

# *Corporate Product Overview*



**LECO**  
EMPOWERING RESULTS

# Inorganic

# Spectroscopy

Carbon | Sulfur

Oxygen | Nitrogen | Hydrogen

Carbon | Water

Hydrogen

Glow Discharge AES



## 844/744 Series

- Quick, accurate carbon and sulfur determination by combustion infrared detection
- Expanded range and increased precision for the most demanding applications
- Calibration, analysis, evaluation, and diagnostic functions accessible via user-friendly software
- Rapid sample combustion with our high-efficiency induction furnaces
- Autocleaner available
- Compatible with SmartLine® Remote Diagnostics
- Optional 10- and 60-position autoloaders
- Cornerstone® Mobile option provides access to data, plots, and instrument status from your smartphone, tablet, or desktop computer

## 836/736 Series

- Oxygen, nitrogen, and hydrogen determination by inert gas fusion
- Fast, simultaneous measurement of oxygen, nitrogen, and hydrogen
- State-of-the-art infrared and thermal conductivity detectors with no moving parts and no manual adjustments
- EN variant for large sample applications like uranium oxide and aluminum; Si variant for the analysis of low level oxygen in silicon wafer samples and other materials
- Optional 20-position autoloader and autocleaner available
- Compatible with SmartLine Remote Diagnostics
- Cornerstone Mobile option provides access to data, plots, and instrument status from your smartphone, tablet, or desktop computer

## RC612

- Fast, reliable carbon and water determination for a wide variety of organic and inorganic materials
- State-of-the-art furnace control system allows temperature ramping from ambient to 1100 °C
- High-efficiency afterburner ensures complete combustion of organic compounds when ramping
- Simplified furnace design eases maintenance and increases safety
- Increased flexibility by reacting in an inert atmosphere or combusting in an oxidizing atmosphere
- Optional non-sequential 50-sample autoloader available
- Compatible with SmartLine Remote Diagnostics

## DH603

- Residual and diffusible hydrogen determination by hot extraction
- Optional diffusible sample piercer
- State-of-the-art thermal conductivity detector with no moving parts and no manual adjustments
- Innovative chassis architecture improves reliability and serviceability
- Larger combustion tube to accommodate bigger samples
- Compatible with SmartLine Remote Diagnostics

## Glow Discharge Atomic Emission Spectrometers

- Bulk elemental analysis only, or bulk analysis and compositional depth profiling (CDP) models available
- Spectral range from 120 to 850 nm (configuration dependent)
- Continuous profile of concentration/thickness
- Wide dynamic range with concentrations from ppm to 100% by weight
- Short analysis time (within minutes)
- Choice of RF or DC lamps for both conductive and non-conductive samples
- Easy-to-use software
- Compatible with SmartLine Remote Diagnostics

# Separation Science

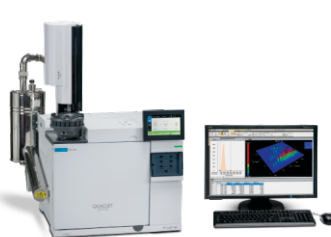
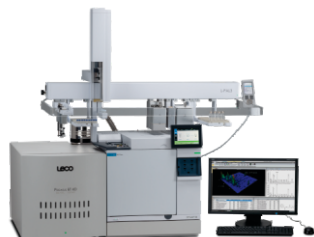
GC-MS

GCxGC-MS

GCxGC

High Resolution GC-MS

High Resolution GCxGC-MS



## Pegasus® BT GC-TOFMS

- Industry-leading sensitivity helps you find and quantify an unlimited number of analytes, while proprietary deconvolution algorithms yield clean, high quality spectra
- A complete historical record of all components for each sample is retained for future data mining
- The tried-and-tested reliability and durability of our Pegasus brand in a convenient benchtop unit
- StayClean® ion source eliminates the need for source cleaning

## Pegasus BT 4D GCxGC-TOFMS

- Enhanced sensitivity by coupling our benchtop Pegasus BT with our high performance GCxGC thermal modulation system
- Ability to interrogate challenging samples where the best sensitivity is needed
- Unique and powerful ChromaTOF® brand software simplifies quantitation and analyte identification with features such as NonTarget Deconvolution® (NTD®), Target Analyte Find, library searches, and more
- StayClean ion source eliminates the need for source cleaning
- ChromaTOF Tile software allows the easy and quick statistical comparison of groups of GCxGC TOF samples

