

UNIVERSAL HARDNESS TESTERS

UNIVERSAL HARDNESS TESTING

Universal hardness testers are in fact hybrid instruments allowing the user to make Rockwell, Vickers and Brinell hardness tests according to the applicable EN-ISO and ASTM standards, with one single machine.

Universal hardness testers do not convert hardness values but apply tests according to standard procedures.

While most hardness testers in particular measure only one kind of scale; either Rockwell or Vickers or Brinell, the Universal testers cover a wide range of testloads and measurement procedures.

While traditional Universal hardness testers were complex mechanical structures, built of many parts and complicated weight stacks, newer generations based on load cell technology and closed loop force feedback systems have taken away most of the complexity of earlier models.

Nowadays, Universal hardness testers offer the user the comfort of having one single tester covering all scales. The advantage is obvious. While Universal hardness testers are often a more expensive asset, money can be saved on maintenance, after sales service and calibration. Due to technology of the load application system, closed loop Universal hardness testers offer a wide range of testloads generally superceeding single scale testers traditionally having dead weight load application systems.

INNOVATEST® manufactures a vast range of Universal hardness testers. Regardless of your budget, there is a tester for each application. Starting from simple traditional dead weight series like the 700M, or the simple to operate but very advanced 703 and 704 models to state-of-the-art machines like the new NEMESIS 9000™ series.

Due to the size of the range we present on this page and following pages a more detailed overview. Don't hesitate to ask our sales department for your particular requirement or advice on the best choice for your budget.

700M

Rockwell, Vickers, Brinell

Traditional dead weight hardness tester with an analogue Rockwell scale and analogue microscope for indent measuring. Ideal for educational purpose or general metal working workshops.

Limited test loads varying between 31.25kgf and 187.5kgf.

NEXUS 700 SERIES

Rockwell, Vickers, Knoop, Brinell, HVT, HBT

Load cell, closed loop, force feedback system. Advanced digital measurement system, digital display readings, memory and conversion to other hardness scales. Ideal for a very large range of smaller parts and components. Extreme suitable for educational purposes, research institutes and light industry. Offering a wide range (18) of test loads starting at 2kgf to 187.5kgf

NEXUS 7000 SERIES

Rockwell, Vickers, Knoop, Brinell, HVT, HBT

Load cell, closed loop, force feedback system. Advanced digital system, digital readings, memory and conversion to other hardness scales. Mat screen for Vickers and Brinell indents. Large workpiece accommodation that can be extended on request. Wide range of test loads starting at 1kgf to 250kgf.

NEMESIS 9000™ SERIES

Rockwell, Vickers, Knoop, Brinell, HVT, HBT

Load cell, closed loop, force feedback system. State of the art hardness testing machine. Built-in Industrial PC for video indent measuring system. Advanced firmware, automatic measurement, descending testhead, turret with 3 indenter positions and 3 objectives, optical ZOOM system, flexible working height, long working distance objectives, superior test range, depending on model allowing 500gram to 3000kgf force application.

UNIVERSAL HARDNESS TESTERS



UNIVERSAL HARDNESS TESTERS

NEXUS 700 SERIES

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NEXUS 702A

ANALOGUE EXTERNAL MICROSCOPE

Rockwell, Superficial Rockwell & Brinell

- Load cell, closed loop system
- Test loads 2kgf - 187.5kgf
- External microscope with analogue scale for indentation measurement
- Built-in hardness calculator
- Digital full color OLED display shows all hardness values, statistics and tester settings. Advanced functions
- Conversion to Rockwell, Superficial Rockwell, Vickers, Brinell scales

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NEXUS 703A

ANALOGUE BUILT-ON MICROSCOPE

Rockwell, Superficial Rockwell, Brinell & Vickers

- Load cell, closed loop system
- Test loads 2kgf - 187.5kgf
- Built-on microscope with analogue scale for indentation measurement
- Built-in hardness calculator
- Digital full color OLED display shows all hardness values, statistics and tester settings. Advanced functions
- Conversion to Rockwell, Superficial Rockwell, Vickers, Brinell scales

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NEXUS 704A

ANALOGUE BUILT-ON MICROSCOPE

Rockwell, Superficial Rockwell, Brinell, Vickers, HVT & HBT

- Load cell, closed loop system
- Test loads 2kgf - 187.5kgf
- Built-on microscope with analogue scale for indentation measurement
- Built-in hardness calculator
- Digital full color OLED display shows all hardness values, statistics and tester settings. Advanced functions
- Conversion to Rockwell, Superficial Rockwell, Vickers, Brinell scales

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NEXUS 703D

DIGITAL MICROSCOPE

Rockwell, Superficial Rockwell, Brinell & Vickers

- Load cell, closed loop system
- Test loads 2kgf - 187.5kgf
- Built-on digital microscope for automatic indentation measurement
- Digital full color OLED display shows all hardness values, statistics and tester settings. Advanced functions
- Conversion to Rockwell, Superficial Rockwell, Vickers, Brinell scales

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NEXUS 704D

DIGITAL MICROSCOPE

Rockwell, Superficial Rockwell, Brinell, Vickers, HVT & HBT

- Load cell, closed loop system
- Test loads 2kgf - 187.5kgf
- Built-on digital microscope for automatic indentation measurement
- Digital full color OLED display shows all hardness values, statistics and tester settings. Advanced functions
- Conversion to Rockwell, Superficial Rockwell, Vickers, Brinell scales

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NEXUS 700

CUSTOMIZED

NEXUS 700 Can be configured according to your request

- Special anvils
- Special testing tables or stages
- Knoop scale (optional)
- Custom scales

