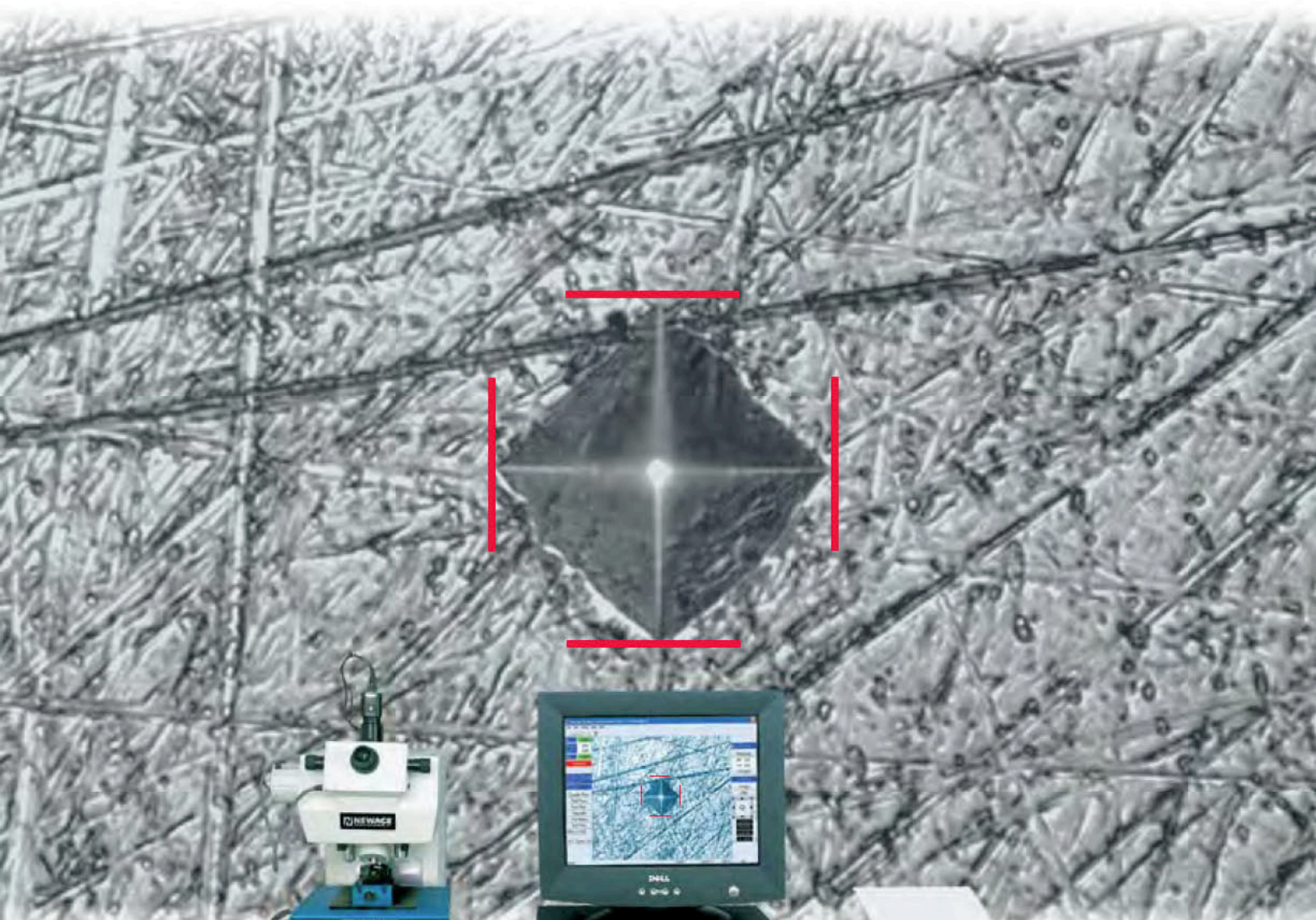


C. A. M. S.™

COMPUTER ASSISTED MICROHARDNESS SYSTEM

The Automatic Microhardness Testing Solution that Works.



