



Thermo Scientific DXR3 SmartRaman Spectrometer

Dependable Raman analysis

The Raman spectroscopy solution

Take advantage of the ease of sample preparation offered by Raman spectroscopy without becoming an expert in the technology. Incorporating patented features to maintain peak performance and deliver answers routinely and reliably, the Thermo Scientific™ DXR3 SmartRaman Spectrometer was built to meet the needs of the multi-purpose analytical lab.

The DXR3 SmartRaman Spectrometer and your applications

One of the most versatile characteristics of Raman spectroscopy is its ease of sampling. With minimal preparation, samples are readily analyzed through glass and plastic packaging.

The DXR3 SmartRaman is a true walk-up-and-run Raman spectrometer designed as an analytical tool to give you all the benefits of Raman spectroscopy.

Analyze a wide variety of samples, including:

- Liquids in clear and brown glass bottles
- Samples in blister-packs
- Powders, liquids, slurries in multi-well plates
- Tablets
- Samples in tubes, vials, cuvettes
- Powders in plastic packages

Typical applications for the DXR3 SmartRaman:

- QA/QC
- Analytical methods development
- R&D
- Process development
- Routine analysis
- Teaching and chemical education

Typical industries:

- Forensics
- Academic research
- Dyes and chemicals
- Polymers
- Food and packaging
- Pharmaceuticals

The DXR3 SmartRaman Spectrometer

The DXR3 SmartRaman Spectrometer is designed for bulk sample analysis in busy multi-purpose analytical labs where the users are looking for reproducible and accurate results from a dependable, low maintenance instrument.

- Easily obtained results
- Excellent sensitivity
- Full spectral range
- Interchangeable Smart sampling accessories
- Wide variety of sample formats
- Low maintenance
- Expandable



Sampling versatility – Smart Accessories for all your needs

Quickly adapt to different sample formats with accessories that are designed for the full range of sample types. The DXR3 SmartRaman sampling accessories use pinned-in-place technology to attach to the DXR3 SmartRaman base, where they are automatically recognized by the Thermo Scientific™ OMNIC™ Software using Smart technology.

The Universal Platform Sampling accessory

The Universal Platform Sampling accessory accepts these four pinned-in-place smart toolheads, each designed to accommodate a particular sample format.



The Array Autosampler automates analysis of multi-well plates and other samples in array formats.



The Bottle Holder for analyzing the contents of standard bottles.



With its iris format, the Tablet Holder accepts tablets in a range of sizes.



The Universal Plate for samples such as plastic bags and glass vials.

Remote sampling

For samples too large to fit in the sample compartment, or for remote sampling requirements, the DXR3 SmartRaman Spectrometer has the capability to accept optional fiber-optic probes.

The 180 Degree Sampling accessory

For labs that handle samples in a variety of formats, the 180 Degree Sampling accessory is the best option. Designed as a simple device to accommodate vials, tubes, powders and other samples, the 180 Degree accessory enables the use of specialty cells, including cryogenic, high-temperature, electrochemical and controlled-humidity chambers.



NMR tube holder for the 180 Degree Sampling accessory kit (left) and Vial holder for the 180 Degree Sampling accessory kit (right).



180 Degree Sampling accessory kit.



Raman spectroscopy for shared academic laboratories

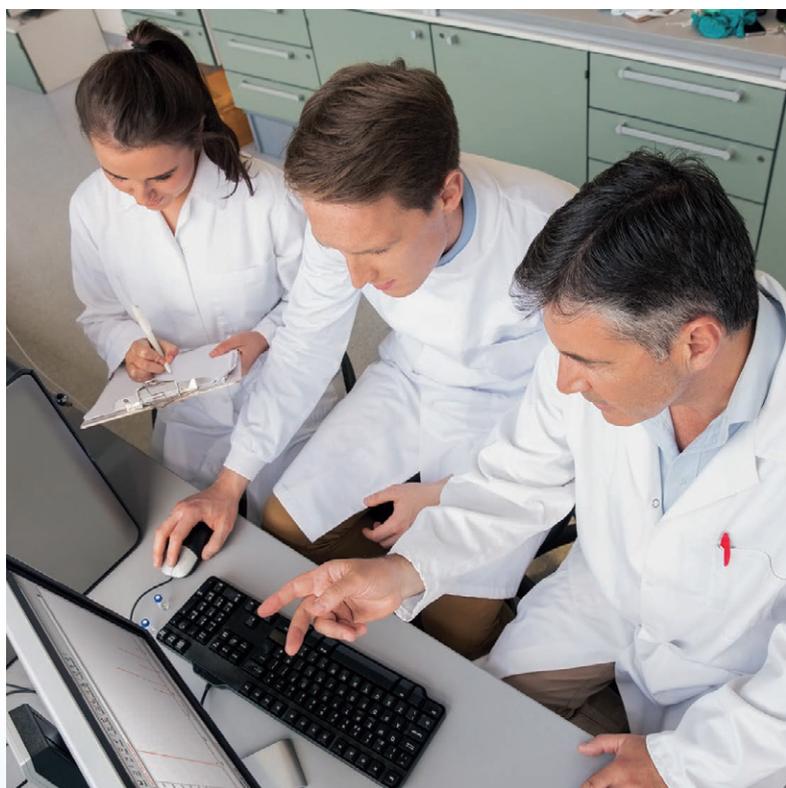
Enhance your academic laboratory instrumentation by providing student easy access to Raman spectroscopy.

