



# HardyTest® UCI 3000

with „Ultrasonic Contact Impedance“  
Hardness testing up to 30 micron  
with 10, 50 or 100 Newton probe

Our HardyTest® UCI 3000 is especially for very precise hardness testing. With the technique of "Ultrasonic-Contact-Impedance", with a Vickers diamond it can measure even layers up to 30 micron.

### Application

Hardness testing on fine-grained, thin-walled materials and alloys, nitrided and high frequency hardened and chrome plated parts in the power industry, petrochemical industry, in the apparatus, vehicle and mechanical engineering, quality control and in the steel industry.

### Features

- Hardness testing for all ferro magnetic materials and alloys (with exceptions)
- automatic testing process
- even up to 30 micron
- very good accuracy
- suitable for mass testing of work pieces
- Housing is protected against moisture and dust
- low requirements on the mass and thickness of the work piece e.g. on thin wall pipes up to 2 mm thickness
- even in hard to reach areas

### Functions

- all measuring directions without entry of correction values
- the large coloured display of the test results can be enlarged when the display of different parameters is stopped.
- administration and editing of test results, which can be saved in every group
- Evaluation of measuring results in graphic form
- PC connection with USB



#### Standard Probe (145 mm):

- A - 50N
- H - 10N
- C - 100N



#### Special Probe (70 mm):

- K - 50N



#### Special Probe (176 mm):

- AL - 50N



Technical Data	HardyTest® UCI 3000
Hardness units:	HRC, HB, HV, in addition: HRA, HRB, HS
Measuring range:	Rockwell 20 - 70 HRC / Brinell 90 - 460 HB / Vickers 240 - 940 HV
Accuracy:	Rockwell HRC: 1,5 %; Brinell HB: 4 %; Vickers HV: 3 %
Application:	Hardness testing on fine-grained, thin-walled materials and alloys, nitrided and high frequency hardened and chrome plated parts
Material:	all ferromagnetic material (with exceptions)
Coating testing:	ab 30 µm (micron) with special probe 10Newton
Minimum weight of sample:	10 g
Contact:	1 mm, 5mm depth in a blind hole (a bore which does not completely penetrate the workpiece)
Minimum Hardness depth:	little influence of mass and thickness of sample
Impact depth:	no noticable grooves, impact body: cone of diamond with an angle of $\alpha = 136^\circ$ (Vickers indenter equivalent)
Direction of Impact device:	0 - 360°
Language:	Menue/Software/Instructions: german/english
Functions:	1- and 2-point calibration, Auto off, Reset, random test, low energy mode, naming of memory cells, correction of measuring results
Statistics:	adjustable, analysis of measuring results (Standard deviation, limits, average values, graphic illustration, minimum, maximum)
Data memory:	12.900 values, 100 different groups of measuring values
PC Data processing:	USB data cable + Software
Display:	coloured LCD display with adjustable backlight
Power supply:	rechargeable battery, capacity 15 - 20 hours (with backlight)
Environment:	Working temperature: -10°C to +40°C, rel. humidity: ≤90%
Dimensions (L x W x H):	125 x 70 x 40 mm
Weight:	450 g with probe, case: 2,6 kg

#### Standard delivery

- HardyTest® UCI 3000
- Probe A -50N (Height: 145 mm), cable and adapter
- rechargeable Battery and loading device
- USB data cable
- Software CD
- User manual
- Service case

#### Optional

- Special probe H,C,K,AL
- Convex adapter for measurements on pipes with low diameters



# Static Ultrasonic Hardness Tester

## HardyTest UCI1500

It is intended for measuring hardness off metal and alloy articles with Rockwell, Brinell, Vickers. It consists of the dynamic transducer (sensor) and the electronic module. The principle of tester operation is based on determination of frequency change in free oscillation of the indenter (an acoustic resonator with Vickers diamond pyramid) subjected to the constant force of 50N.

### ADVANTAGES:

- measuring hardness of both small and large articles
- measuring hardness of complexly shaped articles, with hard to reach places, in various spatial positions
- convenience and ease of use
- PC-connectable via USB interface
- high measuring performance
- power source discharge indication and display illumination
- graphical display with lighting
- storing 6000 hardness measurements in the non-volatile memory
- supply of reference blocks on request

### TYPICAL OBJECTS FOR MEASUREMENTS:

Case-hardening articles, thin-walled pressure vessels, thinwalled pipelines, turbine rotors, forming rolls, crankshafts, gears, metal-working tools, vehicle parts, rails, railroad car wheels, semi-finished industrial products (castings, sheets), welded joints, etc.