## QuadJet™ SD

- Enhanced separating power for complex sample analysis
- Easy-to-use ChromaTOF-based software provides acquisition processing and reporting functionality within a single package
- Classification software feature simplifies component identification
- Available cryogen-free modulator eliminates the need for LN<sub>2</sub> dewars

## Pegasus GC-HRT+ GC-TOFMS

- The highest performance TOF mass spectrometer for the GC-MS market
- Folded Flight Path® (FFP®) technology allows users to achieve resolutions of up to 50,000
- Employs ChromaTOF software with automated High Resolution Deconvolution® (HRD®) and formula generation for seamless identification of unknowns, plus compatibility with standard GC-MS libraries
- Spectral Analysis Toolkit harnesses the power of Mass Defect, Van Krevlen, and RDBE plots to take your unknown analysis to a new level
- 1 ppm mass accuracy identifies unique molecular formula
- Encoded Frequent Pushing® (EFP®) contributes to increased sensitivity, expanded dynamic range, and much more
- The new Multi-Mode Source™ (MMS™) allows users to easily produce and compare aligned data from multiple modes of ionization (EI, PCI, and ECNI)

## Pegasus GC-HRT+ 4D GCxGC-TOFMS

- Combining the highest performance GCxGC and TOF on the market gives users an unprecedented ability to interrogate complex samples
- Using the Identification Grading System™ (IGS™), identify components with the ultimate confidence
- With mass accuracies of 1 ppm and peak capacities at least two times greater than anywhere else in the marketplace
- The industry's most established GCxGC systems; thermal modulation with liquid nitrogen or cryogen-free versions
- ChromaTOF Tile software allows the easy and quick statistical comparison of groups of GCxGC TOF samples
- The new Multi-Mode Source (MMS) allows users to easily produce and compare aligned data from multiple modes of ionization (EI, PCI, and ECNI)
- Integrated software platform acquires data, controls all hardware, and analyzes and reports results with a high level of automation; tailored to get the most out of HR data

# Metallography

## Sectioning



### SX100M Series

- Radial arm for manual sectioning at user-friendly working height
- Integrated 6.6 gallon recirculating tank
- Sloped floor for efficient coolant flow and minimal debris build-up
- Convenient, easy-to-operate control panel
- Electronic mechanical braking system

### MSX Series

- Manual control and automatic oscillation or pulse sectioning
- Flexible model configurations with blades up to 17 in (432 mm)
- Optional integrated X- and Y-tables for parallel sections
- Optional filter bag kits for longer coolant operating life
- Side access ports to cut variable-length specimens
- Rugged steel design
- Recirculation tank included

### MX Series

- Fully automatic mounting press with single- and dual-mounts in a variety of mold sizes
- Intuitive, easy-to-use touchscreen interface
- Simple, solid-steel closure design is durable, easy to clean, and avoids jamming
- Slim, 8-inch wide profile maximizes lab space
- Optional water recirculator to save water and keep MX units clean

## Mounting



## Grinding | Polishing



### PX400/500

- Intuitive, touch-screen software simplifies your grinding/polishing process
- Spiral bowl design prevents drain clogs
- Up to five programmable metered fluid dispensers to meet every polishing objective
- Rugged components withstand any environment
- Fixed and individual sample method models available



### PX300

- Solid and compact with a durable aluminum frame design
- Manual control of wheel speed, water spigot, and timer
- Water faucet with adjustable flow is flexible for ease of bowl cleaning
- Optional non-motorized head for multiple sample preparation



### BG Series

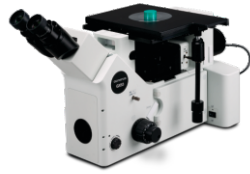
- Coarse grinding
- Wet or dry applications
- Single- or dual-belt models
- Dust Collector and Water Recirculator available