Improve interdepartmental research

- Enable various departmental users, from materials engineering to life sciences, geology to pharmaceuticals to collect Raman data
- Increase the value of your departmental research dollar with a flexible instrument Software to suit your needs and help solve your problems

Software to suit your needs and help solve your problems

- Comprehensive OMNIC software suite for full instrument control and data processing
- OMNIC Spectra software for highly-efficient management and processing of spectral data for materials identification
- Extensive Raman libraries and easy-to-use search capabilities
- Thermo Scientific™ TQ Analyst™ with chemometric models for comprehensive data analysis



Raman spectroscopy for pharmaceutical and industrial quality control environments

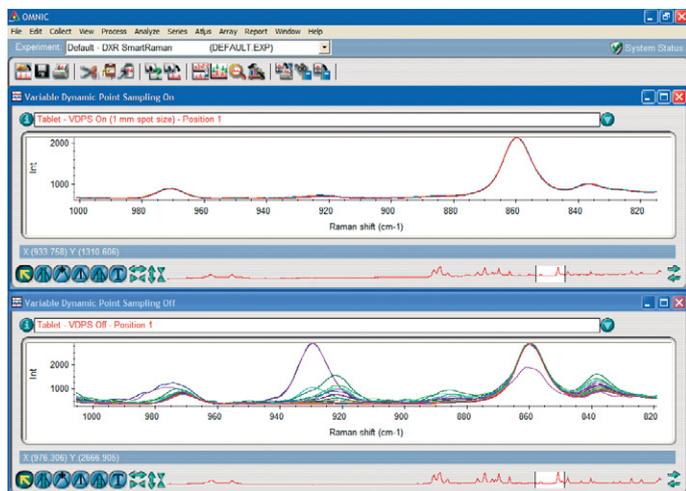
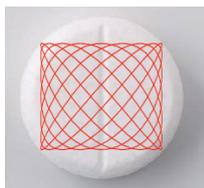
Utilize your DXR3 SmartRaman Spectrometer in high throughput and high pressure QA/QC environments to ensure quality and safety of your raw materials and finalized products.



Variable Dynamic Point Sampling

Overcome the challenge of collecting representative spectra from heterogeneous samples. Variable Dynamic Point Sampling (VDPS) technology rasters the excitation laser beam over the surface of the sample without loss of signal.

- The Universal Platform Sampling accessory employs VDPS technology to average the Raman signal from a heterogeneous sample, such as mixed powders or pharmaceutical tablets
- The effective size is user-selectable and software-controlled



Spectra of painkiller tablet taken at multiple sampling points: (top) with VDPS on; (bottom) without the use of VDPS.

Results you can trust

Thermo Scientific™ ValPro™ System Qualification software provides 21 CFR Part 11 compliance to give you reliable results that you can depend on. The identity and serial number of the accessory are recorded with the results for complete traceability.