### STANDARD DELIVERY:

- main unit HardyTest UCI 1500
- probe 50N
- software
- USB transfer cable to PC
- battery charger
- operation manual
- carrying case

### OPTIONAL:

- probe 10N
- probe 100N
- probe with long tip



MAIN TECHNICAL PARAMETERS		
Support unit for measuring on pipes and convex spots		
Special probe	10N	
Hardness measurement ranges by scales	Rockwell Scale	20...70 HRC
	Brinell Scale	100 450 HB
	Vickers Scale	240 940 HV
Accuracy	Rockwell Scale HRC	1.5%
	Brinell Scale HB	4.0%
	Vickers Scale HV	3.0%
Number of measurement results stored in memory	6000	
Interface	USB	
Hardness tester power supply	rechargeable battery	
Dimensions unit	150 x 80 x 30 mm	
Weight of electronic module with sensor	0.4 kg	
Category temperature range	-10°...+40°C	

# Hardy Test D100<sup>®</sup>

Portable digital hardness tester



- High accuracy
- Palm size for narrow space
- Built-in impact device
- For all metallic material
- Wide measuring range
- Test in any directions
- Rockwell B&C, Brinell, Vickers, Shore and HL
- Wireless RS232 to PC and Micro-printer
- Complies to ASTM standard

**HardyTest D100** is an integrated handheld metal hardness tester that combines impact device (probe) and processor into one unit.

The size is much shorter than a normal impact device, so **HardyTest D100** can meet not only normal measurement, but can take measurements at narrow space as well.

**HardyTest D100** is suitable for hardness testing of almost all ferrous and non-Ferrous materials.

It can be used for power plant industry, petrochemical field, vehicle machine, air space, machines and so on.

## Measuring method

The measuring principle is defined as “the quotient of the impact body’s rebound and impact velocity, multiplied by 1000”.

An impact body with a Tungsten Carbide test tip is propelled by spring force against the test surface and then rebounded back.

A permanent magnet is contained within the impact body.

There is an electric voltage which is proportional to the velocity of the impact body.

## Specifications

- Display: LCD
- Accuracy:  $\pm 0.6\%$  at HL=800 (HRC0.2)
- Measuring range: 200-960L
- Hardness scale: HL/HRC/HRB/HB/HV/HSD
- Materials: 9 different common materials
- Memory: 99 data can be stored and re-readable
- Wireless RS232 to PC and micro printer
- Impact device: D
- Power on/off: Auto
- Power supply: DC 9V rechargeable battery
- Dimension: 100x60x33 mm
- Weight: 150 g

Material	HL	HRC	HRB	HB	HV	HS
Steel & cast steel		19-68	38-100	80-683	80-1027	32-102
Cold work tool steel		20-67	-	-	80-900	-
Stainless steel		20-62	46-102	80-655	85-800	-
Grey cast iron	174-	-	-	93-334	-	-
Nodular cast iron	960	-	-	130-390	-	-
Cast aluminium alloys		-	-	20-160	-	-
Copper/Zink alloys (brass)		-	13-95	40-173	-	-
Cu/AlCuSn alloys (bronze)		-	-	60-290	-	-
Wrought copper alloys		-	-	45-315	-	-

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## Features

- Rugged and modular design
- Palm sized for narrow space
- High accuracy
- Automatic power on/off
- Recalibration allowed

Support Rings:

On curved surfaces having a radius of under 30 mm, an appropriate support ring is screwed on to the front of the impact device.

## Standard Package

- Base instrument **HardyTest D100**
- Built-in impact device D
- Test block D
- Battery: charger
- Carrying case
- Cleaning brush
- Manual

## Optional Accessories

- Wireless Micro-printer
- Wireless RS232 module
- Data management software
- Special support rings
- **HardyTest D100 L** available



# Portable Hardness Tester

# HardyTest D400®

The Hardness Tester **HardyTest D400** measure by the dynamic measurement principle, in all directions, for all metals with high accuracy and wide amplitude in the measurement range.