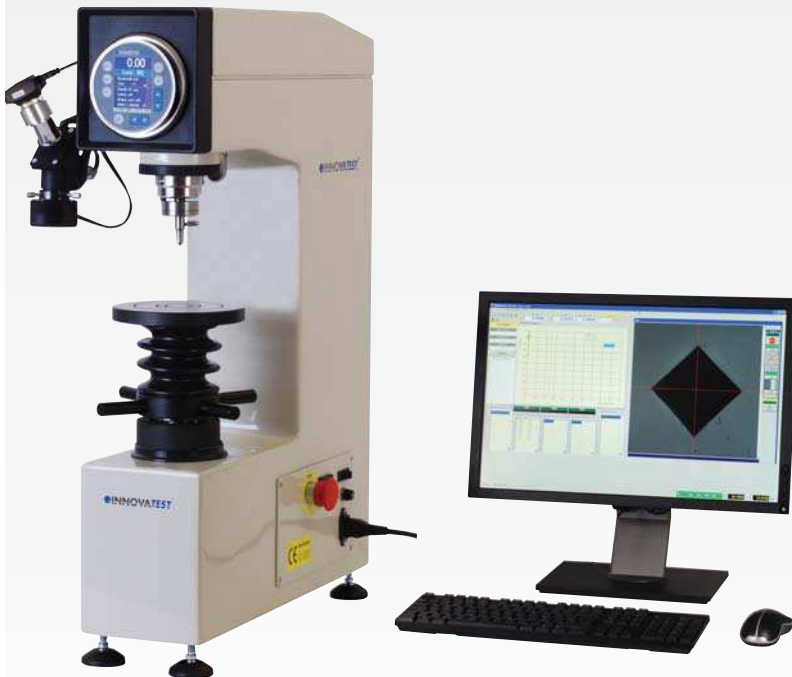


NEXUS 703 INV1

UNIVERSAL SYSTEM WITH VIDEO MEASURING SYSTEM

Rockwell, Superficial Rockwell, Brinell, Vickers & Knoop

- Load cell, closed loop system
- Test loads 2kgf - 187.5kgf
- Vision indent measuring system with advanced capabilities Manual measurement of the indent on the LCD screen Case Hardness Depth, Store, file, handle images and data on the haddisk
- Digital full color OLED display shows all hardness values, statistics and tester settings. Advanced functions
- Conversion to Rockwell, Superficial Rockwell, Vickers, Brinell scales
- Indent measurement optional



NEXUS 704 INV1

UNIVERSAL SYSTEM WITH VIDEO MEASURING SYSTEM

Rockwell, Superficial Rockwell, Brinell, Vickers, Knoop & HVT, HBT, HB

- Load cell, closed loop system
- Test loads 2kgf - 187.5kgf
- Vision indent measuring system with advanced capabilities Manual measurement of the indent on the LCD screen Case Hardness Depth, Store, file, handle images and data on the haddisk
- Digital full color OLED display shows all hardness values, statistics and tester settings. Advanced functions
- Conversion to Rockwell, Superficial Rockwell, Vickers, Brinell scales
- Indent measurement optional



NEXUS 7000
1KGF TO 250KGF

Rockwell, Superficial Rockwell, Brinell, Vickers & HVT, HBT

- Load cell, force feedback, closed loop system
- Test loads 1kgf-250kgf
- Complies to all applicable EN/ISO and ASTM standards
- Optical system high precision optical path, mat screen diameter 135mm
- Shape correction for curved surfaces
- High accuracy depth measuring system (Rockwell, HBT, HVT)
- Large LCD display shows measured values, online statistics, memory overview, tester settings
- User-friendly, low training requirements
- Possibility to store 20 batch files with 50 measuring results
- Direct printer and/or PC connections via RS-232 and USB-2
- Large workpiece accommodation (H=300mm)



NEXUS 7000 XL
1KGF TO 250KGF

Rockwell, Superficial Rockwell, Brinell, Vickers & HVT, HBT

- Load cell, force feedback, closed loop system
- Test loads 1kgf-250kgf
- Complies to all applicable EN/ISO and ASTM standards
- Optical system high precision optical path, screen diameter 135mm
- Shape correction values for curved surfaces
- High accuracy depth measuring system (Rockwell, HBT, HVT)
- Large LCD display shows measured values, online statistics, memory overview, tester settings
- User-friendly, low training requirements
- Possibility to store 20 batch files with 50 measuring results
- Direct printer and/or PC connections via RS-232 and USB-2
- Extra large workpiece accommodation (H=450mm)



NEMESIS 9000™ SERIES
0.5KGF TO 3000KGF

Rockwell, Superficial Rockwell, Brinell, Vickers & HVT, HBT

- Load cell, force feedback, closed loop system
- Test load settings from 500gf to 3000kgf
- IMPRESSIONS™ manual & automatic video indent measuring system
- High resolution indent image ZOOM system
- Turret with 6 positions, 3 indentors, 3 objectives
- Built-in industrial PC
- Large 15" industrial touch screen with easy to use interface
- Complies to all applicable EN/ISO and ASTM standards
- Large database for hardness conversion values, converts to any hardness scale and any material.
- High accuracy depth measuring system
- Possibility to store 10,000 batch files with each 199 measurements
- RS-232, video out, USB-2, LAN connections
- Built-in driver pack for X-Y or jominy stages
- Specimen accommodation; maximum test height 300mm, maximum depth 220mm (from the center)



NEMESIS 9000™ XL SERIES
0.5KGF TO 3000KGF

Rockwell, Superficial Rockwell, Brinell, Vickers & HVT, HBT

- Load cell, force feedback, closed loop system
- Test load settings from 500gf to 3000kgf
- IMPRESSIONS™ manual & automatic video indent measuring system
- High resolution indent image ZOOM system
- Turret with 6 positions, 3 indentors, 3 objectives
- Built-in industrial PC
- Large 15" industrial touch screen with easy to use interface
- Complies to all applicable EN/ISO and ASTM standards
- Large database for hardness conversion values, converts to any hardness scale and any material.
- High accuracy depth measuring system
- Possibility to store 10,000 batch files with each 199 measurements
- RS-232, video out, USB-2, LAN connections
- Built-in driver pack for X-Y or jominy stages
- Specimen accommodation; maximum test height 450mm, maximum depth 220mm (from the center)



700M
ANALOGUE, DEAD WEIGHT

FEATURES

Rockwell, Vickers, Brinell, traditional dead weight hardness tester with an analogue Rockwell scale and analogue microscope readings. Ideal for educational purpose or general metal working workshops. Limited test loads ranging between 31.25kgf and 187.5kgf.

