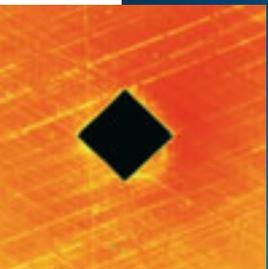


Duramin-500



Universal hardness tester for Vickers, Brinell, Rockwell and Superficial Rockwell

Very easy to operate due to
the large colour touch-screen
and the intuitive software



- Unique test load range from 9.8 N (1 kgf) to 2452 N (250 kgf) or 29 N (3 kgf) to 7355 N (750 kgf) enables Duramin-500 to replace several single-task machines
- Suitable for Vickers, Brinell, Rockwell and Superficial Rockwell testing
- Unique, patent-pended, automatic 5-position turret (option) that can be employed in the load range ≥ 3 kgf
- Optional motorized height adjustment of the anvil (z-axis)
- Large, colour touch-screen display for easy operation
- Intuitive user interface with easy selection of parameters from pull-down menus
- Adjustable contrast and brightness settings for optimal image and repeatable image evaluation
- Innovative, patent-pended closed-loop technology, ensures accurate test loads
- State-of-the-art focus technology enables the system to auto focus fast and perfectly the first time
- Completely automatic test cycles eliminate operator influence
- Automatic exchange of indenter and objective lens, eliminates the number one cause of machine misalignment
- Automatic image evaluation (option) of Vickers and Brinell indents assures the highest possible repeatability and reproducibility
- Correction possibility for measuring samples with convex/concave surfaces
- Built-in statistical evaluation and reports for printing
- USB and Ethernet ports for connection to printer, mouse and LAN

Intuitive drop-down menus ensure easy operation



Wide application range

Duramin-500 is designed specifically for the laboratory or quality control station that is looking to eliminate operator influence during indentation measurement, thus assuring the highest repeatability.

A variety of models are available for automatic or manual evaluation, with automatic turret or manual swivel system, and with motorized or manual anvil height adjustment.

The combination of cutting edge technology and ease-of-use make the Duramin-500 models with manual image evaluation the obvious replacements for traditional mat-screen testers.

With test load range up to 250 kgf or 750 kgf Duramin-500 is able to cover the following load ranges:

- Vickers:** 1-120 kgf
- Brinell:** 2.5-250 kgf or 2.5-750 kgf
- Rockwell:** 60, 100 and 150 kgf
- Superficial Rockwell:** 15, 30 and 45 kgf

Intuitive touch screen operation

A large LCD touch screen and intuitive pull-down menus ensure very easy operation. Hardness data and images are automatically saved for statistical evaluation and reporting.

The Duramin-500 software includes:

- Methods and surface settings
- Hardness conversion
- Manual re-measuring possibilities
- Statistics
- Reporting templates
- User fields
- User level management

Methods and surface settings

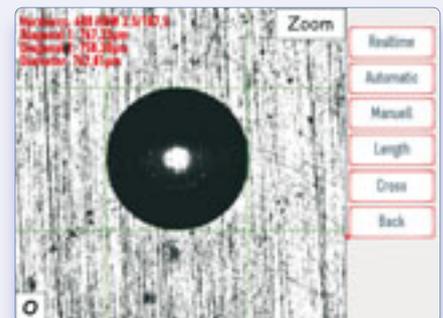
As not all surfaces reflect light equally, a major challenge of fully automatic image analysis systems is to ensure the optimal lightning and contrasting to define the indentation tips correctly.

Duramin-500 allows you to define surface settings for specific materials and surface characteristics (e.g. etched surfaces or very dark or reflective surfaces). On models with automatic image evaluation, the settings are stored in combination with load and lens magnification and can easily be selected from the drop-down menu. This ensures that a material is always tested with the same settings, independently of operator, thus offering the highest reproducibility.

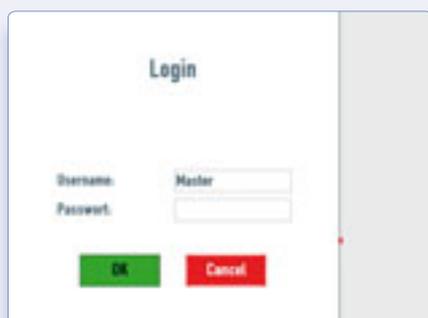
Models with manual image evaluation e.g. M25 and M75 do not include methods with surface settings. Instead the lightning settings are performed each time directly on the LCD touch screen. Even on models with automatic evaluation, manual mode can be selected allowing fast and easy testing on one-off samples where settings do not need to be saved for repeated use.

