Thermo Scientific DXR3xi Raman Imaging Microscope

Accelerate your work
Visualize your answers

Unlock the power of Raman imaging

Raman imaging evolved

- **Walk-up-and-run** ease of use

- **Visually driven** image acquisition

- **A microscopy-first approach** to spectroscopic analysis

- **Speed to answers** about materials and samples

- **Information in real-time** saves time and increases productivity

- **Expert level performance** over a wide range of sample types

The Thermo Scientific™ DXR3xi Raman Imaging Microscope pushes Raman microscopy to the next level. High performance chemical imaging is now accessible to all, accelerating research for new and experienced users alike. Optimize imaging parameters in real-time to visualize your data faster using the comprehensive Thermo Scientific™ OMNIC™xi imaging software. With its automatic feature recognition and powerful component identification, the DXR3xi Raman Imaging Microscope will transform the way you approach materials analysis.

Interdisciplinary Academic Research Laboratories

- Allows multiple users to focus on their research, not the technique

- Simple operation accommodates users of all skill levels

- Enables rapid progress in the new research directions you want to take

Industrial Research and Product Development

- Designed from the ground up to ensure stable results and confidence in your data

- Intuitive workflow maximizes throughput for the most demanding applications

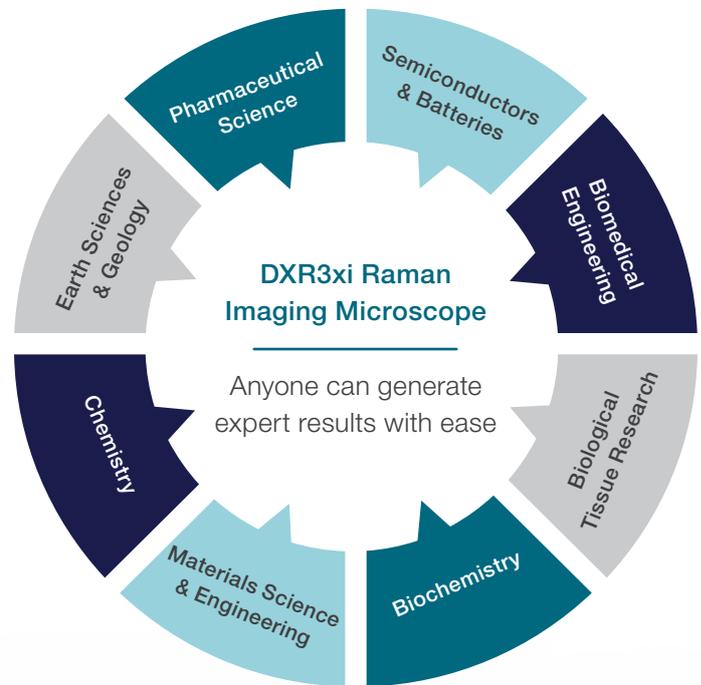- World-class service and support keeps you running around the clock

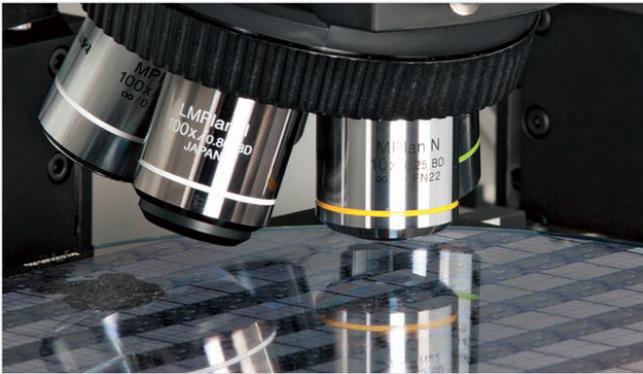# Advance your research without the learning curve

Apply your skills and imagination to advancing scientific research rather than learning the tools to get you there. Whether preparing data for that high-impact publication in a peer-reviewed journal or reaching the market first with your next product, the DXR3xi Raman Imaging Microscope is designed to keep you ahead of the competition.

Accelerate progress across your organization

If your organization shares instrumentation or you must rely on a wide range of tools to conduct your research, you want to obtain results fast, using equipment that has built-in technical expertise. This means having a system that does not require an expert to set up the instrument, collect your data for you, or interpret the results. With the DXR3xi Imaging Microscope, you can use Raman imaging to advance your knowledge and reputation in your own field of work without mastering a new scientific technique. Expertise is built in to let you focus on getting answers. You'll see more users generate more results, faster with the DXR3xi microscope.