- Dead-weight universal hardness tester with rigid design
- Rockwell, Brinell and Vickers testing procedures combined in one tester
- Sliding table between indenter and measuring microscope
- Magnification by 3 objective lenses giving up to 150x magnification (optional)
- Conforms to DIN-EN-ISO 6506, 6507, 6508 and ASTM
- Simple test cycle by operation lever
- Elevating spindle with precision guide bush, high precision bearings to eliminate back-lash from the system



STANDARD DELIVERY

- Objectives for 37.5x and 75x magnification
- Sliding testing table
- V-anvil $\varnothing 40\text{mm}$ and $\varnothing 60\text{mm}$
- Flat anvil $\varnothing 60\text{mm}$
- Testing table $\varnothing 160\text{mm}$
- Hardness test block $\pm 450\text{HV}$
- Hardness test block $\pm 200\text{HB}$
- Hardness test block $\pm 60\text{HRC}$
- Hardness test block $\pm 30\text{HRC}$
- Hardness test block $\pm 85\text{HRB}$
- Rockwell Diamond cone 120°
- Rockwell ball indentors $1/16''$
- Brinell balls indentors 1mm, 2.5mm, 5mm
- Vickers diamond cone 136°
- Fuse 7A (2 pcs)
- Spare light bulb 6V/15W (2 pcs)
- External light source for improved Brinell indent viewing
- Power cable
- INNOVATEST® certificate
- Installation and user manual

TECHNICAL SPECIFICATIONS

Hardness parameters	Rockwell, Brinell, Vickers	
Optics	Eyepiece magnification 15x	
Objectives for	2.5x for 37.5x magnification, 5x for 75x magnification and 10x for 150x magnification (optional)	
Standards	Conforms to DIN-EN-ISO 6506, 6507, 6508 and ASTM	
Test loads	6 Test Loads Selectable	
Test load type	Dead weight via load selector	
Test cycle	Manually operated	
Test loads	Rockwell	60 - 100 - 150kg
	Brinell	31.25 - 62.5 - 187.5kg
	Vickers	30 - 100kg
Indenter types	Rockwell	Diamond cone 120° , Balls $1/16''$
	Brinell	Balls 1mm - 2.5mm - 5mm
	Vickers	Diamond cone 136°
Load duration	Conforms to standards	
Data output	Non	
Specimen accommodation	Maximum test height 180mm, Maximum depth 200mm (from the center)	
Specimen access	External surfaces, Cylindrical surfaces down to 3mm diameter	
Power supply	220V / 50Hz	
Machine dimensions	560mm x 260mm x 760mm (WxDxH)	
Machine weight	90kg	

OPTIONAL ACCESSORIES

- Objective for 150x magnification
- Dual filar microscope
- LED ring light
- Certified indentors & balls
- Reference hardness blocks



ORDER DETAILS

700M Analogue, universal hardness tester



NEXUS 700A
ANALOGUE MICROSCOPE



NEXUS 700D
DIGITAL MICROSCOPE

FEATURES

Rockwell, Vickers, Knoop, Brinell, HVT, HBT Load cell, closed loop, force feedback universal hardness tester. Advanced digital measurement system, digital display readings, memory and conversion to other hardness scales. Ideal for a very large range of smaller parts and components. Extremely suitable for educational purposes, research institutes and light industry. Offering a wide range of test loads starting at 2kgf to 187.5kgf.

- Load cell, force feedback, closed loop system
- Load range 2 up to 187.5kgf
- Complies to all applicable EN/ISO and ASTM standards
- Shape correction values for curved surfaces
- High-quality depth measuring system (Rockwell, HBT, HVT)
- Very user-friendly, low training requirements
- Possibility to store 49 batch files with statistic results
- Direct printer and/or PC connections via USB-2

Suitable to determine the hardness of a wide variety of metal and plastic parts.

TECHNICAL SPECIFICATIONS

Hardness scales	Brinell, Vickers, Rockwell (HVT and HBT)
Load application	Load cell, force feed back, closed loop system
Load range	2kgf to 187.5kgf
Optical system	Analogue (A) or electronic (D) digital microscope with bright LED illumination
Eyepiece	15x magnification (10x optional)
Objectives	Interchangeable 2.5x, 5x and 10x magnification
Scale resolution	0.001mm (1 micron)
Display	Full color OLED display, testing results, statistics, built-in hardness calculator, etc.
Standards	Complies to EN/ISO and ASTM standards
Test loads	2, 2.5, 3, 5, 10, 15, 15.625, 20, 30, 31.25, 45, 50, 60, 62.5, 100, 125, 150, 187.5
Vickers test range	HV 2, 3, 5, 10, 20, 30, 50, 100, 120; HVT 50, 100kgf
Brinell test range	HB1/2.5, 5, 10, 31.25kgf; HB2.5/6.25, 15.625, 31.25, 62.5, 187.5kgf; HB5/25, 62.5, 125kgf; HB10/100kgf; HBT2.5/62.5, 187.5kgf
Rockwell test scales	A, B, C, D, E, F, G, H, K, L, M, P, R, S, V, 15N, 30N, 45N, 15T, 30T, 45T, 15W, 30W, 45W, 15X, 30X, 45X, 15Y, 30Y, 45Y
Test cycles	Automatic, Load, Dwell, Unload
Indentors	Brinell / Balls 1 - 2.5 - 5 - 10mm; Vickers Diamond 136°; Rockwell Diamond Cone 120°; Rockwell balls 1/16", 1/8", 1/4", 1/2"; Some are optional
Force control	1- 99 seconds
Data output	USB-2, RS-232
Specimen accommodation	Max. height: 170mm Max. throat: 165mm

