



## Hardness Testing Systems

# LECO Hardness Testing Systems

## One is Right for You.

LECO offers a wide selection of hardness testing systems to match any application or budget. Choose from manual and automatic model configurations for Microindentation, Macro-Vickers, Multi-Vickers or Rockwell-type testing. Whatever your needs, our sales engineers can help find the hardness testing system that is right for you.

## Advanced features provide you with greater convenience and efficiency.

- LM248AT model features a unique dual indenter turret that provides Knoop and Vickers on a single tester—all with a single touch
- Accurate and repeatable load cell Rockwell-type tester (LCR-500)
- Select loads and create your own Rockwell-type test (LCR-500)
- Our Optical Service Department is A2LA accredited and available to calibrate your Microindentation, Macro-Vickers, or Rockwell-type testers
- Light-load Brinell tests available on LV800/LCR-500 models\*
- Precision dual-leafspring indenter supports provide ruggedness while ensuring a consistent indentation placement (LM- and LV-Series)
- New LMV-50V features Multi-Vickers dual-load cell technology

*\*LCR-500 requires measuring device for Brinell*

## Microindentation and Macro-Vickers Testing

### LM-SERIES

LECO's advanced Microindentation Testing Systems help you meet today's quality standards, as well as the challenges tomorrow's new materials present.

#### LM100-Series

- Economical solution for low volume labs
- Manual measuring eyepiece
- Straightforward operation
- Expand microindentation capabilities by adding LECO's ConfiDent™2 Video Measuring System



#### LM300-Series

- Durable membrane control panel with digital display
- Digital measuring eyepiece
- Equipped with simple printing and data transfer capabilities





### Image Quality (All LM Models)

Fixed aperture diaphragm, a centerable light source, and available interchangeable filters provide metallograph quality illumination.

All LM models can be upgraded for various levels of automation with optional accessories such as printing, video measuring, automatic stages, and automatic test and measuring.

### Video Capabilities (All Models)

Built-in video port/video port adapter included.

### LM248AT

Automatic turret accommodates up to 4 objectives. 10X and 50X objectives are standard. Objectives ranging from 2.5X to 100X are available as options. Knoop and Vickers indenters are standard.

### LM100/300/800AT

Automatic turret accommodates up to 3 objectives. 10X and 50X objectives are standard. Objectives ranging from 2.5X to 100X are available as options. Available with Knoop or Vickers.

### Load Ranges

LM test load ranges from 1 to 2000 gf, available in different configurations.



Color Touch-Panel

### Advanced Color Touch-Panel Display (LM800/248)

All operating parameters are easily accessible with the touch of a finger. The display is easy to read, easy-to-use, and reliable.

### Hardness Conversion

Hardness conversion scales are conveniently displayed on the operation panel for you, in compliance with ASTM (E-140) and SAE (J-417b).

### Quick and Easy Auto-Turret Test Sequence (All AT Models)

After focusing, simply press the START button and the turret automatically positions the indenter, runs the test, and returns to the objective. You get more precise centering since the auto-turret returns to the same spot every time without ever being touched by the operator.

### Fracture Toughness Value (Kc) (LM800/248-Series)

Method JIS R167/IF comes standard and allows you to find the fracture toughness evaluation of fine ceramics or other hard-faced materials.



LM800-Series

[Refer to the LM100/300 Series Specification Sheet for complete product information and available configurations \(form no. 209-094-001\).](#)

[Refer to the LM800 Series Specification Sheet for complete product information and available configurations \(form no. 209-094-009\).](#)

## LV-SERIES

The LV-Series Testing Systems offer you the advantage of testing materials that range from extremely soft to ultra hard. Models feature varying degrees of automation to suit the needs of any materials testing lab.



### Video Capabilities (All Models)

Built-in video port/video port adapter included.

### LV-Series

All LV models accommodate up to 3 objectives. Standard models (1 to 50 Kgf) come with a 10X objective. Light load models (0.3 to 30 Kgf) come with 10X and 20X objectives.



### Color Touch-Panel

### Load Ranges

LV test load ranges from 1 to 50 Kgf or 0.3 Kgf to 30 Kgf.

### Automatic Lamp Control (LV800)

During sample loading, the light automatically shuts off, extending the life of the bulb.

### Image Quality (All LV Models)

Fixed aperture diaphragm, a centerable light source, and available interchangeable filters provide metallograph quality illumination.

All LV models can be upgraded for various levels of automation with optional accessories such as printing, video measuring, automatic stages, and automatic test and measuring.

### Light-Load Brinell Testing (LV800\*)

The Brinell Hardness Test Parameter comes standard on the CPU with the results (HB) displayed on the easy-to-use touch panel.

*\*Custom weight-set and optional carbide ball indenter required.*

*Refer to the LV-Series Specification Sheet for complete product information and available configurations (form no. 209-094-002).*



**LV800-Series**

# Multi-Vickers Testing

## LMV-50V

The LMV-50V is a fully automated micro/macro hardness testing system capable of performing Vickers/Knoop/Brinell (light load) testing and fracture toughness.

- Two Load Cells for Better Repeatability
- Wide Load Range—50 g to 50 Kgf
- Customizable Load Ranges



### Automatic Turret Head

Automatic turret accommodates up to 3 objectives. 10X and 50X objectives are standard. Objectives ranging from 2.5X to 100X are available as options. Available with Knoop or Vickers.