DXR3xi Raman Imaging Microscope

Anyone can generate expert results with ease

- Pharmaceutical Science
- Semiconductors & Batteries
- Biomedical Engineering
- Biological Tissue Research
- Biochemistry
- Materials Science & Engineering
- Chemistry
- Earth Sciences & Geology

Expertise designed into the DXR3xi Raman Imaging Microscope

Meaningful results without trial and error

- Sophisticated autofocus that tracks location and manages uneven samples

- Fine laser power control provides the best available tuning between sample and instrument sensitivity

- Automatic backgrounds compensate for natural electronic and optical system conditions and ensure you are looking at pure sample information

Stability, precision, and simplicity

- Visually driven software is intuitive and makes parameter optimization easy

- Autoalignment and calibration ensures scientifically accurate measurements, without tools or manual procedures

- Three-path fine beam autoalignment maintains peak performance and sampling integrity

- Fine, accurate laser power regulation ensures consistent sample excitation over the lifetime of the laser

- Advanced spectrograph design with no moving parts simplifies use and makes the detection system and calibration robust

Adaptability to any application, configurable by any user

- Pre-aligned and lock-in-place components use automatic recognition and stored alignment, allowing any user to reconfigure an instrument in seconds

- Data standardization between excitation laser wavelengths

- Lasers and other components can be interchanged and shared with every instrument in the DXR Raman family

Reveal meaning in seconds, turning data into answers

Leave the hunting, data processing, and guesswork behind. Our unique OMNICxi software has powerful spectroscopic algorithms built-in to enhance image-driven analysis.
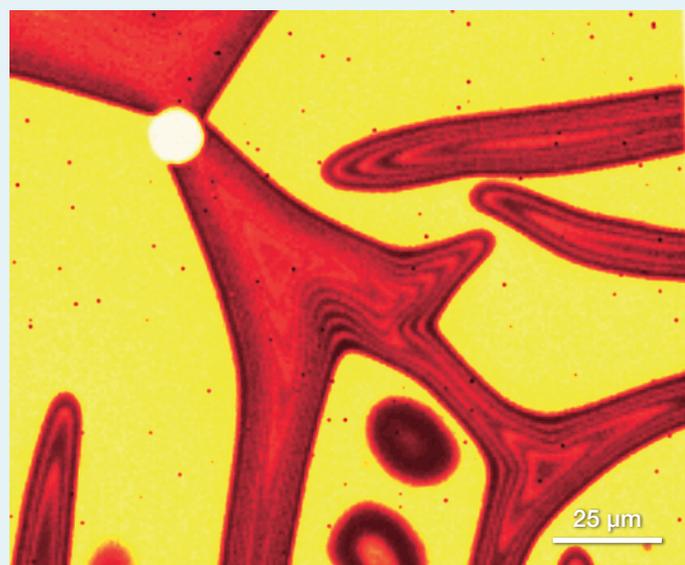
- Automatically transform rich hyperspectral data into meaningful visual representations

- Effortlessly switch between views to highlight subtle differences, identify patterns in your sample, or probe for a specific feature or spectral characteristic

- Focus on the smallest chemical or physical detail to explore unknown features and anomalies

High-spatial resolution image of pain-relief medication visually pinpoints the location and quantity of four principal components with built-in Multivariate Curve Resolution. 5.4 million spectra collected at a rate of 540 spectra per second over an 11 × 11 mm area.
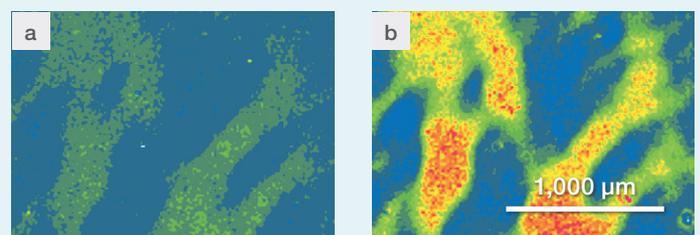
Characterize. Predict.

- Find the hidden answer to your problem quickly with spectral interpretation tools that highlight chemical, structural, and morphological changes

- Develop a detailed understanding of how processing parameters affect the properties of your material

The biaxial stress state induced by deposition of a semiconductor thin film on a lattice mismatched substrate illustrates the interplay between processing and physical properties.
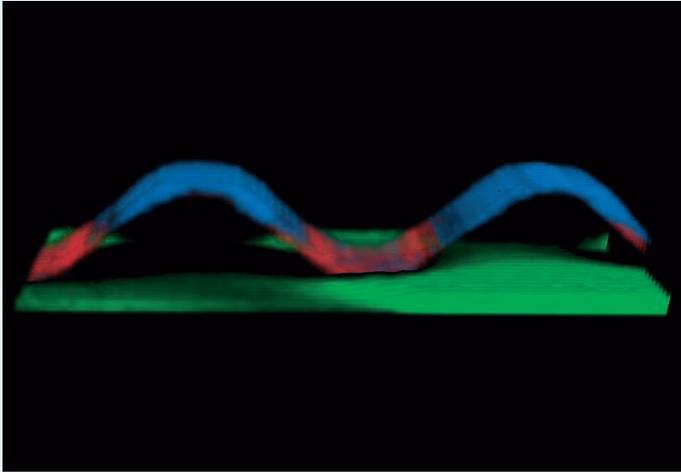
Locate. Identify.