ORDER DETAILS

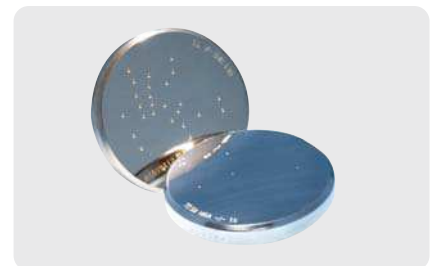
- 702A** Rockwell, Superficial Rockwell, Brinell
- 703A** Rockwell, Superficial Rockwell, Vickers, Brinell
- 704A** Rockwell, Superficial Rockwell, Vickers, Brinell, HVT & HBT
- 703D** See 703A, with digital built-on microscope
- 704D** See 704A, with digital built-on microscope

STANDARD DELIVERY

- Objectives for 37.5x, 75x and 150x magnification
- Rockwell diamond cone 120°
- Rockwell ball indentor 1/16"
- Brinell balls indentors 1mm, 2.5mm, 5mm, 10mm
- Vickers diamond cone 136°
- Sliding testing table
- V-anvil ø40mm and ø60mm
- Flat anvil ø60mm
- Testing table ø160mm
- Hardness test block ±450HV
- Hardness test block ±200HB
- Hardness test block ±60HRC
- Hardness test block ±30HRC
- Hardness test block ±85HRB
- Fuse 7A (2 pcs)
- Spare light bulb 6V/15W (2 pcs)
- External lamp for Brinell measurements
- Power cable
- INNOVATEST® certificate
- Installation and user manual

OPTIONAL ACCESSORIES

- LED ring light for microscope
- Certified indentors
- Reference hardness blocks
- Eyepiece 10x
- Long Vickers indentor
- Custom testing tables
- Precision vices, V-blocks and special clamps
- Software solutions for advanced applications




NEXUS 704 INV1

FEATURES

Rockwell, Vickers, Knoop, Brinell, HVT, HBT Load cell, closed loop, force feedback universal hardness tester. Advanced digital measurement system, digital display readings, memory and conversion to other hardness scales. Innovaview INV-1 PC based high resolution indent viewing system.

Ideal for a very large range of smaller parts and components. Extremely suitable for educational purposes, research institutes and light industry. Offering a wide range of test loads starting at 2kgf to 187.5kgf.

- Load cell, force feedback, closed loop system
- Load range 2 up to 187.5kgf
- Complies to all applicable EN/ISO and ASTM standards
- Shape correction values for curved surfaces
- High-quality depth measuring system (Rockwell, HBT, HVT)
- Very user-friendly, low training requirements
- Rockwell readings; possibility to store 19 batch files with statistic results
- Direct printer and/or PC connections via USB-2

Suitable to determine the hardness of a wide variety of metal and plastic parts.

TECHNICAL SPECIFICATIONS

Hardness scales	Brinell, Vickers, Rockwell (HVT and HBT)
Load application	Load cell, force feed back, closed loop system
Load range	2kgf to 187.5kgf
Optical system	High resolution CCD USB camera
Eyepiece	15x magnification (10x optional)
Objectives	Interchangeable 2.5x, 5x and 10x magnification
Scale resolution	0.001mm (1 micron)
Display	Full color OLED display, testing results, statistics, built-in hardness calculator, etc.
Standards	Complies to EN/ISO and ASTM standards
Test loads	2, 2.5, 3, 5, 10, 15, 15.625, 20, 30, 31.25, 45, 50, 60, 62.5, 100, 125, 150, 187.5
Vickers test range	HV 2, 3, 5, 10, 20, 30, 50, 100, 120; HVT 50, 100kgf
Brinell test range	HB1/2.5, 5, 10, 31.25kgf; HB2.5/6.25, 15.625, 31.25, 62.5, 187.5kgf; HB5/25, 62.5, 125kgf; HB10/100kgf; HBT2.5/62.5, 187.5kgf
Rockwell test scales	A, B, C, D, E, F, G, H, K, L, M, P, R, S, V, 15N, 30N, 45N, 15T, 30T, 45T, 15W, 30W, 45W, 15X, 30X, 45X, 15Y, 30Y, 45Y
Test cycles	Automatic, Load, Dwell, Unload
Indentors	Brinell / Balls 1 - 2.5 - 5 - 10mm; Vickers Diamond 136°; Rockwell Diamond Cone 120°; Rockwell balls 1/16", 1/8", 1/4", 1/2"; Some are optional
Force control	1- 99 seconds
Data output	USB-2, RS-232
Specimen accommodation	Max. height: 170mm Max. throat: 165mm

ORDER DETAILS

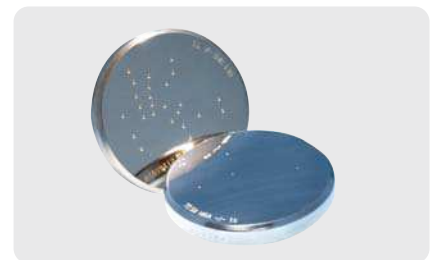
- 703 INV1** Rockwell, Superficial Rockwell, Vickers, Brinell
704 INV1 Rockwell, Superficial Rockwell, Vickers, Brinell, HVT, HBT

STANDARD DELIVERY

- Objectives for 37.5x, 75x and 150x magnification
- Rockwell diamond cone 120°
- Rockwell ball indentor 1/16"
- Brinell balls indentors 1mm, 2.5mm, 5mm, 10mm
- Vickers diamond cone 136°
- Sliding testing table
- V-anvil ø40mm and ø60mm
- Flat anvil ø60mm
- Testing table ø160mm
- Hardness test block ±450HV
- Hardness test block ±200HB
- Hardness test block ±60HRC
- Hardness test block ±30HRC
- Hardness test block ±85HRB
- Fuse 7A (2 pcs)
- Spare light bulb 6V/15W (2 pcs)
- External lamp for Brinell measurements
- Power cable
- INNOVATEST® certificate
- Installation and user manual

OPTIONAL ACCESSORIES

- LED ring light for microscope
- Certified indentors
- Reference hardness blocks
- Eyepiece 10x
- Long Vickers indentor
- Custom testing tables
- Precision vices, V-blocks and special clamps
- Software solutions for advanced applications





NEXUS 7000
DIGITAL, MAT SCREEN



NEXUS 7000XL
DIGITAL MAT SCREEN, LARGE FRAME

FEATURES

Rockwell, Vickers, Knoop, Brinell, HVT, HBT Load cell, closed loop, force feedback system. Advanced digital system, digital readings, memory and conversion to other hardness scales. Mat screen for Vickers and Brinell indents. Large workpiece accommodation in the range of test loads starting at 1kgf to 250kgf.