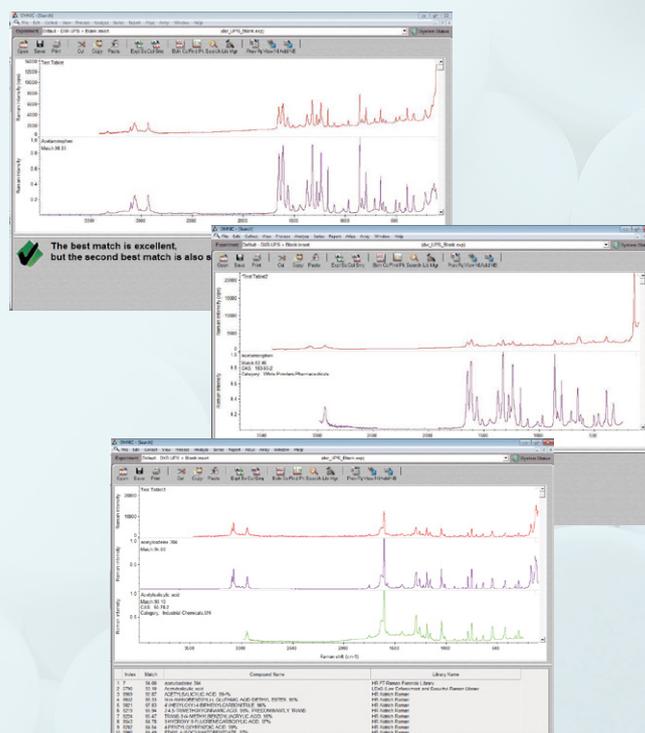
Analyze a wide variety of samples

From analysis of raw materials to final products, the DXR3 SmartRaman Spectrometer enables you to solve an extensive range of analytical challenges as you can get the answers you need.

- Confidently monitor quality, composition, and stability of raw materials
- Guarantee safety, verify content, and analyze formulations of finished products

Extensive spectral libraries

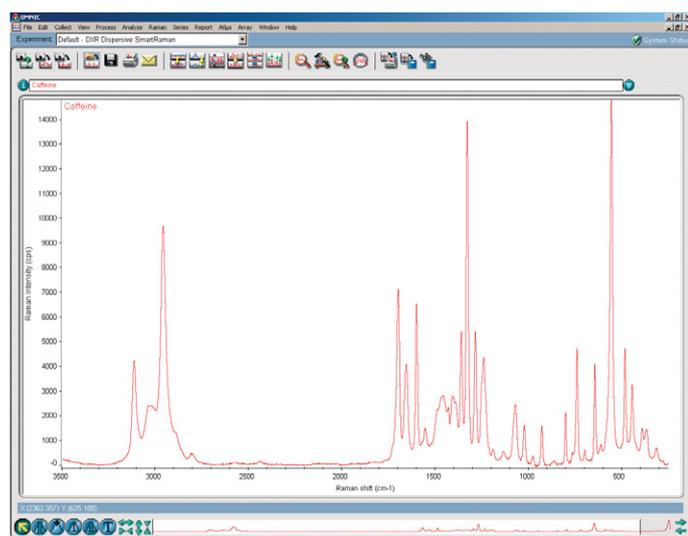
Whether you utilize one of our many commercial libraries or create your own custom libraries, the spectral search feature will give you confidence in your analytical results.



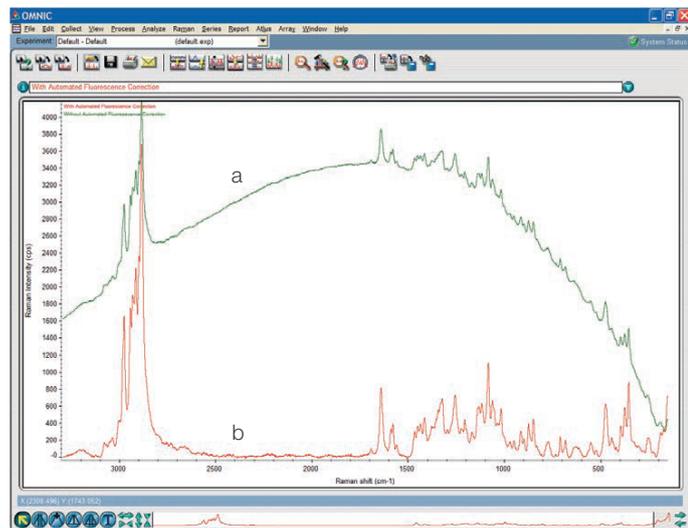
Use the spectral search function to qualify raw materials and finished products as well as identify unknowns in your processes.

The power of Raman in an easy-to-use format

Raman spectroscopy is a powerful analytical tool that can be used to obtain reliable answers. The DXR3 SmartRaman Spectrometer provides the best quality data with the OMNIC software platform that makes interpreting results easy.