NEWAGE
Testing Instruments
An **AMETEK** Company

C. A. M. S.

COMPUTER ASSISTED MICROHARDNESS SYSTEM

Modular. Adaptable. Upgradeable. Simple. Accurate.

Is your company looking to reduce the cost in a variety of microhardness applications?

Then the Newage C.A.M.S., Computer-Assisted Microhardness System, is your best answer. The system combines a microhardness tester with a computer, software options, and manual or motorized test sample positioning in 1, 2, or 3 axes.

Compared to other systems, C.A.M.S. is the one system that has the accuracy in all types of applications, usability for any level of operator skill, and the range of features and options to fit into your current operations and handle most contingencies. It is the one system that has been built from the ground up solely for microhardness testing.

C.A.M.S. is modular, adaptable and upgradeable. Your company can start with a basic system and upgrade later, if requirements change. Whatever requirements your company has, Newage can provide a system that will maximize the testing capability for a range of budgets.

You Can Depend on Newage.

- Newage has delivered more automatic traverse systems than other hardness testing suppliers.
- Newage has more models in traverse testing.
- Newage software is completely programmed inhouse - for better support and customization.
- The C.A.M.S. system is built to last with heavy-duty materials and quality components characteristic of all Newage testers.
- The C.A.M.S. system can be used to upgrade competitive microhardness testing systems- even their advanced models.
- C.A.M.S. conforms to ASTM requirements for Microhardness and Vickers testing (ASTM E384 and E-92).

Model Selections

Start with a standard Newage microhardness tester.

Add options to create the optimum tester for your application and your budget.



BASIC ON-SCREEN MEASUREMENT SYSTEM

Makes indentations, then manually or automatically measures the indentations, depending on options.

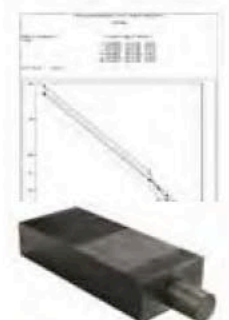
MANUAL POSITIONING TRAVERSE SYSTEM

Provides setup options to prompt operators for test positions. Includes data storage and automatic graphing.



SINGLE-AXIS AUTOMATIC TRAVERSE SYSTEM

Provides a single-axis motorized table for straight-line traverses, automatic graphing, and optional auto-focus.





**COMPLETE AUTOMATIC TRAVERSE
MICROHARDNESS TESTING SYSTEM**

Features complete automatic traverse capability with automatic positioning in two axes, plus automatic focusing as well as a wide range of other options.

UPGRADE EXAMPLES ON COMPETITIVE MICROHARDNESS TESTERS.

BASIC MICROHARDNESS TESTERS

Example of a standard Leco microhardness tester upgraded for automatic measurement capabilities.

AUTOMATIC TRAVERSE SYSTEMS

One of two automatic Clemex micro-hardness testers used in the aerospace industry that were upgraded with Newage software and motor control.



INCREASED PRODUCTIVITY. REDUCED TESTING COSTS. FAST RETURN ON YOUR INVESTMENT.

C.A.M.S. operation is simple, even for your most sophisticated testing. All operations can be completed using basic procedures. And the intuitive controls allow you to add specialized capabilities at any time. As your needs grow, your system can be continually upgraded and enhanced with additional features. Your investment in C.A.M.S. ensure a fast return on that investment and increased productivity and reduced testing costs.

EXAMPLE 1: TRAVERSE OPERATIONS

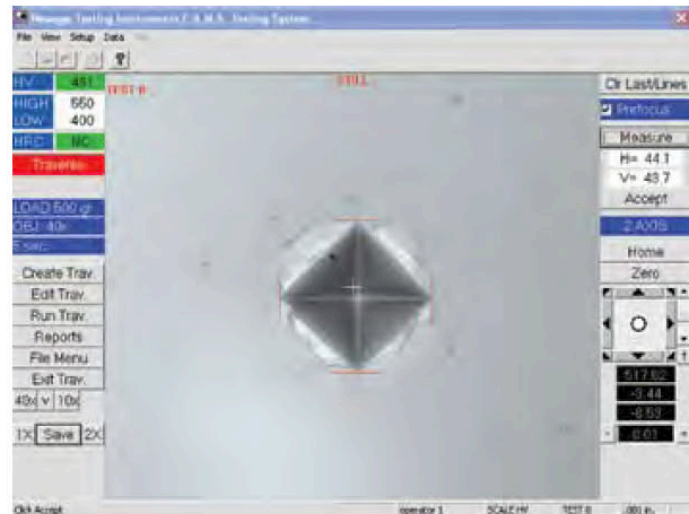
TRAVERSE ROUTINES CAN BE GENERIC...