- Load cell, force feedback, closed loop system
- Wide test load range up to 250kgf
- Complies to all applicable EN/ISO and ASTM standards
- Shape correction values for curved surfaces
- High-quality depth measuring system (Rockwell, HBT, HVT)
- Very user-friendly, low training requirements
- Possibility to store 20 batch files with 50 measuring results each
- Direct printer and/or PC connections via RS-232 and USB-2

Suitable to determine the hardness of castings and forgings, meets a wide variety of applications within the automotive and aerospace industry

TECHNICAL SPECIFICATIONS

Hardness scales	Brinell, Vickers, Rockwell
Load application	Load cell, force feed back, closed loop system
Load range	1 - 250kgf
Optical system	High precision optical path, screen diameter 135mm
Objectives	Interchangeable 20x, 44x, 70x, 140x magnification
Scale Resolution	0.001mm (1 micron)
Display	Full function LCD screen, testing results, statistics, built-in hardness calculator, etc.
Standards	Complies to all applicable EN/ISO and ASTM standards
Test loads	(0.5*) 1, 2, 2.5, 3, 5, 10, 15, 15.625, 20, 30, 31.25, 45, 50, 60, 62.5, 100, 125, 150, 187.5, 250kgf (*Optional)
Vickers test range	HV (0.5*), 1, 2, 3, 5, 10, 20, 30, 50, 100; HVT 50, 100kgf (*Optional)
Brinell test range	HB1/1, 2.5, 5, 10, 30kgf; HB2.5/6.25, 15.625, 31.25, 62.5, 187.5kgf; HB5/ 25, 62.5, 125, 250kgf; HB10/ 100, 250kgf; HBT2.5/62.5, 187.5kgf; HBT5/250kgf
Rockwell test scales	A, B, C, D, E, F, G, H, K, L, M, P, R, S, V, Bm, Fm, Ralpha, 15N, 30N, 45N, 15T, 30T, 45T, 15W, 30W, 45W, 15X, 30X, 45X, 15Y, 30Y, 45Y
Test cycles	Automatic & Manual
Indentors	Brinell / Balls 1 - 2.5 - 5 - 10mm; Vickers Diamond 136°; Rockwell Diamond Cone 120°; Rockwell balls 1/16", 1/8", 1/4", 1/2"; Some are optional
Force control	2- 99 seconds
Data Output	RS-232 Serial Interface (printer/PC), USB
Specimen accommodation	TYPE A: Max. height: 300mm (standard) Max. throat: 150mm (standard) TYPE B: Max. height: 450mm Max. throat: 150mm
Cylindrical Surfaces	Starting at 3mm diameter
Machine dimensions	TYPE A: 250mm x 567mm x 1030mm TYPE B: 250mm x 567mm x 1180mm
Machine weight	TYPE A: 201kg, TYPE B: 212kg
Power Supply	220V / 50Hz other voltages and/or frequencies on request
Guarantee	2 years limited guarantee

ORDER DETAILS

7000 Universal hardness tester, standard

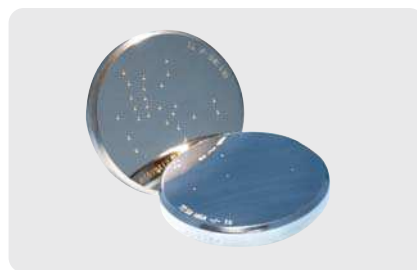
7000XL Universal hardness tester, extended work height

STANDARD DELIVERY

- Diamond Rockwell indenter
- Vickers indenter
- Brinell indenter 2.5mm
- Hardness test block HRA
- Hardness test block HRC
- Hardness test block HRB
- Hardness test block HV30
- Hardness test block HB2.5/187.5
- Objective for 70x magnification
- Objective for 140x magnification
- Clamping protection nose
- Testing table ø80mm
- Installation & user manual
- Calibration certificate
- Toolset

OPTIONAL ACCESSORIES

- Objectives for 10x, 20x, 44x magnification
- Testing table ø150mm
- Testing table ø235mm
- V-Anvil ø80mm
- V-Anvil ø120mm
- Certified indentors & hardness test blocks
- Long Vickers indenter
- Other testing tables and XY-stages
- Precision vices, V-blocks and special clamps
- Software solutions for advanced applications





• Load cell, closed loop, linear force actuator, fixed workpiece position

• Flexible modular design

• Force configuration for maximum 250kgf, 750kgf or 3000kgf

High performance PC, Windows 7 driven operating system with refined algorithms for automatic image measuring system

• 15" high resolution industrial touch-screen

6 Positions modular motorized turret, 5 Mp built-in camera, Optional overview camera

LED illumination, LED ringlight

Microscope quality optical system with long working distance objectives

• ABS shockproof machinecovers, available in multi-colors

NEMESIS 9000™ SERIES
0.5KGF TO 3000KGF, 6 POSITION MOTORIZED TURRET

UNIVERSAL HARDNESS TESTERS

NEMESIS 9000™ SERIES

NEMESIS 9000™ Series, represents the latest top of the range development on universal hardness testing by Innovatest. Modern design, innovated technology, multi purpose hardness testing instrument, based on the application of mechatronic components and high resolution video machine vision systems. A superior level of precision combined with High Definition imaging creates an almost unlimited field of applications.

