RENISHAW
apply innovation™

Strada®

Intelligent Raman Microscope

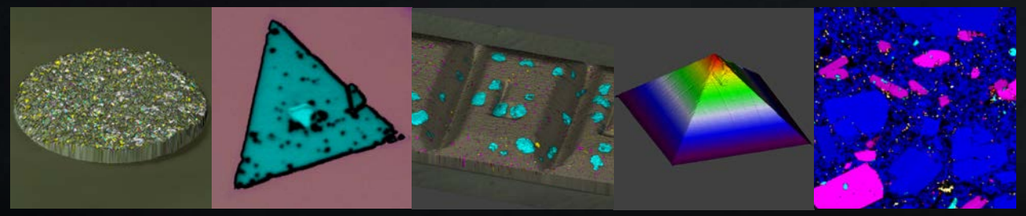
Performance | Intelligence | Confidence

Accelerate your analysis

Get high-quality chemical data every time

Add the Strada® intelligent Raman microscope to your laboratory. With cutting-edge features, it makes chemical and structural analysis simple and fast. The high-performance system gives you the confidence in your data to improve productivity, solve manufacturing problems and develop new products.

The Strada microscope combines the incredible optical performance and chemical discrimination of a research-grade Raman microscope with user-friendly operation. Fast, high-quality Raman analysis is now accessible to all users.



Performance

- **Sensitivity:** Analyse sub-micrometre particles, weak Raman scatterers, low concentration solutions and trace contaminants alongside traditional materials. Measure the weakest Raman bands such as the 4th order of silicon quickly and with world leading signal-to-noise ratio.
- **Resolution:** Differentiate between materials with confidence. Spectral resolution better than 1 cm^{-1}. Spatial resolution down to 250 nm.
- **Speed:** Rapidly generate Raman images of large areas, up to centimetres in size. Innovative scanning techniques produce data collection speeds exceeding 1000 spectra/s.

Intelligence

- **Fast sample setup:** Quickly identify microscopic regions of interest in large samples using the macro lens, motorised objective turret and focus-tracking technology.
- **Intuitive measurement workflow:** Watch the 10-minute get started video and go. Even brand-new users can quickly understand the Raman Workspace™ software and use the Strada system to collect the data they need.
- **Consistent analysis and results:** Configure templates to repeat analysis across multiple batches of samples. Present your data with customisable reports.

Confidence

- **Automated performance optimisation:** Alignment and calibration checks ensure that measurements stay accurate and consistent day after day.
- **Advanced support and remote servicing:** Maximum system uptime is achieved by the use of integrated telemetry, predictive maintenance and optional remote servicing.
- **Supports regulatory compliance:** Supports compliance with regulatory requirements, such as 21 CFR Part 11.

STRADA®

Get to know your next Raman microscope

We have designed the Strada system for operation within industrial and multi-user facilities. By incorporating innovative hardware and software features, we have made high-performance spectroscopy possible for every user, regardless of their level of expertise.

Save time with auto-focus

LiveTrack™ focus-tracking technology identifies and maintains sample focus during viewing and measurements. This enables the analysis of rough and uneven surfaces that would otherwise be impossible to measure.

Smarter chemical imaging

Packed with Renishaw's innovative Raman imaging technologies, the Strada microscope can image a vast range of sample types. Raman Workspace software automatically selects the best imaging technique based on the measurement conditions you set.

Analyse challenging samples

Optimised optical design and a high-performance thermoelectrically cooled CCD detector provides market-leading sensitivity and specificity. This allows measurement of the hardest samples.

Energy efficient

Integrated sleep and standby modes suspend the operation of the Strada microscope when not in use. These modes help to reduce power consumption while maximising laser lifetimes, without impacting your schedule.

Versatile sampling

The research-grade Raman microscope and large sample stage enable the measurement of microscopic, macroscopic and bulk samples. You can measure a diverse range of samples, including semiconductor devices, polymer films, pharmaceuticals, powders, liquids and gases.

Get the bigger picture

The integrated macro lens provides a large field of view when inspecting samples. This helps you find regions of interest and provides spatial context when analysing microscopic features.

Remote operation

The Strada system is entirely software-controlled including all lasers, gratings, objective lenses, and the sample stage. You can control the Strada microscope, run measurements, and analyse data from anywhere in the world.

Workflow-driven analysis

Raman Workspace software guides you intuitively from sample viewing to data analysis and reporting. This saves time, allowing brand-new users to collect and analyse data from the Strada system within minutes.

Configure with confidence

Designed as a fully enclosed system to protect internal components. All configuration changes are conducted in the software, eliminating the need for experts to change laser filters or gratings and prevents beginners from putting fingerprints on expensive optical components.

Always at its best

Built-in intelligent optimisation checks performance in seconds and re-optimises if necessary. This ensures you always get the best possible results, no matter what your measurement.