- Statistical processing, including automatic component identification and correlation analysis, enables you to quickly elucidate components, structure, or traits

- Extensive spectral databases provide one-click identification of unknowns without interrupting data collection

Raman spectroscopic image of isotactic polypropylene with depolarized (a) and polarized (b) Raman excitation. Both images show the peak height intensity ratio of the peak at 809 cm^{-1} to the peak at 849 cm^{-1}.

Investigate. Reveal.

- High spectral sensitivity means more spectra in less time, providing a complete picture of your sample in minutes

- Move rapidly from data collection to analysis to communicating your ideas, with confidence
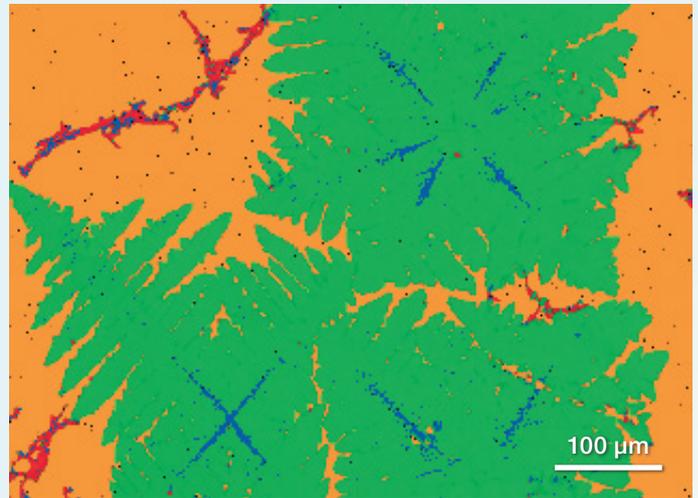

Controlled nano-scale semiconductor architectures is important for a variety of applications including flexible electronics. This is a three dimensional image of a 220 nm thick buckled silicon nanoribbon on a poly(dimethylsiloxane) support.

Confirm. Quantify.

- Quickly characterize uniformity or distribution of unique components to ensure your process is working as expected

- Apply essential metrics to understand size, quantity, or spatial variation – even across the entire sample area

Discover. Explore.

- Minimal sample preparation and real-time imaging lets you learn about your sample as quickly as possible

- Swiftly move between sample locations and explore regions from several millimeters to a few microns, all with a few mouse clicks

100 µm

Evaluate the quality of materials such as graphene films and provide essential feedback for development of production methods. This image shows the structural composition of a graphene film using Raman imaging and comprises over 170,000 spectra in a 188 × 227 micron area.

Capture the smallest details in the big picture

Understanding your sample requires much more than looking at points in isolation. For advanced materials analysis, the relevant details might be extremely small but only found or understood within the context of a larger sample. With the DXR3xi Raman Imaging Microscope, a single sweep of the cursor lets you evaluate samples many times larger than the microscope field of view and with spatial resolution smaller than the laser spot. The result is a seamless, large scale image in full detail without complexity, hardware reconfiguration, or data size limitations.

Our intelligent approach to data collection lets you rapidly explore the entire sampling area and find exactly what you are looking for. The DXR3xi Raman Imaging Microscope reveals visual information with speed and simplicity.

The performance advantage of FINE DETAIL

Sub-micron spatial resolution calls attention to even the smallest features. Ultrafast and adaptive data processing automatically detects variations to extract the detail that only high-resolution imaging can provide.