The NEMESIS 9000™ Series represents universal hardness testing, in the most versatile meaning of Universal. Aircraft engine parts, automobile parts, production lines, general quality assurance and laboratory use, are all fields covered by the NEMESIS 9000™ Series.

Manual operation or full scale automation to the highest possible level are both standard on NEMESIS.

NEMESIS 9000™, Load Cell, Closed loop, Force feedback system, to give what is due, in a modern way, with unlimited flexibility, suitable for the following:

OPTICAL HARDNESS TESTING METHODS:

- Vickers (HV), EN ISO 6507, ASTM E 92
- Knoop (HK) ISO 4545, 4546
- Brinell (HB) EN ISO 6506, ASTM E 10

DEPTH MEASURING HARDNESS TESTING METHODS:

- Rockwell (HR) EN ISO 6508, ASTM E 18
- Vickers depth measurement HVT VDI/VDE 2616-1
- Brinell depth measurement HBT VDI/VDE 2616-1
- Ball indentation hardness (H) (ISO 2039-1) (plastics)

FEATURES

- Rockwell, Superficial Rockwell, Vickers, Knoop, Brinell, Ball indentation, HVT and HBT scales
- Superior range of testloads/force application ranging from 500gf to 3000kgf (over 3 models)
- Fixed workpiece position (no spindle)
- Descending test head with automatic workpiece detection
- Free definable, manual or motorized 6 position turret for objectives and indentors at choice
- High Definition INNOVAZOOM™ optical system for images of 0.7x to 1000x magnification
- PC based INNOVATEST IMPRESSIONS™ hardness testing firmware and database file system, standard
- Large, adjustable 15" industrial touch screen (or mouse with normal 22" LCD screen at choice)
- Automatic or manual focus, manual or fully automatic indent measurement, standard
- Built-in hard disk offers nearly endless file storing, standard
- LAN, WLAN, USB-2, RS-232, Printer and DVI connectivity, standard
- On board built-in driver for (optional) motorized X-Y stage, standard
- Free definable test patterns case depth, traverse, free style, etc., optional
- Machine covers made of shock, damage and fire proof recyclable materials
- Large range of optional accessories
- Large testpiece accommodation H=300mm, D=220mm
can be upgraded to a taller frame of for instance H=450mm, D=220mm or 300mm;
even years after purchasing the tester
- 3 years free firmware upgrade, standard
- Designed and manufactured in The Netherlands, 24 months limited guarantee

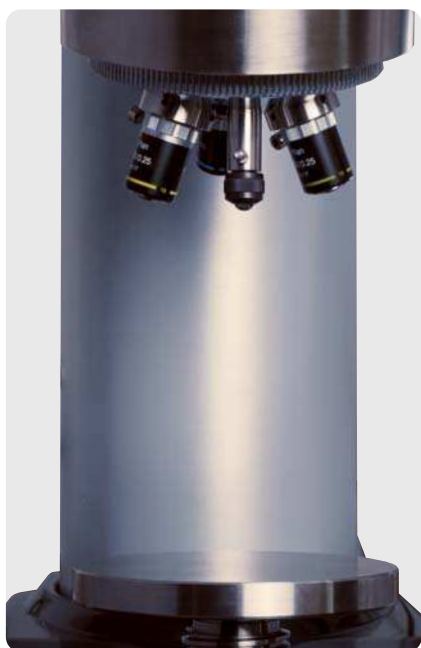
NEMESIS has a rigid linear force actuator to move the test head in the required position. This can be done in 3 different ways. Automatic: the test head will decent to the workpiece after pressing the start button. Automatic workpiece position detection. The descending can also be realized in a manual high speed mode or in a manual "focus" mode.


6 POSITION TURRET, STANDARD ON NEMESIS

A special feature of the NEMESIS 9000™ is the motorized turret which comes as a standard on each system. The turret can hold 3 different indentors and 3 objectives up to 40x magnification, or 6 different indentors on a PURE ROCKWELL model

Combine the turret with an optional X-Y stage, a rotary table or inclination table and create the worlds most comprehensive 4 or 5 axis hardness testing system.

Workpiece position is fixed. No handwheels, no difficult supporting and no spindle to carry heavy parts. No wear and tear caused by heavy workpieces. No workload and no additional drive systems required.


PROTECTION, SAFETY, ONLINE SYSTEMS

NEMESIS 9000™ intelligent sensor systems will register any irregular or unusual force being applied to the turret, and will stop the test head from descending. In this way the system cannot cause injuries. No significant force is applied when any of the objectives are in viewing position.

The NEMESIS test head with force actuator, with or without turret, can be used in on-line structures or being integrated in to production lines requiring automatic testing procedures. The newly developed INNOVAZOOM™ optical system allows stunning, High Definition indent magnification (0.7x to 1000x). Refined algorithms guarantee for accurate automatic measurement.

IMPRESSIONS 9000™, FIRMWARE

IMPRESSIONS 9000™ is the advanced user operating system of the NEMESIS 9000™ Series. The software incorporates, manual and automatic measurement for all scales, image editing, file storing, image storing, report printing, turret operation, manual or automatic focussing and many other advanced functions.

The firmware converts to 3 different hardness (and tensile) scales simultaneously. The conversions can be set to material and standard (ISO/ASTM)

The system also controls an (optional) X-Y stage, rotary or inclining table that can be plugged into the standard built-in driver of the tester. No additional charges, no external devices.

In combination with an X-Y stage the tester offers the option of running case depth hardness programs, pre defined testing patterns and/or other specific or special tasks defined by the user.

All data can be copied or exported in to MS applications like Word, Excel, or a report generator that emails test results directly to your workstation, or server. All data can be accessed over the LAN or WLAN connections.