Reporting and statistics

Duramin-500 is equipped with 2 USB ports allowing the connection of a printer, mouse or keyboard. Report templates are available for easy printing of test reports. User fields can be defined allowing the operator to enter specific information on samples or test series. The user fields are included in reports. Statistical evaluation of the measurements including minimum, maximum, average, standard deviation, Cp and Cpk can be viewed graphically directly on the LCD screen and included in printed reports.



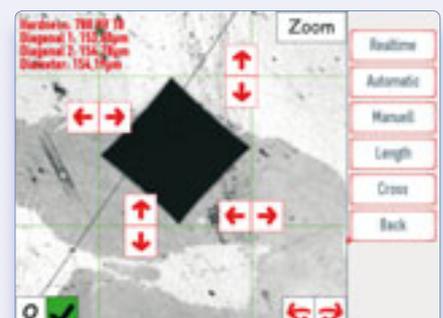
Automatic evaluation window.



Login screen. Three different user levels are available.



Measurements window



Manual re-measuring window.

The automatic turret holding five positions, facilitates lens and indenter exchange and ensures correct lens selection



An Ethernet port allows connection to a company LAN for central storage of measurement data.

Convex and concave surface correction

Duramin-500 gives you the possibility to correct measurement values on samples with convex or concave surface. The input of the diameter of the sample automatically results in the corrected hardness value.

Time saving automatic test cycles

Regardless of model, the entire test cycle of applying load, uploading, focusing and capturing of the image (Vickers and Brinell) is performed fully automatic. This greatly improves reproducibility as operator influence is not required, thus preventing causes for potential vibrations.

Innovative closed-loop technology

Duramin-500 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 measurements at all test loads. The common load over-

shoot 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. Duramin-500 not only conforms to all standards but offers higher accuracy, which will ensure that the unit also can do the job in the future.

State-of-the-art auto focus technology

An important result of the use of the closed-loop technology is the fast and reliable auto focus system. Since the load cell detects exactly when the indenter touches the specimen, the system is also able to bring the objective lens in focus automatically every time. Not relying on an image analysis system and correct contrasting eliminates iterative focusing adjustments and saves a lot of operation time.

Duramin-500 uses the load-cell displacement to focus perfectly on first attempt, even on specimens with surface characteristics that are usually hard to focus automatically.

Automatic turret

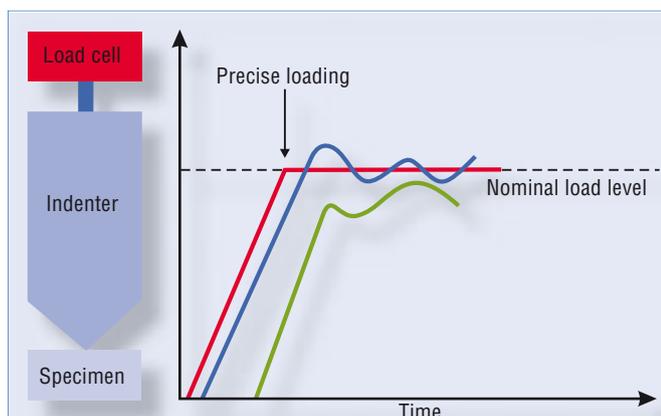
Duramin-500 is available with a swiveling body or alternatively a 5-position automatic turret facilitating exchange between three indenters (e.g. Rockwell, Vickers and Brinell) and two objective lenses, or two indenters and three objective lenses.

The patent-pended, automatic turret can be employed in the load range ≥ 3 kgf.

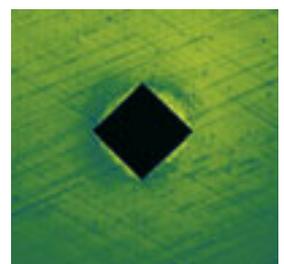
Regardless of model, the exchange of indenter and lens runs fully automatic. The operator does not touch the machine, which eliminates the number one cause of machine misalignments.