- Material identification in storage
- Assembled pieces control
- Hardness variation of large dimension pieces
- Control of pieces in production
- According ASTM standard A-956-96



### Standard Equipment Include

- Electronic Unit D400
- Impact Device D
- Hardness Rockwell C Standard with certificate OA
- Connection cable RS 232
- Transfer Software to P
- Operation Manu
- Transporting Case

### Technical Specifications

**Screen:** Graphic LCD 128 x 64 pixels with backlight

**Backlight modes:** Off-On Automatic  
Large digits for measured value in selected unit (11 mm height)

Always showed the measured value in Leeb units plus the measured value in the selected unit

**Languages:**

English, German, Russian

**Impact device:** Typ D

**Precision :**  $\pm 0,5$  (referred to  $L=800 \pm 4 HL$ ) according ASTM A956-02

**Data logger + Statistics:**

Storage of 2000 data, Date and hour record  
Histogramm viewing of data groups

**Statistic values:**

Average, Minimum, Maximum, Range

**Alarms:**

Minimum and maximum programmable

**Angular corrections:** Manual and Automatic

**Autonomy:** 120 hours (with alkaline batteries without backlight)

**Auto -Off:** Programmable from 4 to 30 minutes

**Data Output:** USB to PC

**Dimensions:** 122 x 65 x 22 mm

**Weight:** 160 g with batteries

**Power supply:** By two alkaline batteries AA

<u>Materials</u>	<u>Hardness Range</u>
Steel	Leeb All 80-650 HB Brinell 80-940 HV Vickers 38-100 HS Shore D 20-68 HRC Rockwell C 30-100 HRB Rockwell B (N/mm <sup>2</sup> o Mpa) Resistance
Grey	Leeb All 90-330 HB Brinell
Bronze	Leeb All 60-290 HB Brinell
Copper	Leeb All 45-135 HB Brinell
Nodular	Leeb All 130-380 HB Brinell
Aluminium	Leeb All 30-160 HB Brinell
Brass	Leeb All 40-173 HB Brinell 13-95 HRB Rockwell B
Steel for tools	Leeb All 60-900 HV Vickers 20-67 HRD Rockwell C
Stainless steel	Leeb All 85-655 HB Brinell 85-800 HV Vickers 20-62 HRC Rockwell C 46-101 HRB Rockwell B



# Digital hardness meter

*with high accuracy*

- *for all metallic materials*
- *large measuring memory*
- *PC-interface*
- *7 types of impact devices*



# Hardy Test D600<sup>®</sup>

The **HardyTest D600®** measures the hardness of a large number of materials in various hardness units. Seven types of impact devices make this possible. It is equipped with a USB/RS232-cable for PC transfer.



# precise and practical

## Measuring Features

- **Wide measuring range** with Leeb hardness testing principle
- **6 hardness units**
- **Large memory capacity** with information about number of group, date, average value, impact device, impact times, material for every measured value
- **Upper and lower limit can be preset.** It will alarm automatically when the measured value exceeds the limit.
- **Test at any angle**, even upside down
- **User calibration function**

## Equipment

- **7 types of impact devices** for specific applications available; **automatic identification** by connection
- **Large LCD-display:** all functions and parameters are displayed + backlight
- **PC-transfer** with cable (both USB and RS232 interface) and software
- Battery capacity display - **100 hours operating time** (without backlight)
- **Auto power off** (after 5 minutes) to save energy

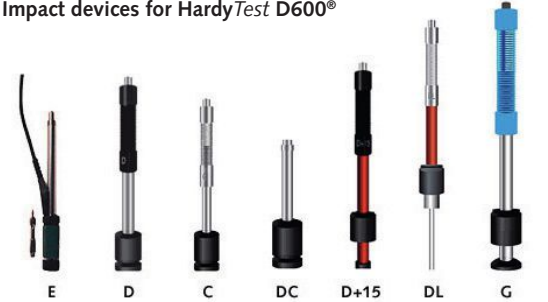
## Main Application

- Measurements on steel, cast steel, cold work tool steel, stainless steel, gray cast iron, nodular cast iron, cast aluminium alloys, brass, bronze and wrought copper alloys
- Measurements on large and small hollows, bearings, heavy parts, permanently assembled parts
- **Defect analysis** of pressure vessels, steam generators, etc.
- **Material identifi** of metal warehouses

## Standard delivery

- |   |                           |
|---|---------------------------|
| - Main unit                             | <b>Optional</b>           |
| - Impact device D                       | - Set of supporting rings |
| - Cleaning brush                        | - Printer                 |
| - Small support ring                    | - Other impact devices    |
| - High value Leeb test block            |                           |
| - Manual                                |                           |
| - Service-case                          |                           |
| - USB/RS232-cable                       |                           |
| - Software HT-50 Data View on USB Stick |                           |

## Impact devices for HardyTest D600®



**Impact device D:** Universal device for most hardness requirements

**Impact device DC:** Ultra-short version; manually loaded on the front; same characteristics as type D; for testing in boreholes, built-in parts, hollow cylindrical parts, etc.; max. 940 HV

**Impact device DL:** With extremely long and fine front piece only for steel and cast steel; for testing in narrow or hard to reach areas; max. 950 HV