ANVILS , TEST TABLES, SPECIAL INDENTORS

Each NEMESIS 9000™ is supplied with a standard set of test anvils and worktables. Such set includes 1 V-groove anvil, 1 flat anvil 80mm, 1 large round testing table ø200mm.

Additionally, you can opt for a large range of specific anvils such as a spot anvil, set of V-groove anvils tungsten alloy or diamond surface anvils.

The tester can be equipped with a furnace or cooling unit to test workpieces under high or low temperature. Robot workpiece loading and unloading can be supported by the built-in industrial computer.

To support large workpieces or cylinder blocks you can opt for the (350mm x 250mm) large working stage that incorporates T-grooves for solid workpiece fixing.

Flexible working heights

The NEMESIS 9000™ has a standard working height of 300mm. In case you have larger components NEMESIS is available with different frame heights ranging up to 500mm workpiece height and up to 350mm depth. Ask our sales department for customized options.



X-Y STAGES, ROTARY TABLES, INCLINATION DEVICES

Being Universal means being ready for any task. NEMESIS 9000™ can be equipped with a variety of X-Y stages suitable for different applications. Different testforces require different specifications of the X-Y stages. Size, testload and positioning accuracy can be offered according to your particular requirement.

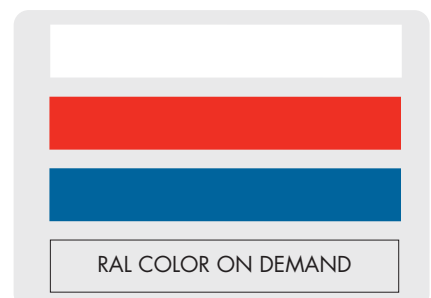
CNC rotary tables and inclining testing tables are available depending on the complexity of your workpieces.



TESTER COLORS

The standard color of NEMESIS 9000™ “ABS” covers is “black”. Your tester can be supplied in any color or paint structure of your choice.

INC-1LW	Laboratory White
INC-2CGM	Charcoal Grey Metallic
INC-3FR	Ferrari Red
INC-4BRG	British Racing Green
INC-5ABL	Atlantic Blue
INC-RAL XXXX	Any RAL color on demand



UNIVERSAL HARDNESS TESTERS

TECHNICAL SPECIFICATIONS	NEMESIS 9001™ UNIVERSAL	NEMESIS 9002™ UNIVERSAL
SCALES / TEST LOADS/FORCE	0.5kgf to 250kgf	1kgf to 750kgf
ROCKWELL, A, B, C, D, E, F, G, H, K, L, M, P, R, V	All scales	All scales
SUPERFICIAL ROCKWELL, N, T, X, Y	All scales	All scales
MACRO ROCKWELL HRM	Yes	Yes
VICKERS HV	500gr to 120kgf	500gr to 120kgf
KNOOP	All scales	All scales
HVT	50, 100kgf	50, 100kgf
BRINELL	500gr to 250kgf	1 to 750kgf
HBT	5/250	5/250
H (ball indentation)	Up to 250kgf	Up to 750kgf
FORCE APPLICATION SYSTEM		
Linear force actuator	Standard	Standard
Load cell, closed loop, force feed back system	Standard	Standard
Motorized heavy duty TURRET with 6 positions	Standard	Standard
Indentor positions	3	3
Objective positions	3	3
LED optical indent illumination	Standard	Standard
LED ring light indent illumination	Optional	Optional
OPTICAL MEASURING SYSTEM		
5 mega pixels INNOVAVIEW™ optical ZOOM system	Standard	Standard
Auto focus	Standard	Standard
Manual focus	Standard	Standard
Fully automatic indent measuring	Standard	Standard
Manual on screen indent measuring	Standard	Standard
Zoom and magnification ratio	0.7x to 1000x	0.7x to 1000x
Dual view™ working area overview camera	Optional	Optional
External Electronic Brinell microscope and objectives	No	No
DEPTH MEASUREMENT SYSTEM		
Heidenhain™ high resolution scale & reading head	Standard	Standard
HARDWARE & USER INTERFACE		
Built-in industrial Pentium PC and harddrive	Standard	Standard
Adjustable 15" full color industrial touch screen	Standard	Standard
MS Windows 7 Ultimate license	Standard	Standard
IMPRESSIONS 9000™ hardness testing firmware	Standard	Standard
Automatic image and file storage	Standard	Standard
Stores and handles 3000 files & images	Standard	Standard
Stores and handles 9000 files & images	Optional	Standard
Forms 9000™ set of customized certificates	Optional	Standard
Universal motorized X-Y stage controls	Standard	Standard
CONNECTIVITY		
External digital (DVI) TFT screen output	Standard	Standard
External keyboard & mouse connections	Standard	Standard
LAN (local area network connection)	Standard	Standard
WLAN (Wireless network connection)	Standard	Standard
Bi-directional RS-232	Standard	Standard
Printer / USB-2 output	Standard	Standard
Built-in motorized X-Y stage driver	Standard	Standard

Workpiece accommodation height : 300mm (opt. 500mm)

Workpiece accommodation horizontal : 220mm from center (opt. 300mm)

Machine dimensions

: 1400mm x 420mm x 640mm (HxWxD)

Machine weight

: 242kg

Tester color (standard)

: Black / Metallic silver

Light source

: White power LED (Opt. green/blue/red)

Power

: 220volt / 50Hz, others on request

Objectives

: 3 installed for 0.7x to 1000x

Force tolerance

: Max. < 1%

Force control

: 1-99 sec.