Operator can create several straightforward traverse routines to handle most of your basic testing requirements. The data can be stored in separate files for each type of part or all processed together. But even on your basic routines, all the C.A.M.S. features of prompting, reporting, commenting, positioning, and focusing still apply automatically.

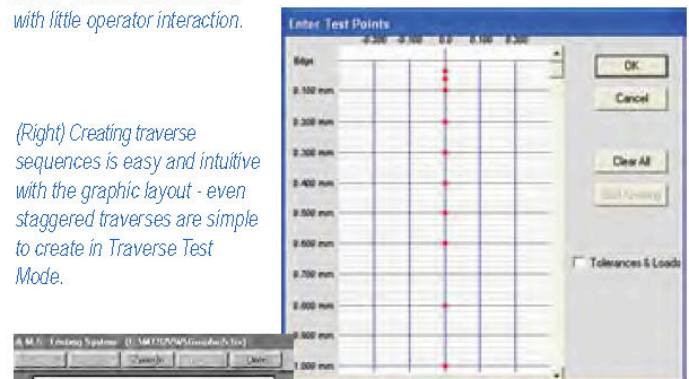
OR HIGHLY CUSTOMIZED.

Any existing traverse can be altered to add more features. Or a new traverse can be created from scratch. An unlimited number of standard and optional traverse procedures can be created, each with its own data. These procedures will provide greater value for customers, allow technicians to make the most of their time, or let your operations perform more consistently and profitably.

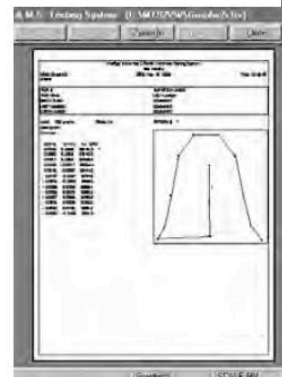
- Run traverses with operator-controlled or automatic measurements, or automatic measurements with manual override capability.
- Run traverses using a preview of the test positions, or run a review of tests afterwards and optionally correcting test results.
- Make straight traverses, staggered traverses, bidirectional weld traverses, or a graphic layout of the face of a test sample, etc.
- Traverses can be created with different test variables on any individual test, such as changing the load, the lens objective, tolerance (or add an audible alarm for out of tolerance conditions), and/or change the virtual image resolution.
- Add multiple core tests, extra surface tests, and multiple effective-case-depth hardness values - all with their own tolerance values.
- Up to 24 traverses routines can be created as part of a single procedure, with each individual routine customized differently if desired.
- Descriptive information input and/or commenting capabilities are available throughout the test cycle.



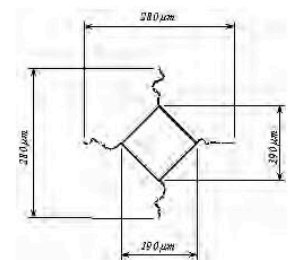
(Above) The main screen provides all the controls the operator needs to make a test in Single Point Test Mode or a traverse in Traverse Test Mode. Traverses can be run with little operator interaction.



(Right) Creating traverse sequences is easy and intuitive with the graphic layout - even staggered traverses are simple to create in Traverse Test Mode.

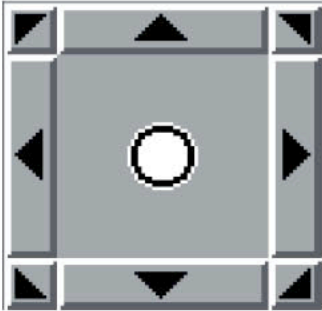


(Above) The Graphic Test Mode provides the ability to test anywhere on a sample and see the results placed in position.



