

» **Unmatched accuracy**

– using precise Rockwell-type testing method

» **Unrivalled testing speed**

– as fast as six seconds per test cycle

» **No operator interpretation of impressions needed**

– removes a common source of inaccuracies

» **Custom fixturing**

– enables measurement of larger samples to further reduce prep time

» **Less sample polishing needed**

– a 400 grit polish is all that is needed for accurate results

» **Easy set up of traverses**

– up to 24 traverses for a single procedure

» **Numerous report formats**

– easy to transfer results internally, as well as to customers



Unrivalled
speed and accuracy!

Better than traditional testing systems – Accurate, fast and easy testing

The Newage[®] MT91 System is an automatic microhardness testing system that uses the Rockwell method for the hardness result. Hardness is measured based on the depth of penetration rather than using an optical system to determine hardness based on the impression diameter.

The main advantages of the MT91 Series are its very fast test cycle coupled with its incredible test accuracy. No traditional microhardness testers can come close to matching the MT91 in speed or accuracy, since no manual interpretation of the impression is required.

Entire case depth analysis can be made in a few minutes – an individual test cycle is just six seconds. What used to take hours now takes only minutes – making the MT91 perfect for high-volume applications.

All systems conform to relevant EU standards and are CE marked

The Newage MT91 System is a modular and cost-effective solution for applications requiring advanced microhardness testing functionality, such as complex case depth traverses. The MT91 System starts with a MT91 microhardness tester with video camera, combined with our C.A.M.S.[®] Computer Assisted Measurement System software, a personal computer and a motorized X-Y axis positioning table.

The MT91 System uses a video camera to view and define test measurement locations and traverse procedures. The C.A.M.S.[®] software operates the test head and motor control system to accurately position the test samples and perform the measurement cycles.



Special features

Surface preparation

In comparison to automated optical microhardness testers, the MT91 is less dependent on surface conditions. There are no difficulties with dark spots or varying light levels on the sample that can easily mislead the optical interpretation of the actual impression edge. The MT91 can be used to test etched parts or on surfaces prepared to a 400 grit polish – much less finishing is required than with traditional optical systems.

Case depth analysis

Case depth analysis is also considerably easier using the MT91 System. Operators can easily and quickly set up complicated staggered traverse procedures with the graphical setup utility. The MT91 will then perform the traverse routine to accurately and repeatedly measure the case depth on the sample. The tester can perform a traverse so fast that it can be used for process control. The operator starts with a point-and-shoot procedure and the MT91 does the rest. Setting up multiple specimens is a simple point-and-shoot task – locate the starting point and the traverse direction on each sample and start the test. Up to 24 traverses can be setup as part of a single procedure.

Test setup tools

The MT91 C.A.M.S.[®] software complements the advanced video capabilities of the system by providing comprehensive test setup tools, including intelligent prompts and menus that guide the user through the test configuration process – from basic microhardness testing to sophisticated case depth profiling. Test configuration is intuitive and information is presented in a logical, step-by-step sequence. A variety of testing attributes are presented so configuration is as simple as selecting options from a list; requiring minimal text entry.

Once the test setup is configured, the MT91 System provides the user with a variety of on-screen navigation tools. For example, motorized positioning lets you select from three ways to direct movement of the test sample using the X-Y table. You can use the virtual joystick controlled from the computer display. You can use eight directional arrows on the display to jog the position of the sample by as little as 1 μ (0.001mm) increments – ideal for stepping through traverse positions. Or you can click on the visible feature on the screen and it will be moved to the center of the screen, ideal for quickly positioning the start positions of traverses. Operators can be prompted during the test to enter specific information about the current test process.

The MT91 System's on-screen analysis is exceptional. A comprehensive display shows your hardness results, converted values and tolerances at a glance. Operators can even orient the traverse direction to each test part – on the screen and within seconds.

Programming features

Features for individual measurements

The MT91 System software is file-based. All setup parameters such as hardness scale, tolerance limits, part information, etc. are created and saved with the individual file. Files are created in a .csv format. Each new file has a set of attributes that define the test file. These attributes may include:

- Part number
- Part name
- Spec order
- Heat number
- Load number
- Furnace number
- Lab number

You also have the ability to add comments to further define the test setup file.

Scale selection and conversion

During test setup you configure a primary and secondary scale. The primary scale is normally HRC. The secondary scale can be Vickers, Knoop, and most common Rockwell scales. A menu is provided for scale setup.

Averaging

Averaging allows you to save averaged results for a group of tests rather than the results of each and every individual test result. You may specify the number of results that comprise a group for which the averaging is performed. Options for averaging include: use all results, eliminate the highest and lowest result, eliminate the furthest result from the average, and eliminate if the standard deviation exceeds a user-defined value.

Tolerances

You may set tolerances for your test to provide warnings and indications on individual test results. Tolerance settings include: low tolerance limit, low tolerance warning, high tolerance limit and high tolerance warning. Tolerance limits can be set to produce an audible alarm and they can be set up to require the operator to acknowledge the tolerance condition.