**Impact device D+15:** The front part is narrow and the coil is located behind it; same characteristics as type D; only for steel; for hardness testing in slots, grooves, recessed areas, gear flanks, grooves, cavities, tooth flanks, etc.; max. 940 HV

**Impact device C:** Reduced impact energy of about 1/4 of type D; for tempered or surface treated steel, small or sensitive-to-shock parts (minimal imprint is left); max. 1000 HV

**Impact device G:** With large test-tip diameter; impact energy 9 times larger than type D; on steel, gray or nodular cast iron; for large cast parts and forgings or parts with high surface roughness; max. 650 HB (only in Brinell)

**Impact device E:** With a synthetic diamond test tip of approx. 5000 HV; for very hard materials (above 50 HRC / 650 HV) such as carbide, barrels, etc.; max. 1200 HV

## Technical Specifications

Hardness units	HL (Leeb), HB (Brinell), HRB (Rockwell B), HRC (Rockwell C), HV (Vickers), HS (Shore D)
Measuring range	170 - 960 HLD
Measuring direction	360°
Standard impact device	D
Memory size	48-600 groups (relative to number of impact times 1-32)
Statistics	Number of group, date, average value, impact device, impact times, material, measured values
Setting of limits	Acoustic signal by overstepping preset min. und max. limits
Minimum weight of sample	> 5kg solid material; 2-5kg on stable surface; < 2kg with coupling paste on stable surface
Memory function	Manually or automatically
Data transfer	Cable (both USB and RS232-connection) und software
Languages device and manual	English
Display	128 x 64 Dot-Matrix-LCD
Backlight	ON / OFF key
Battery capacity	100 hours (without backlight)
Auto Power Off	After 5 minutes
Power supply	2 x 1,5 Volt-AA-batteries
Relative humidity	≤ 90%
Working temperature	-10°C to +40°C
Weight	380 g (with batteries)
Size	125 x 67 x 30mm

Technical details are subject to change.

Standard Impact Device D	HRB	HRC	HB	HV	HS
Steel, Cast Steel	38-100	20-69	127-651	83-976	32-100
Cold Work Steel	-	20-67	-	80-898	-
Stainless Steel	47-102	-	85-655	85-802	-
Gray Cast Iron	-	-	93-334	-	-
Nodular Cast Iron	-	-	131-387	-	-
Aluminum Alloys	24-85	-	19-164	-	-
Brass	14-95	-	40-173	-	-
Bronze	-	-	60-290	-	-
Copper	-	-	45-315	-	-



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# Digital hardness meter

*with inbuilt printer*

- for all metallic materials
- large measuring memory
- with PC-interface
- inbuilt battery-charger
- for all measuring directions



# Hardy Test D700<sup>®</sup>



The **HardyTest D700®** measures the hardness of a large number of materials in six hardness units. Seven types of impact devices enable the hardness measurement of special test piece forms in different hardness grades. It is equipped with an integrated printer and the opportunity to PC transfer.



# precise and practical

## Features

- **Wide measuring range**
- Available hardness scales: HRB, HRC, HV, HB, HS, HL
- **Large memory capacity**
- Upper and lower limit can be preset. It will alarm automatically when the measured value exceeds the limit.
- **Test at any angle**, even upside down
- **User calibration function**
- 7 types of impact devices for specific applications available; **automatic identify** after connection
- **Integrated printer**
- Large display: all functions and parameters are displayed + backlight
- **PC-transfer** with USB cable and software
- **Built-in charging circuitry**
- Battery capacity display - **150 hours operating time** (without backlight and printing)
- **Auto-Power-Off** to save energy

## Application

- Measurements on **steel, cast steel, cold work tool steel, stainless steel, gray cast iron, nodular cast iron, cast aluminium alloys, brass, bronze and wrought copper alloys**
- **Defect analysis** of pressure vessels, steam generators, etc.
- **Material identification** of metal warehouses

## Standard delivery

- Main unit
- Impact device D
- Cleaning brush
- Small support ring
- Charger cable
- Paper for printing
- Manual
- Service-case
- USB-cable and software

## Optional

- Set of supporting rings
- Other impact devices

## Impact devices for HardyTest D700®



**Impact device D:** Universal device for most hardness requirements

**Impact device DC:** Ultra-short version; manually loaded on the front; same characteristics as type D; for testing in boreholes, built-in parts, hollow cylindrical parts, etc.; max. 940 HV

**Impact device DL:** With extremely long and fine front piece only for steel and cast steel; for testing in narrow or hard to reach areas; max. 950 HV