(Above) Many optional test modes are available, like crack length measurement, dual-direction weld traverses, virtual measurement tool, and image analysis.

EXAMPLE 2: ON-SCREEN NAVIGATION



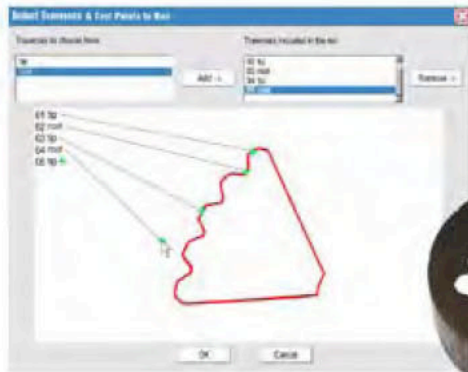
(Above) Even using the basic navigation operators can move anywhere for any type of operation.

NAVIGATION CAN BE SIMPLE...

C.A.M.S. operators frequently comment on the exceptional user-friendliness of the system. The on-screen navigation for systems with motorized X/Y tables is a good example. The arrow buttons are a simple, universal navigation mode that you can use to move anywhere over the sample for any type of operation. Push a button and the view moves in that direction over the surface of the sample. You can select to move in smaller or larger steps. Even complicated automatic traverse test routines can be exceptionally simple, since you don't even need to move the table. Its automatic!

OR SOPHISTICATED.

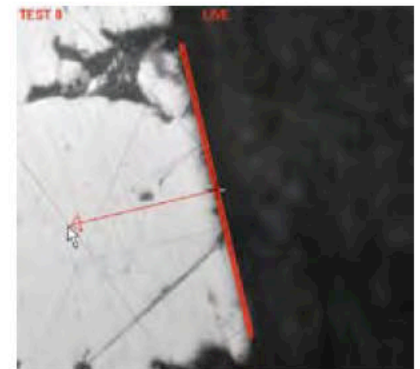
Use the "Right Click" feature to instantly move to a location to the center of the screen. Or using another keystroke or mouse-click combination, move in any direction, by any increment. You can also install a joystick or use the standard built-in virtual joystick. After creating traverse sequences the system can automatically make and measure tests, preview test positions in a "dry-run", or double-check and optionally make retests on a completed traverse. For applications with multiple traverses, a mapping feature provides an overview of the sample and the ability to "pre-locate" the traverse starting points



(Left) The mapping feature provides an overview of the sample so a user can position traverses in a few seconds.



(Right) The traverse direction is easily oriented to the test surface at the beginning of each traverse.



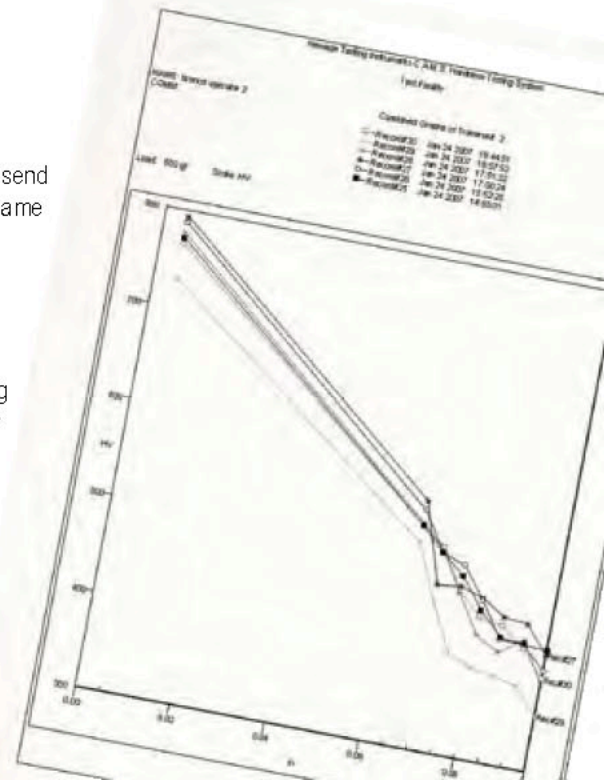
EXAMPLE 3: REPORTING FEATURES

STANDARD REPORTS CAN BE AUTOMATIC...