Features for traverse measurements

The MT91 C.A.M.S.® software uses all the features above combined with the traverse measurement functions. These features include:

Straight and staggered traverses

Operators can easily create traverses in a simple straight line or more complicated staggered patterns. Each data point can have a tolerance applied. Traverses can be designed to move in either inch or millimeter steps to fit your specifications. Once a traverse is created all settings are maintained so subsequent measurements are all made with the same test settings; ensuring accurate, repeatable results.

Graphics pattern measurements

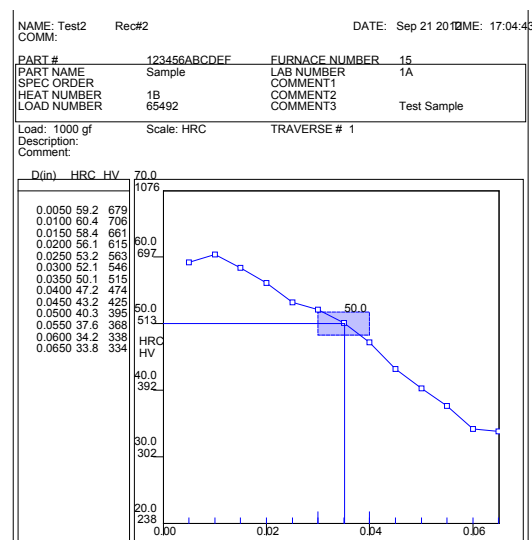
Traverses can be created that measure test locations in any pattern desired on the test sample. This pattern can be rotated to correspond with the next sample even it is not placed in the self-leveling vise in the same orientation.

Multiple traverse mode

Operators may set up a second, third or additional traverse allowing multiple traverses to be performed. Up to 24 traverses may be configured as part of one procedure. The operator may also select a specific traverse within a multiple traverse procedure.

Effective case depth

The operator is prompted to enter the effective case hardness values to calculate the case depth. Up to three case hardness values may be entered for each test file. Each value may have its own effective case depth distance tolerance. Surface test and Core test values may also be established with an "offset" value that determines the distance from the traverse origin and with related hardness tolerances. Case hardness setup options include User Defined, Nitride Case, Eht Case, Rht Case and Nht Case. The Eht, Rht and Nht cases all calculate the case depths per ISO and DIN specifications.



Operation

On-screen navigation tools

MT91 System operators frequently comment on the system's exceptional user friendliness. The on-screen navigational tools are intuitive and easy-to-use. As an example, a right click of the mouse automatically positions the sample from the cursor position to the center of the display – ideal for centering impressions, selecting a test position or for just navigating across the display.

On-screen arrow control keys can be used to jog the sample's position or stepping through traverse positions. You can select standard jog increments in metric or imperial units. Metric increments can be set as small as 1 μ . You can even define your own increments.

A joystick can also be used to position the table, and thus the part, under the zoom microscope. The + and – buttons adjust the table speed when the joystick is used.

You can have a user-defined home position so you always have a reference position.

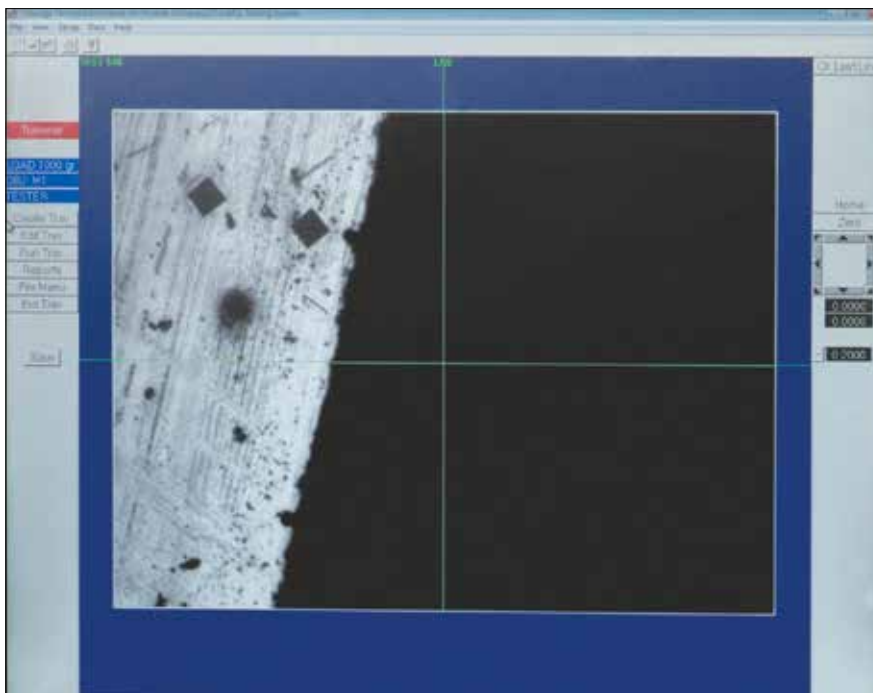
Data management and reporting

The MT91 System is supplied with comprehensive data management tools and report generation capabilities. A variety of standard report formats are provided. Operators can capture images of the impression, plot overlays or multiple case curves for comparison; perform statistical calculations and generate tabular and graphical reports quickly and easily.