**Impact device D+15:** The front part is narrow and the coil is located behind it; same characteristics as type D; only for steel; for hardness testing in slots, grooves, recessed areas, gear flanks, grooves, cavities, tooth flanks, etc.; max. 940 HV

**Impact device C:** Reduced impact energy of about 1/4 of type D; for tempered or surface treated steel, small or sensitive-to-shock parts (minimal imprint is left); max. 1000 HV

**Impact device G:** With large test-tip diameter; impact energy 9 times larger than type D; on steel, gray or nodular cast iron; for large cast parts and forgings or parts with high surface roughness; max. 650 HB (only in Brinell)

**Impact device E:** With a synthetic diamond test tip of approx. 5000 HV; for very hard materials (above 50 HRC / 650 HV) such as carbide, barrels, etc.; max. 1200 HV

## Technical Specifications

Hardness units	HL (Leeb), HB (Brinell), HRB (Rockwell B), HRC (Rockwell C), HV (Vickers), HS (Shore D)
Measuring range	170 - 960 HLD
Measuring direction	360°
Standard impact device	D
Memory size	Max. 500 groups (relative to the times of impacts 1-32)
Statistics	Records the number of measurements, date, average value, impact device, material and hardness unit for each measured value.
Setting of limits	Acoustic signal by overstepping preset min. and max. limits
Minimum weight of sample	> 5kg solid material; 2-5kg on stable surface; < 2kg with coupling paste on stable surface
Memory function	Manually or automatically
Data transfer	USB-cable and software
Languages	English and German
Display	128 x 64 Dot-Matrix-LCD
Backlight	Adjustable brightness
Battery capacity	150 hours (without backlight and printing)
Power supply	Battery-pack (6V NI-MH) with integrated charging circuit and charging cable
Battery charging cable	9V / 500mA
Print paper (length x width)	57.5 (± 0,5 mm) x 30 mm
Storage temperature	-30°C to +60°C
Relative humidity	≤ 90%
Working temperature	-10°C to +50°C
Weight	340 g (with batteries)
Size	212 x 80 x 32 mm

Technical details are subject to change.

Standard Impact Device D	HRB	HRC	HB	HV	HS
Steel, Cast Steel	38-100	20-69	127-651	83-976	32-100
Cold Work Steel	-	20-67	-	80-898	-
Stainless Steel	47-102	-	85-655	85-802	-
Gray Cast Iron	-	-	93-334	-	-
Nodular Cast Iron	-	-	131-387	-	-
Aluminum Alloys	24-85	-	19-164	-	-
Brass	14-95	-	40-173	-	-
Bronze	-	-	60-290	-	-
Copper	-	-	45-315	-	-



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# >> HardyTest 1800B/+ with D and DL

## Specifications

- Principle: Leeb hardness measurement
- Impact device: D / DL (Optional)
- Accuracy:  $\pm 2HL$  (or  $0.3\% @ HL=800$ )
- Display: High contrast OLED display
- Hardness scale: HL / HRC / HRB / HB / HV / HS / HRA /  $\sigma_b$
- Measuring range: HL200-960 / HRC19-70 / HRB13-109 / HB20-665 / HV80-940 / HS32-99.5 / HRS30-88 / HRA30-88
- Materials: 10 common metal materials
- Interface: USB/RS232 for printing or charging
- Interface: Bluetooth for printing (optional)
- Memory: 4000 data can be saved in 4 blocks and re-readable
- Recalibration: allowed by user
- Alarm: Up or down limit
- Indicator: Low battery
- Power supply: 3.7V Li-ion rechargeable battery
- Power on/off: Auto
- Operating environment:  $-40 \sim +80^\circ\text{C}$
- Dimension(LxWxD): 148x44x22mm
- Net weight: 110g
- Standard: ASTM A956



## Key Features

- High accuracy:  $\pm 0.3\%$
- Integrated design: combine probe and processor into one unit
- Two-in-one probe: D-DL convertible
- Wide operating environment:  $-40^\circ\text{C} \sim +80^\circ\text{C}$
- Auto turn on & off
- High contrast OLED display: clearing at dark area
- Recalibration allowed by user
- Bluetooth wireless printing (Optional)



## Applications

- Hardness tests on installed machines or steel structures: e.g. on heavy and large work-piece or on permanently installed system parts.
- Rapid testing of multiple measuring areas for examination of hardness variations over larger regions.
- Measuring hardness for produced parts at production line.
- Identifying metallic material stored in a warehouse.
- Ineffectiveness analysis of permanent parts, pressure -vessel, turbo generator.



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