Hardness resolution: 0.01 Rockwell, 0.1 Vickers,
1 Brinell

NEMESIS 9000™ SERIES

NEMESIS 9003™ UNIVERSAL	NEMESIS 9004™ PURE ROCKWELL	NEMESIS 9005™ PURE VICKERS	NEMESIS 9006™ PURE BRINELL
10kgf to 3000kgf	0.05kgf to 150kgf	0.5kgf to 120kgf	10kgf to 3000kgf
All scales	All scales	No	No
No	All scales	No	No
Yes	Yes	No	No
10kgf to 120kgf	No	500gf to 120kgf	No
No	No	All scales	No
50, 100kgf	No	No	No
10kgf to 3000kgf	No	No	10kgf to 3000kgf
5/250	No	No	No
Up to 3000kgf	No	No	Up to 3000kgf
Standard	Standard	Standard	Standard
Standard	Standard	Standard	Standard
Standard	Standard	Standard	No
3	3 (or 6, option)	3	None
3	None	3	None
Standard	None	Standard	None
Optional	None	Optional	None
Standard	None	Standard	None
Standard	No	Standard	No
Standard	No	Standard	No
Standard	No	Standard	No
Standard	No	Standard	No
0.7x to 1000x	No	0.7x to 1000x	No
Optional	No	Optional	No
No	No	No	Standard
Standard	Standard	No	No
Standard	Standard	Standard	No
Standard	Standard	Standard	No
Standard	Standard	Standard	No
Standard	No	Standard	No
Standard	Standard	Standard	No
Standard	Standard	Standard	No
Standard	Standard	Standard	No
Standard	Standard	Standard	No
Standard	Standard	Standard	No
Standard	Standard	Standard	No
Standard	Standard	Standard	No
Standard	Standard	Standard	No
Standard	Standard	Standard	Standard
Standard	Standard	Standard	Standard
Standard	Standard	Standard	No

Standard delivery

- Diamond Rockwell indenter (9001, 2, 3, 4)
- Vickers pyramid indenter (9001, 2, 3, 5)
- Brinell indenter (9001, 2, 3, 6)
- Flat anvil ø80mm, V-anvil ø80mm, ø200mm testing table
- Installation & user manual

Optional accessories

- Large testing table 350mmx250mm with T-grooves
- Extra large testing table 450mmx350mm with grooves and support
- Long bar supports, to ease testing long bars
- Motorized X-Y stages, motorized rotary or tilting tables
- Built-in 5 axis support driver
- Certified indentors and reference blocks (DKD, UKAS, ASTM)

Load cell, closed loop,
linear force actuator,
fixed workpiece position

Force configuration for
maximum 750kgf or
3000kgf

6 Positions modular motorized
turret, 5 Mp built-in camera,
Optional overview camera

LED illumination,
LED ringlight

Microscope quality
optical system with
long working distance
objectives

Motorized spindle

High performance PC, Windows
7 driven operating system with
refined algorithms for automatic
image measuring system

15" high
resolution
industrial
touch-screen



9500™ SERIES

3KGF TO 3000KGF, 6 POSITION MOTORIZED TURRET

The 9500 is the universal hardness tester most suitable for heavy duty testing in the INNOVATEST® standard range of testers. Partly based on the technology of the NEMESIS 9000™. Built for tough environments. The floor type welded frame reaches a height of 2 meters and offers a workspace of not less than 650mm height and a throat depth of 300mm.

Rockwell, Vickers and Brinell, but also pure depth test methods such as H, HVT and HBT are part of the standard test procedures of the 9500™. 2 models cover a range of test loads either up to 750kgf or 3000kgf.

The frame of the 9500™ is equipped with a heavy duty motorized spindle, allowing to position the test piece on the required working height.

The 9500™ has a descending test head allowing each test piece to be tested on an ergonomic working height. The linear actuator of the 9500™ is equipped with a load cell closed loop system guaranteeing excellent accuracy and a wide range of fast testing procedures.

The test head is equipped with a 6 positions modular turret (indentors and objectives) and an optical zoom video system with 5mp HD camera.

High performance PC driven automatic and manual indent measurement with automatic filing and storage functions.

Refined algorithms for automatic measurement on materials normally less suitable for automatic measurement.

TECHNICAL SPECIFICATIONS

Hardness scales	Brinell, Vickers, Rockwell, HVT, HBT
Load application	Load cell, force feed back, closed loop system
Load range	3 - 750kgf, 10 - 3000kgf
Motorized turret	3 indentor positions; 3 objectives positions
Optical system	High definition, 5Mp machine Vision system
Objectives	3 installed for 0.7x - 1000x magnification
Scale resolution	0.0005mm (0.5 micron)
Electronic system	High performance built-in PC, Windows 7, 15" full color touch screen, automatic and manual measurement
Standards	Complies to all applicable EN/ISO and ASTM standards
Test loads	3, 5, 10, 15, 15.625, 20, 30, 31.25, 45, 50, 60, 62.5, 100, 125, 150, 187.5, 250, 750, 3000kgf
Vickers test range	HV 3, 5, 10, 20, 30, 50, 100; HVT 50, 100kgf
Brinell test range	10 - 3000kgf (depending on model)
Rockwell test scales	A, B, C, D, E, F, G, H, K, L, M, P, R, S, V
Test cycles	Automatic & Manual
Force control	2- 99 seconds
Connectivity	USB-2, Blue tooth, WLAN, LAN
Specimen accommodation	Max. height: 650mm Max. throat: 300mm
Machine dimensions	1930mm x 1130mm x 470mm (HxDxW)
Machine weight	870kg
Power supply	220V / 50Hz others on request

ORDER DETAILS

9500 Heavy duty universal hardness tester

STANDARD DELIVERY

- Diamond Rockwell indentor
- Vickers indentor
- Brinell indentor 2.5mm
- Hardness test block HRA
- Hardness test block HRC
- Hardness test block HRB
- Hardness test block HV30
- Hardness test block HB2.5/187.5
- Motorized turret with 6 positions
- Objectives for 0.7x - 1000x magnification
- Built-in 3 axis support driver
- Large testing table
- Installation & user manual
- Calibration certificate
- Toolset

OPTIONAL ACCESSORIES

- Built-in 5 axis support driver
- Testing table ø235mm
- V-Anvil ø80mm
- V-Anvil ø120mm
- Certified indentors & hardness test blocks
- Long Vickers indentor
- Other testing tables and XY-stages
- Precision vices, V-blocks and special clamps