An assortment of reports and display views can help you analyze your test data. There are seven different views that can be accessed via a menu: X-Bar and R Chart, Histogram, History Data, Tile, Auto Tile, Tool Bar and Status Bar.

A report view shows the data from the current test file as well as the associated histogram and X Bar/R Chart.

An on-screen statistics display shows a comprehensive statistical report for a range of user-defined results. The display report is provided for each test result. If multiple traverses are setup under a traverse specification, then a separate page will be reported for each curve.



Specifications

Test cycle	Rockwell, penetration depth
Cycle time	Automatic with 1000 gf load
Positioning	6-9 seconds
Position accuracy	Motorized X-Y positioning. Better than 0.00025"
Video	CCD video with 20-140X magnification
Scale	Displays results in HRC, Vickers, Knoop and other common Rockwell scales
Operating temperature	50 to 120°F (10 to 49°C)
Warranty	1 year

Ordering information

MT91 Series System

Model	Description
MT-91/ASW*	Fully automatic MT91 Microhardness System, automatic X-Y, software

*Other system configurations are available to suit specific applications.

Options

Model	Description
MT91-GR	Special software for graphic traverse on welds
C50011101	Vibration isolation pads, set of 6

Newage Testing Instruments offers calibration service which is accredited to A2LA.

Newage hardness testing – easy and accurate



At Newage Testing Instruments we provide our customers with the benefit of our vast experience in the area of design and construction of Rockwell and Brinell type testing systems. For over 50 years, we have produced standard and custom systems for major manufacturers and government agencies covering virtually every type of industry base imaginable. Many of these systems, still in continuous use and operation, are a true testament of the reliability and longevity that are design features of every Newage Custom and Automatic Test System.

Our sales and service staff, as well as our associates, have the capability to support hardness testing needs anywhere in the world. You can expect the upmost service and experience when you contact us.



Watch our MT91 video by using the QR code.



AMETEK Test & Calibration Instruments

A business unit of AMETEK Measurement & Calibration Technologies offering the following industry leading brands for test and calibration instrumentation.

Newage Hardness Testing

Newage offers a comprehensive range of hardness testers, durometers, optical systems and software for measurement, data acquisition and analysis.

LLOYD Materials Testing

Materials Testing Solutions

Materials testing machines and software from Lloyd Instruments guarantee the highest level of performance and capability for production testing, quality control, laboratory testing, research and education to provide expert materials testing solutions.

Davenport Polymer Test Equipment

Allows critical polymer parameters to be determined, including melt flow index and melt flow rate, intrinsic viscosity (IV) measurement of moisture-sensitive PET polymers and polymer density measurement.

Texture Analysers

The comprehensive program provides the platform to perform rapid, general food testing and detailed texture analysis on a diverse range of foods.

Chatillon Force Measurement

Chatillon has been a hallmark in the industry since 1835. The hand held gauges and motorized testers have earned their reputation for quality, reliability and accuracy and they represent the de facto standard for force measurement.

JOFRA Calibration

The inventor of the portable high precision dry-block temperature calibrators. The calibration instruments program also covers precision thermometers and temperature baths, temperature sensors handheld instruments for pressure calibration and process signal calibrators for easy control loop calibration, measurements and simulation.

M&G Calibration

Pneumatic floating-ball or hydraulic piston dead weight testers with accuracies to 0.015% of reading.

AMETEK®

TEST & CALIBRATION INSTRUMENTS

UK

AMETEK TCI

Tel +44 (0)1243 833 370
uk-far.general@ametek.co.uk

France

AMETEK S.A.S.

Tel +33 (0)1 30 68 89 40
general.lloyd-instruments@ametek.fr

Germany

AMETEK GmbH

Tel +49 (0)2159 9136 510
info.mct-de@ametek.de

Denmark

AMETEK Denmark A/S

Tel +45 4816 8000
ametekdk@ametek.com

USA

AMETEK Measurement & Calibration Technologies

Tel +1 (215) 355 6900
newage.info@ametek.com

India

AMETEK Instruments India Pvt Ltd.

Tel +91 22 2836 4750
ametekdk@ametek.com

Singapore

AMETEK Singapore Pte Ltd

Tel +65 6484 2388
ametekdk@ametek.com

China

AMETEK Inc. - Shanghai

Tel +86 21 5868 5111

AMETEK Inc. - Beijing

Tel +86 10 8526 2111

AMETEK Inc. - Guangzhou

Tel +86 20 8363 4768
lloyd@ametek.com.cn