After each traverse procedure, the standard graph and data are previewed and you can select to send it to the printer. If the procedure included multiple traverses then they are all overlaid on the same graph and individually identified.

OR A COMPOSITE PICTURE OVERLAYING MANY TRAVERSES.

A large variety of reports can be viewed or printed - all designed specifically for hardness testing and traverse applications. You can choose to overlay traverses between multiple samples, overlay multiple traverse setups on individual parts, display multiple case depths, etc. In addition to descriptive information added at the beginning of each traverse, all operator comments can be printed. Test-result scale conversions are also printed. And all reports can show your company name or your customer's company name at the top. At right is a printout showing overlaid traverse graphs, data, and root values.

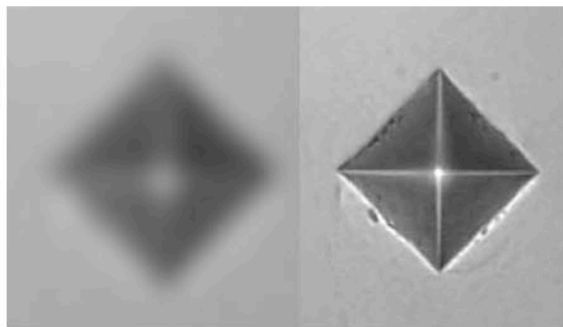


ACCURATE. CONSISTENT. REPEATABLE. IDEAL FOR A WIDE RANGE OF CONDITIONS AND ENVIRONMENTS.

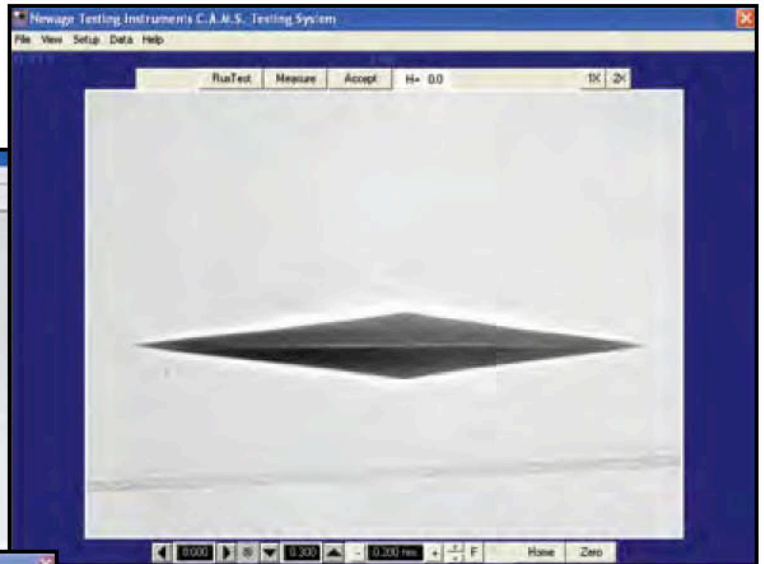
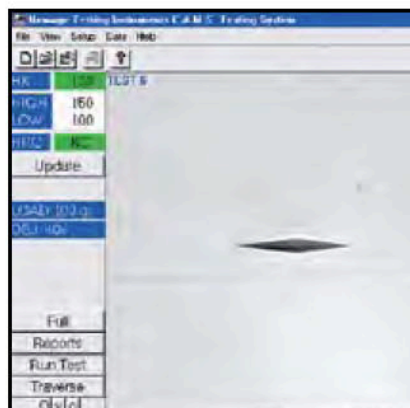
Achieving good accuracy and repeatability are more complex than simply obtaining good results on perfectly produced test blocks using a technician at a heightened level of attention. The C.A.M.S. system can operate exceptionally well on a variety of test surface conditions, and with the range of surface leveling and rounding at the edge of a sample, that is typically encountered on mounted test samples.

One significant advantage of the C.A.M.S. systems is its lack of contrast dependence. Shading correction and other techniques for edge detection in different surface and lighting conditions are not required by C.A.M.S. Successfully test darker and rough surfaces every time, all the time.