Accessories

The Duramin-500 hardness tester is supplied with a 90 mm dia. anvil and mounted on a sturdy designed support table with drawers for convenient storing of accessories. A wide range of objective lenses, indenters and additional anvils in various sizes and shapes are available. See the following page for details.



The load is applied accurately due to the closed-loop technology. No load overshoot or undershoot as commonly known from dead weight systems



Accessories

Objective Lenses for models with Swiveling Body	Code	Cat.no
Objective Lens, 40x, for swiveling body, including LED lighting	HOTIA	05836901
Objective Lens, 70x, for swiveling body, including LED lighting	HOTIB	05836902
Objective Lens, 130x	HOVIA	05636903
Objective Lens, 320x	HOVIB	05636904
Objective Lens, 640x	HOVIC	05636905
Objective Lens, 1280x	HOVID	05636906
LED lighting, for lenses HOVIA, HOVIB, HOVIC and HOVID	HOLED	05636937

Objective Lenses for models with Automatic Turret

Objective Lens, 50x	HOTID	05836904
Objective Lens, 69x	HOTIE	05836905
Objective Lens, 130x	HOVIA	05636903
Objective Lens, 320x	HOVIB	05636904
Objective Lens, 640x	HOVIC	05636905
Objective Lens, 1280x	HOVID	05636906

Indenters

Vickers diamond indenter for \geq HV0.01 with MPA-certificate	HAVIL	05646913
Vickers diamond indenter for \geq HV5 with MPA-certificate	HAVIH	05646914
Rockwell diamond indenter with MPA-certificate	HAROC	05646906
Rockwell 1/16" carbide ball indenter with MPA-certificate	HAROB	05646907
Brinell 1 mm carbide ball indenter with MPA-certificate	HABON	05646904
Brinell 2.5 mm carbide ball indenter with MPA-certificate	HABTO	05646905
Brinell 5 mm carbide ball indenter with MPA-certificate	HABFI	05646911

Anvils

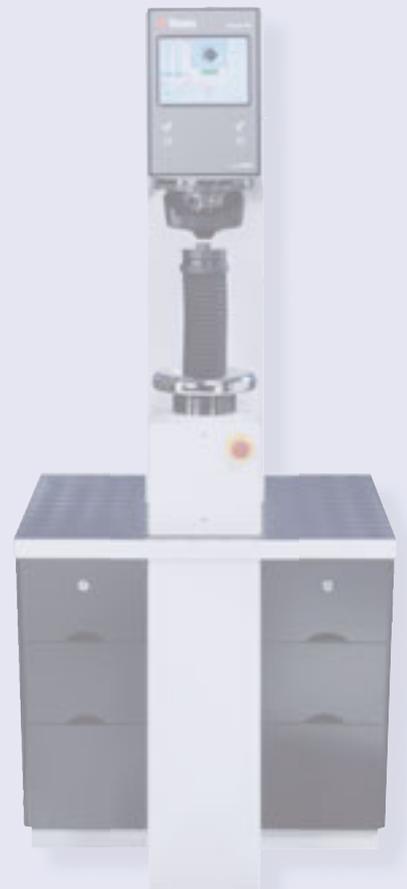
Plane/Flat Anvil, 10 mm dia.	HAPAN	05636915
Plane/Flat Anvil, 20 mm dia.	HAPAW	05636916
Plane/Flat Anvil, 235 mm dia.	HAPAT	05636918
Plane/Flat Anvil, 600 x 400 mm for manual z-axis	HAPAS	05636919
Plane/Flat Anvil, 600 x 400 mm for motorized z-axis	HAPAX	05836906
V-Anvil, 4-10 mm dia.	HAVAF	05636920
V-Anvil, 8-20 mm dia.	HAVAE	05636921
V-Anvil, 15-55 mm dia.	HAVAI	05636922
V-Anvil, 30-220 mm dia.	HAVAT	05636923
Narrow Gage V-Anvil, 4-10 mm dia.	HANAF	05636928
Narrow Gage V-Anvil, 8-20 mm dia.	HANAE	05636929
Narrow Gage V-Anvil, 15-55 mm dia.	HANAI	05636930

Other Accessories

Nose cone for automatic turret, for Rockwell testing	DURNO	05636941
Dust Cover	DUREC	05636913

When mounted in the swiveling body, the lenses 130x, 320x, 640x and 1280x need to be combined with the LED lighting (HOLED). Only one LED lighting is necessary. The correct selection of objective lens depends on the test method and the material hardness.