## Optical Equipment



### DSX1000 Digital Microscope

- Combines micro and macro imaging in one versatile and easy to use package
- Capture and measure 3D images from 20 to 7000x magnification
- Powerful software to help capture the best image and create custom reports
- Available with a variety of options and are compatible with IA44/PAX-it™ Image Management software
- Available in the USA and Canada only



### Olympus Optical Microscopes

- Inverted metallographs for production, quality control, and research
- Full range of upright stereo microscopes
- GX-, BX-, SZ-, and SZX-Series models available
- Full range of accessories including filters, reticles, digital cameras, and software
- Available in the USA and Canada only



### VX4 Optical Microscope

- Inverted brightfield metallograph with excellent optics and LED illumination
- Includes manual XY-stage and polarized light evaluation
- Camera port for simple camera integration



### IA44/PAX-it™ Image Management System

- Complete image analysis software with a powerful file archival system
- Search, sort, and organize images according to descriptive fields
- An ideal solution for measuring, archiving, and image analysis of materials
- Optional modules for grain size, nodularity, edge detection, and more



### LM/LV Series

- Micro and Macroindentation, Knoop, and Vickers capabilities
- Analog and digital models
- Touch-screen capability on select models
- Durable design for reliable performance
- Optional auto turret
- All models conform to ASTM specifications



### LR/LCR Series Rockwell-Type

- Superficial & Rockwell scales
- Load Cell technology
- Highly accurate, reliable results
- Dead weight Rockwell-type units available
- Conforms to ASTM specifications



### AMH55 Hardness Testing System

- Cornerstone brand software for increased usability, simplified reporting, and streamlined analysis times
- Unique patented trace function
- Automatically measures impressions with various surface conditions, including scratched, etched, or unevenly illuminated surfaces
- Application-specific modules to expedite testing
- Available in Automatic, Semi-Automatic, and Lite configurations

## Automatic | Manual Hardness Testing

LECO, Cornerstone, SmartLine, Pegasus, ChromaTOF, True Signal Deconvolution, Folded Flight Path, FFP, Encoded Frequent Pushing, EFP, High Resolution Deconvolution, HRD, FLUX, StayClean, Multi-Mode Source, MMS, Identification Grading System, and IGS are registered trademarks of LECO Corporation.

Olympus® is a registered trademark of Olympus Corporation.

PAX-it™ is a trademark of Midwest Information Systems, Inc.

## Calorimetry



### AC600

- Accurate and precise calorific measurements in as little as 5 minutes
- Ergonomic vessel and prep station design for convenient operator handling and ease-of-use
- Meets or exceeds ASTM and ISO requirements
- 6,000 to 15,000 Btu/lb range for 1 gram sample
- Intuitive software
- Compatible with *SmartLine* Remote Diagnostics

## Thermogravimetric Moisture



### TGM800

- High precision, automated thermogravimetric moisture determination, which utilizes a direct method for replacing tedious loss-on-drying techniques
- Measure up to 16 samples at a time with optimized drying time using mass constancy end point recognition
- Intuitive *Cornerstone* brand software with flexible method settings and touch-screen operation
- Precise oven temperature ramping and set point control up to 175 °C
- Remote access through *Cornerstone Mobile* provides access to data, plots, and instrument status from smartphone, tablet, or desktop computer

## Thermogravimetric Analysis



### TGA801

- Automated thermogravimetric analysis batch of up to 19 samples
- Determine multiple constituents ... moisture/ash, organic matter, volatile content, and LOI from a single sample in various organic, inorganic, and synthetic materials
- Optimized analysis time using automatic end point recognition based upon sample mass constancy
- *Cornerstone* brand software with touch-screen interface promotes an ergonomic workspace and optimized workflow
- Remote access through *Cornerstone Mobile* provides access to data, plots, and instrument status from smartphone, tablet, or desktop computer

## Sulfur | Carbon



### 832 Series

- Simple, fast, accurate sulfur/carbon determination in organic materials
- High-efficiency furnace with intelligent control lowers operating costs and optimizes furnace reliability
- Individual wide-range IR detection
- Operator-centered design with touch-screen *Cornerstone* brand software promotes an ergonomic workspace and optimized workflow
- Optional High Temperature (HT) and Dual-Range (DR) 832 models are also available
- *Cornerstone Mobile* option provides access to data, plots, and instrument status notifications from your smartphone, tablet, or desktop computer