The agility of RAPID IMAGING

Leveraging an EMCCD camera, the DXR3xi microscope couples speed with real-time data visualization to give you prompt answers. Quickly survey multiple regions of your sample without compromising image quality.
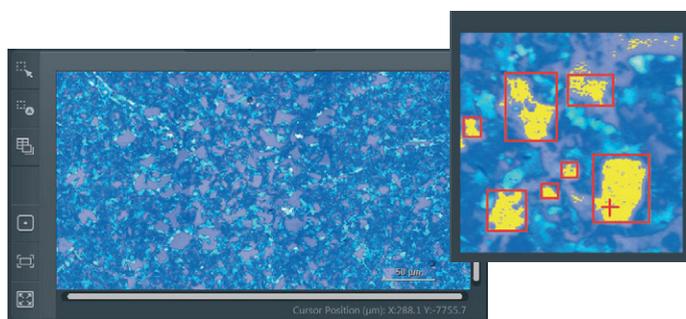
The POWER to look over large areas

Our proprietary data processing platform handles extremely large data sets with unprecedented ease and stability. Powered by closed-loop motion control with impressively large range of travel, the DXR3xi microscope can image macroscale samples to quickly scan for anomalies requiring further study.

Visually driven microscopy, powered by spectroscopy

Inspired by optical, scanning electron, and atomic force microscopy, the DXR3xi Raman Imaging Microscope is driven through simple yet powerful image-centric software.
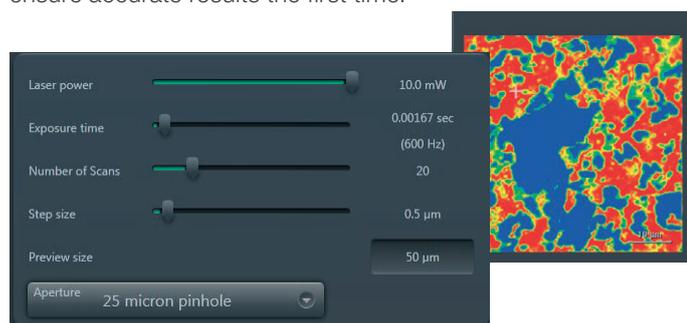
1. Rapid, single-click sample targeting

Quickly identify regions of interest for Raman imaging. Automatically find and target particles, defects, contaminants, and other unique features for detailed chemical analysis. *Spend less time looking and more time understanding.*

Automatic particle and feature targeting helps define analysis regions

2. Optimize settings with intuitive controls

Simple, fast measurement setup with same-screen controls. *Visual feedback from live spectral and chemical displays* ensure accurate results the first time.
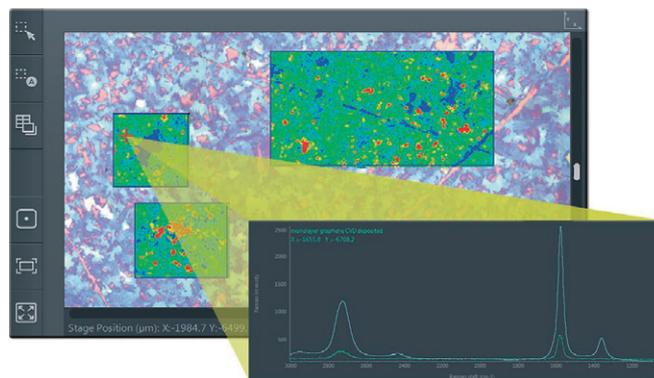

Real-time parameter tuning with immediate visual display

The standard DXR3xi Raman Imaging Microscope is a Class 1 laser product. Class 3B when fiber optic interface is installed and with some specialized accessories.

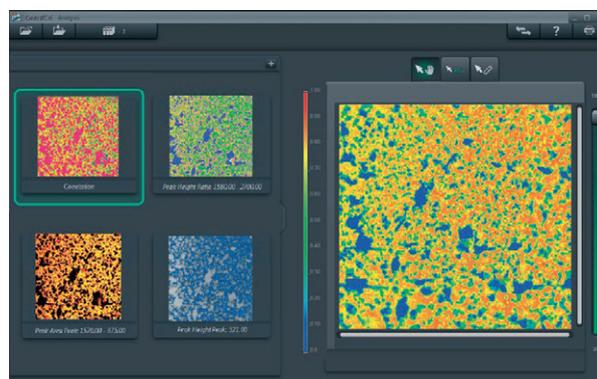## 3. Prioritize multiple regions of interest and run

Rapidly extend your analysis to larger areas and obtain a complete picture of your sample. Use real-time component and domain identification to focus on the features that matter the most. *Scan more regions faster* to drive your work forward in record time.

Live spectral search and component identification aids multiple region selection

4. Information-rich images reveal a multitude of material characteristics

Effortlessly image chemical and physical traits of your material. *Images are easily navigated and interpreted*, from a global to a microscopic view. Present your research with stunning images that convey meaningful insights and discoveries.

Analysis window displaying multiple material traits (Correlation, Peak Height Ratio, Peak Area, Peak Height) in independent images

To learn more or request a demo visit **thermofisher.com/raman**

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