Please refer to the Objective Lens Selection Guide on www.struers.com/Duramin-500 for assistance.

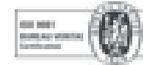


Specifications

Duramin-500 Hardness Testers

Model	Description	Code	Cat.no
Duramin-500 M25	Load range 9.81 N to 2450 N. Manual image evaluation. Manual adjustment of anvil height.	DUM25	E5836019
Duramin-500 M75	Load range 29 N to 7350 N. Manual image evaluation. Manual adjustment of anvil height.	DUM75	E5836119
Duramin-500 A25	Load range 9.81 N to 2450 N. Automatic image evaluation. Manual adjustment of anvil height.	DUA25	E5836219
Duramin-500 A75	Load range 29 N to 7350 N. Automatic image evaluation. Manual adjustment of anvil height.	DUA75	E5836319
Duramin-500 T75	Load range 29 N to 7350 N. Automatic 5-position turret. Automatic image evaluation. Manual adjustment of anvil height.	DUT75	E5836519
Duramin-500 Z25	Load range 9.81 N to 2450 N. Automatic image evaluation. Motorized anvil.	DUZ25	E5836619
Duramin-500 Z75	Load range 29 N to 7350 N. Automatic image evaluation. Motorized anvil.	DUZ75	E5836719
Duramin-500 ZT75	Load range 29 N to 7350 N. Automatic 5-position turret. Automatic image evaluation. Motorized anvil.	DUZT7	E5836919





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Technical data

Specific data for models with swiveling body

	M25	A25	Z25	M75	A75	Z75
Test load range	9.8 N (1 kgf) to 2452 N (250 kgf)			29 N (3 kgf) to 7355 N (750 kgf)		
Preloads Rockwell	29 N (3 kgf) and 98 N (10 kgf)					
Objective lenses	40x, 70x, 130x, 320x, 640x, 1280x					
Anvil/stage height adjustment	Manual		Motorized	Manual		Motorized
Test height [mm]	0-260 mm		0-305 mm	0-260 mm		0-305 mm
Throat depth [mm]	200 mm		190 mm	200 mm		190 mm

Specific data for model with automatic turret

	T25	M25ZT	T75	ZT75
Test load range	29 N (3 kgf) to 2452 N (250 kgf)		29 N (3 kgf) to 7355 N (750 kgf)	
Preloads Rockwell	29 N (3 kgf) and 98 N (10 kgf)			
Objective lenses	50x, 69x, 130x, 320x, 640x, 1280x			
Anvil/stage height adjustment	Manual	Motorized	Manual	Motorized
Test height [mm]	0-215 mm	0-260 mm	0-215 mm	0-260 mm
Throat depth [mm]	200 mm	190 mm	200 mm	190 mm

General data

Camera	½" camera, 1280 × 1024 pixels
Light source	Adjustable LED
Display	8.4" TFT LCD, 170 × 130 mm, 800 × 600 pixels
Test anvil support	25 mm dia. / 1" dia.
Max. specimen weight	50 kg / 110.2 lbs
Connection ports	2 USB, Ethernet, RS 232
Power supply	1 × 110-230 V / 50-60 Hz
Power consumption	200 VA
Dimensions	(H) 1755 mm × (W) 750 mm × (D) 700 mm (H) 69.1" × (W) 29.5" × (D) 27.6" Including support table
Weight	Approx. 280 kg / 617.3 lbs
Shipping weight	Approx. 450 kg / 992.1 lbs
Conforms with standards	Vickers: DIN EN ISO 6507, ASTM E92, JIS Z 2251 Brinell: DIN EN ISO 6506, ASTM E10 Rockwell: DIN EN ISO 6508, ASTM E18

Struers' equipment is in conformity with the provisions of the applicable International Directives and their appurtenant Standards. (Please contact your local supplier for details)

Struers' products are subject to constant product development. Therefore, we reserve ourselves the right to introduce changes in our products without notice.

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