## Carbon | Hydrogen | Nitrogen



### 828 Series

- Rapid analysis cycle times as fast as 2.8 minutes with macro sample mass capabilities
- A reduction reagent tube lifetime of 4,000 samples extends instrument uptime and lowers operating costs
- Dual-stage reagent-free furnace with exclusive oxygen furnace enables application versatility using macro sample mass
- *Cornerstone* brand software with touch-screen interface promotes an ergonomic workspace and optimized workflow
- Optional S832 add-on provides independent sulfur determination
- Remote access through *Cornerstone Mobile* provides access to data, plots, and instrument status from smartphone, tablet, or desktop computer
- Complies with ISO, AOAC, AACC, AOCS, and ASBC methods of analysis

## Carbon | Nitrogen | Sulfur



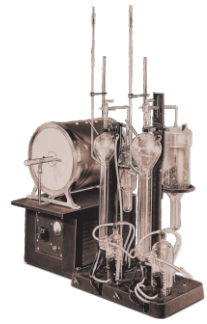
### 928 Series

- Rapid determination of macro sample sizes (up to 3 grams) in as little as 5 minutes
- Extended reagent lifetimes maximize lab efficiency and lowers operating costs
- Rugged design meets the demands of difficult applications
- Operator-centered design with touch-screen *Cornerstone* brand software promotes an ergonomic workspace and optimized workflow
- *Cornerstone Mobile* option provides access to data, plots, and instrument status notifications from your smartphone, tablet, or desktop computer
- Complies with AOAC, AACC, AOCS, and ASBC methods of analysis

# Let Us Empower Your Results.

The one thing all laboratories need to be successful is results they feel confident in. Since 1936, millions of samples worldwide have been analyzed using LECO instruments for elemental analysis, gas chromatography, hardness testing, and more. We work with our customers to find the right solution for the type of sample analysis they are performing, helping them to achieve data that is clear, consistent, and accurate. But our commitment to the customer doesn't end when our instruments are delivered.

LECO is dedicated to enhancing the user experience long after the sale by offering thorough training on our instruments and technology, accessibility to instrument service programs that keep your instruments in top working order, and access to friendly service and support to ensure you are getting the most out of your purchase—support that will empower your laboratory for success.



**1936:** Carl Schultz founds the Laboratory Equipment Company, and introduces the first rapid carbon determinator for the steel industry.



**1973:** LECO introduces the industry's first line of complete solutions for metallographic analysis.



**1979:** The SC-32, the industry's first automated sulfur analyzer, replaces the tedious ESCHA wet chemistry method.



**1997:** The Pegasus<sup>®</sup> GC-TOFMS, one of the first time-of-flight mass spectrometers in the marketplace, is released by LECO.



**2006:** LECO unveils its Global Support Center, a 50,000 square foot service and training facility.



**2012:** LECO opens the Elizabeth S. Warren Technical Centre, dedicated to the research and development of innovative instrumentation and equipment for the separation science product line.



**2016:** LECO celebrates 80 years of innovation by introducing the Pegasus BT, a new benchtop GC-TOFMS.

1936

60's

70's

80's

90's

00's

10's

FUTURE



**1967:** LECO's first international presence is established with the formation of the Export Division in Germany.



**1976:** LECO's first protein determinator, the NP-28, is introduced to the organic and food markets.



**1983:** The TGA Moisture/Ash series is introduced. The Carl E. Schultz Technical Center opens as a state-of-the-art Research and Development center.



**2000:** LECO introduces the TC-600 and CS-600 series, the first instruments of their kind with built-in Windows<sup>®</sup>-based software.



**2011:** Cornerstone<sup>®</sup> software platform is launched, providing faster, more intuitive operation, including touch-screen capabilities, for LECO analytical products.



**2014:** Cornerstone Mobile, an optional remote viewing feature, is introduced, allowing users to view status, data, and plots for select instruments from a smartphone, tablet, or desktop computer.



**2018:** Continued growth and expansion sparks the opening of the new Robert J. Warren Customer Experience Center, a 64,000 sq foot facility with multiple laboratories ideal for customer demonstrations and presentations.