Acquire high quality Raman spectra utilizing the built-in software features in OMNIC software.



Spectrum of an antihistamine: (a) without fluorescence correction; (b) with fluorescence correction.

Collecting quality data

Top quality results are made easy with the unique software features of the DXR3 SmartRaman Spectrometer. These features enable you to collect optimal Raman data, without having to become a Raman expert.

- Autoexposure – The software calculates the exposure time and number of exposures required to achieve the best possible spectral quality for a wide variety of samples
- Smart Background – Collects background data during instrument downtime and selects the appropriate background so you never have to think about background collection
- Autofocus – Optimizes the focus to maximize the Raman signal automatically
- Automatic Intensity Correction – Compensate for detector wavelength dependence
- Automated Fluorescence Correction – Utilizes the software to correct fluorescence interference, regardless of laser frequency used

From spectra to answers

Thermo Scientific™ OMNIC™ Specta™ software provides efficient data management, simplified data processing, and powerful spectral identification. Quickly and effortlessly characterize your spectra using spectral libraries on your system. Reveal the identity of components in mixtures with this unique searching feature.



In a single step, OMNIC Specta determines the identify of the three active ingredient in a multicomponent table: acetaminophen, acetylsalicylic acid, and caffeine.

Maximize productivity, Maintaining peak performance

With patented autoalignment, calibration and other features, routine instrument maintenance is easily incorporated into standard lab operating procedures.

Choice of Spectral Resolution

For routine analyses, standard spectral resolution will solve most analytical problems. For hard-to-resolve bands, high-resolution gratings are available.



Multiple Lasers

Be ready for any sample. Expand the capabilities of the DXR3 SmartRaman by adding additional excitation lasers. Minimize fluorescence interference or enhance sensitivity with shorter excitation wavelengths. Facilities with more than one DXR3 family instrument can share lasers, gratings, and filters for even greater versatility.



Easy-to-maintain Spectrograph

No moving parts, unique patented design optimizes performance at all wavelengths.

Pre-aligned Smart Components

Pre-aligned and lock-in-place laser, filters, and gratings use automatic recognition and store alignment allowing any user to reconfigure an instrument in seconds. Thermo Scientific OMNIC software checks for component compatibility.



Smart Lasers

Automatically track laser lifetime.

User-replaceable Components

No service calls required to replace a laser.

Fine-adjust Assembly

Software-controlled to maintain peak performance.

USB Connection

Full instrument control from either a desktop or laptop computer through USB ports.

Automated Calibration

Spectrograph, laser and Raman intensity calibrations are completely automated by OMNIC software using standards located in the alignment/calibration pod.

Patented Autoalignment

Keeps the excitation laser and the Raman scatter beam paths precisely aligned to the same sampling point for maximum sampling precision.

Laser Power Regulator

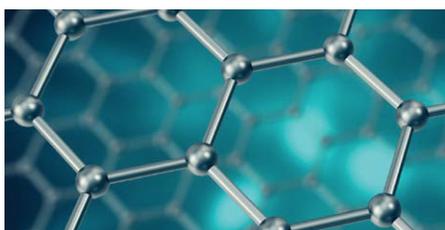
Guarantees consistent power at the sample.

Applications



Pharmaceuticals

- Rapid imaging for API distribution analysis
- Non-destructive analysis and minimal sample preparation
- Identification of isomers, hydrates, and polymorphs



Materials

- Chemical and structural analysis of multi-dimensional materials
- Ideal choice for determination of graphene layer thickness and determination of relative carbon nanotube diameter



Batteries

- Real time analysis of structural and material changes in lithium ion batteries
- Perfect for efficient ex situ analysis of anode and cathode materials



Polymers/packaging

- Visualization of 3D confocal spectral data
- Quickly understand multi-layer samples at high resolution
- Obtain data on structure and crystallinity



Microplastics

- Microplastics: Automated, multi-point microplastics analysis and identification
- Advanced software for optical and chemical location, characterization and identification of microplastics on filters
- Higher spatial resolution enables analysis of smaller particles complementing FTIR analysis



Gemstones and geology

- Rapid non-destructive identification of fluid inclusions in minerals
- Obtain data on crystallinity and crystal structure instantly

Learn more at thermofisher.com/SmartRaman

thermoscientific