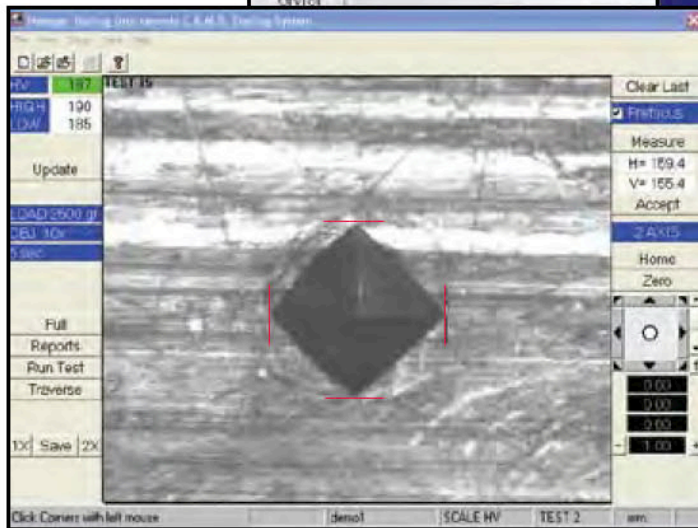
Another factor that commonly affects test results is the focus. Even slightly out-of-focus indentations greatly affect measurements. Newage has settings for a single (narrow) and dual (wide and narrow) range of focusing so testing is as fast as possible. Uneven surfaces can be easily accommodated.



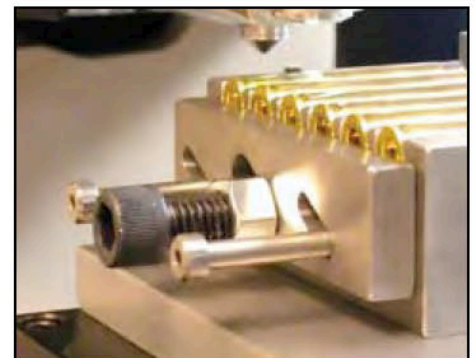
(Left) Focusing issues are a major cause of inaccuracy. C.A.M.S. is exceptionally quick and accurate at making automatic focus adjustments with a direct-drive system with 0.5µ resolution - compared to belt drives on some competitive systems. The automatic focus system can be set for a narrow or wide range of focus. Additionally, focusing can be performed manually or automatically. Or, automatic focus can be initiated manually on specific tests.



(Above) The virtual lens feature enables the operator to view a very small indentation at up to 4x greater resolution for better measurement. Additionally, this feature can be setup to occur automatically on any individual test in a traverse so the system will get better results when using surface tests at small loads. Operators may also capture the image of the indentation as displayed on the monitor and save to a file along with an overlaid display of the test result.



(Right) Due to the unique capability of the C.A.M.S. system to make measurements on darker and a less smooth test surface, it has frequently been used in difficult applications such as the high volume automatic testing system for brass bullet cases. (screen capture seen above)



SIMPLE OPERATION. SERVICE AND SUPPORT YOU CAN COUNT ON.



(Above) The motorized positioning tables are built specifically for hardness testing using optical encoders with 0.5 micron resolution. In addition to the fine positioning over long ranges, the optical encoders enable a positioning system that is much less subject to positioning error due to frictional wear on the screws - a factor which is accentuated in heavier multi-sample systems.

The C.A.M.S. system is unique among automatic-traverse microhardness systems. It is the only auto-traverse system built from the ground up for hardness testing - as opposed to being an image analysis machine which also does microhardness. The software is well adapted, having been developed over a period of time, with many enhancements based on customer feedback.

