety Kleen	US Army Corps of Engineers
Bombardier	General Motors	Los Alamos National Labs	Saint Gobain Abrasives	US Coast Guard
Borg Warner	Genlyte Group	Lufkin Industries	Sandia National Labs	UTC Aerospace
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Braun Electric	Georgia Pacific	Manitowoc Cranes	Sanofi-Aventis	Virginia Tech
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	Hendrick Motorsports	Nanosolar	Taurus Arms	

A stylized world map in shades of blue, centered on the Atlantic Ocean, serves as the background for the entire page. The map is overlaid with a light blue grid.

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The logo for Phase II+ is rendered in a bold, black, sans-serif font. The letters 'p', 'h', 'a', 's', 'e', and 'I' are solid black. The letter 'I' is stylized with a white rectangular cutout in its center. To the right of the 'I' is a plus sign '+'. The logo is set against a background of a circular, brushed metal texture that radiates from a central point, creating a sense of depth and motion. The entire design is framed by a perforated metal border at the top and bottom, with five screws visible on each side of the central circular area.

phase II+

The Source of Quality

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