### Easy-to-Use LCD Screen

Simply select the desired load on the touch screen, and the LMV-50V does the rest.

### Ideal for Research Applications

Create a customized test using the free load option.

### Fully Automatic

With no knobs to turn for changing loads, the chances of operator error are virtually eliminated. Select the desired load on the touch screen, and the LMV-50V does the rest.

### Optional Test Methods

Choice of Vickers, Knoop, Light Load Brinell\*, and Fracture Toughness.

\*Optional carbide ball indenter required.

### Video Capabilities (All Models)

Built-in video port/video port adapter included.



Color Touch-Panel

LMV-50V

Refer to the Multi-Vickers Specification Sheet for complete product information and available configurations (form no. 209-094-011).

# Rockwell-Type Testing

## LR-SERIES

LR-Series Rockwell-Type Testing Systems are built to handle your high-volume workloads without sacrificing accuracy or repeatability. Choose from a variety of models, including analog, digital, and twin testers. Light-load Brinell and free loads available on LCR-500.

### User-Friendly Operation Panel (LCR-500)

Test conditions such as loading speed and conversion scale can be easily set using the durable touch panel. Operator simply raises the test piece to within 8 mm of the indenter and presses START to begin test.

### OK/NG Indicators (All Models)

Set your upper and lower limits quickly and easily with the help of convenient OK/NG indicators.

### Hardness Conversion

Hardness conversion scales are conveniently displayed on the operation panel for you, in compliance with ASTM (E-140) and SAE (J-417b).

### Standard RS-232 Output

Both CENTRONICS and RS-232 output (for computer or printer) come standard.



**LCR-500**

**LR300TD**



### Automatic Start Loading (LR100/300 Digital Models)

In the AUTO measuring mode, the major load is automatically applied once the minor load has been set. The automatic load application will not start if the minor load range is exceeded. Manual start is also available.

### Small Footprint

The compact design of these Rockwell-type testers fits easily into any lab.

- Dead load weights
- Conversions on hardness scales
- Digital display
- Standard RS-232 outputs

Refer to the LCR-500 flyer for complete product information and available configurations (form no. 209-142).

Refer to the LR-Series Specification Sheet for complete product information and available configurations (form no. 209-094-003).

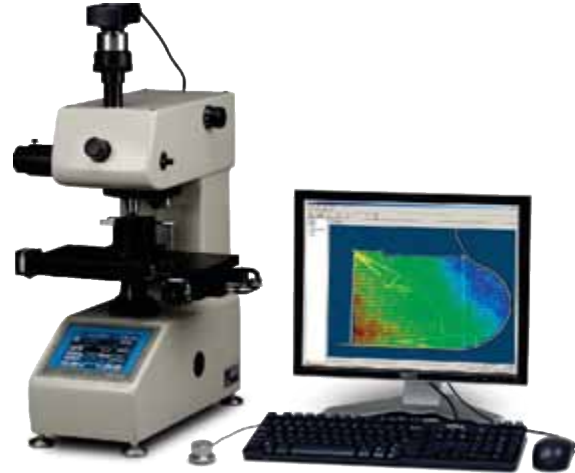
# Automated Hardness Testing

## AMH43 Automatic Hardness Testing System

The AMH43 supports both microindentation and Macro-Vickers hardness testing in fully automatic and semi-automatic configurations for greater precision, accuracy, and efficiency. For microindentation hardness testing, the LM-Series performs indentations from 1 gf to 2000 gf with Vickers, Knoop, or dual indenters. The LV-Series can perform Macro-Vickers indentations from 1 kgf to 50 kgf, or from 0.3 kgf to 30 kgf. The LMV-50V is a fully automatic multi-Vickers Hardness Testing system featuring Load Cell technology, capable of performing indentations from 50 g to 50 kg.

- Automated hardness testing for time-saving convenience
- Unique patented PANOPTIC method for vivid sample reconstruction
- Advanced analysis modules to meet any hardness testing requirement
- Measures impressions of various surface conditions, including scratched or unevenly illuminated

*\*U.S. Patents 6,996,264; 7,139,422. Other patents pending.*



## Accessories and Options



### Confident2™ PC Measuring System

Designed exclusively for measuring indentations, the Confident2 Digital Camera PC Measuring System can be easily retrofitted to your current microindentation tester. Comfortably view the indentation on screen and use the computer-generated filar lines to precisely measure.

### Vibration Isolation Tables

To eliminate errors caused by unwanted vibrations, check out one of our new Isolation Tables for your hardness testing system. Consult your LECO sales engineer for the most up-to-date product information and pricing.



## LECO Optical Service Program



**Routine maintenance extends the life of your instruments.**

### Service

Available in your plant or lab, or at our shop in St. Joseph, Michigan.

### Repair

Complete repair and overhaul of your instrument by factory-trained service specialists.

### Calibrations

Calibrations are A2LA accredited in the U.S.A. and Canada (certificate #1845.01); copies available at [leco.com](http://leco.com) or call 269-982-2385.

### Technical Support

Call LECO Optical Service for technical assistance (269-982-2385).

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Delivering the Right Results

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