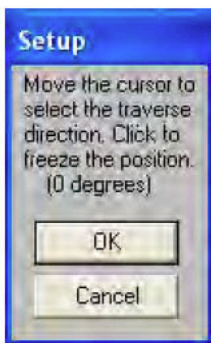
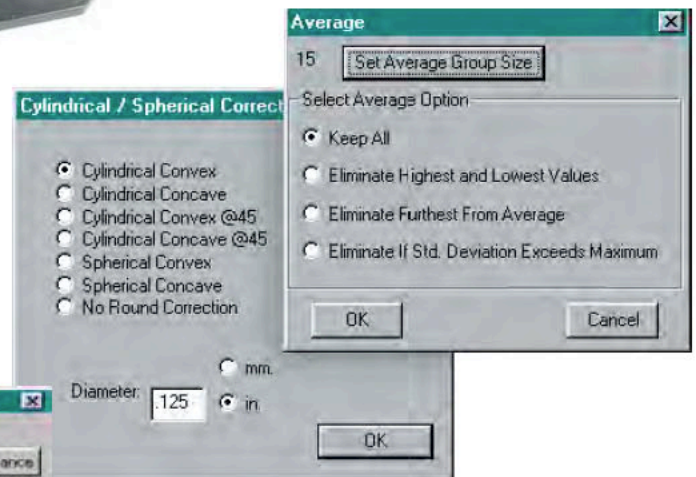
Plus, the software is completely written in-house. Changes and modifications can be easily accommodated. Technical support is fast and more substantial. Consider it software insurance - your company is never subject to a second layer of vendor problems.

Operators do not need a lot of training, since many features are automatic and operators are prompted with instructions at each step while running a traverse. Also, all operations are covered both in the software Help files and in the operation manual.

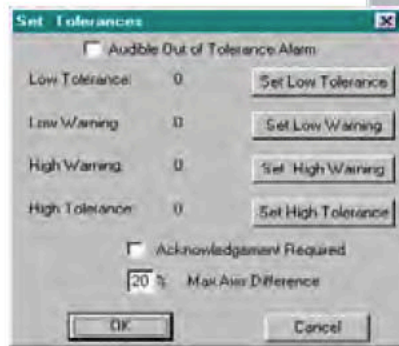


(Left) Newage's standard sample mount is easy to use. The entire self leveling fixture is designed so that it can easily be removed in order to mount a new sample and quickly be reset into its precise position on the tester.

Many standard and optional functions (such as round correction, averaging, scale conversion of the test results) are designed specifically for microhardness testing by hardness testing specialists.



Operators can assign tolerance values, warning values, alarms, and/or operator prompts to the test results, each depending on the test result.



Operator prompts assist operators during traverse operation. Each step in the process of creating or performing a traverse is prompted. Additionally, the operating instructions are available through the help menu.

OTHER SYSTEMS FOR MICRO/MACROHARDNESS, WELD TRAVERSE & CASE DEPTH ANALYSIS



MACRO VICKERS SYSTEMS

Several models of Vickers macrohardness testers are available in standard and semi-custom models. The model seen in the photo above is a semi-custom unit with a fixed load and custom fixture with manual positioning.



AUTOMATIC JOMINY

Newage has manual and automatic Jominy testers in single or multi-sample (above) configurations with quick change fixtures for testing multiple sides and software to perform all the plotting automatically.



ROCKWELL WELD TRAVERSE

Newage has produced weld traverse units in Micro and Macro Vickers, Micro Rockwell (MT90) and Rockwell scales. The Rockwell unit above tests welded rails for railroads using the Rockwell scale for less surface preparation together with the unique magnetic-base fixture.



TOTAL CASE DEPTH

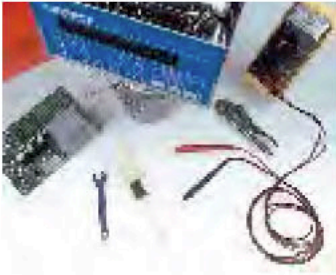
Newage makes a computerized scanner that can perform total case depth tests. The computer-based scanners operate in a fashion similar to the C.A.M.S. system but use a video-based scanhead.



MT90 CASE DEPTH

The MT90 is widely used by major companies around the US. Its application is mostly for high-volume case-depth traverse applications. The tester makes a Rockwell-type test using a load in the Microhardness range and a small size Rockwell-type indenter. The MT90 is the fastest and best system when exclusively performing case depth analysis.

SALES, SERVICE AND SUPPORT



Newage Testing Instruments' sales and service staff and our associates have the capability to support hardness testing needs anywhere in the world.

Newage Testing Instruments is accredited to ISO Guide 17025 for hardness testing calibrations.

We provide a loaner/rental program for some models (subject to availability) to keep our customers in operation while we service your equipment.



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