Precise sample movement

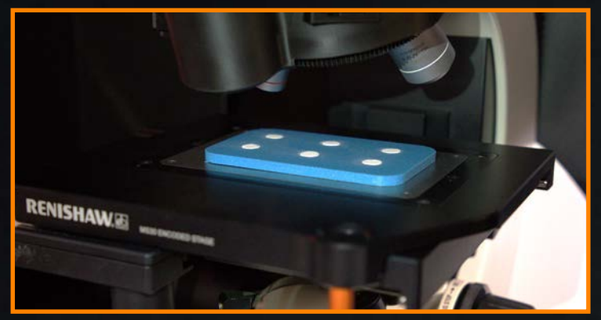
A fully encoded sample stage with 50 nm resolution allows for the collection of accurate and repeatable Raman maps and images over the entire stage range of 11 cm × 7 cm. Fully supports optical imaging and morphology-directed work such as morphologically directed Raman spectroscopy (MDRS).

Raman Workspace™ software

Intuitive workflows for intelligent analysis

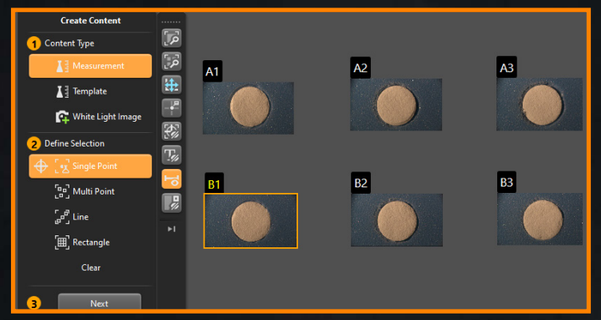
Raman Workspace software gives you full control of your Strada microscope. From data acquisition to analysis, the workflow guides you to the right measurement settings while helping you to see the bigger picture. Raman Workspace software gives you powerful experimental flexibility and helps you understand your results.

1. View sample and create a Project



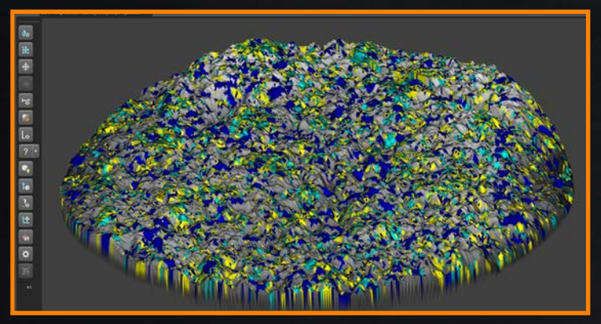
Utilise the comprehensive optical imaging system to survey large sample areas and identify regions of interest for further study. The macroscopic imaging mode enables you to quickly explore large areas. The motorised microscope objective turret and 8 Mpixel camera work seamlessly together, providing both optical and digital zoom for highly detailed observation of microscopic features.

2. Navigate and collect data



Move to different points on your sample, and collect optical images and Raman spectra, images or maps. The Workspace helps you organise your data, while displaying the relative locations of all your content within a sample, or between multiple samples.

3. Process, analyse and report data

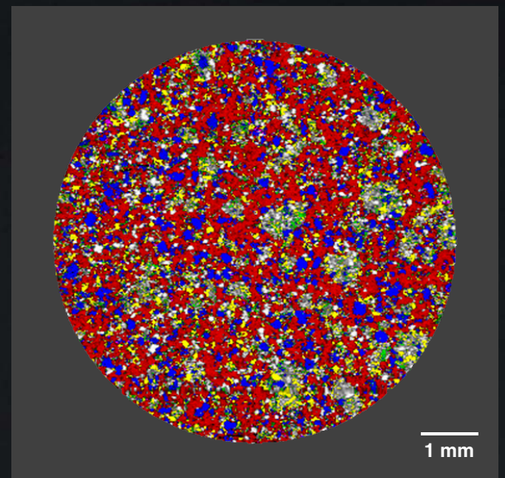


View your spectra and use powerful AI and algorithmic tools for data processing and analysis. Then present your results with customisable report templates. Export tools enable you to conduct bespoke analysis in third-party software like Microsoft® Excel™ and Matlab™ or pass values into your proprietary analyses, such as PLS and AI models, or statistical process control tools.

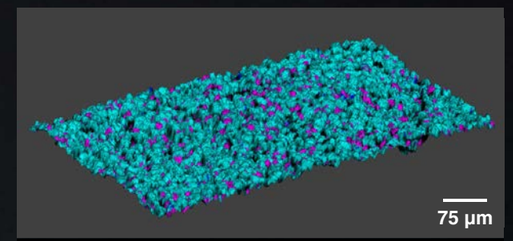
See chemistry and structure

Understand the quality and distribution of your materials

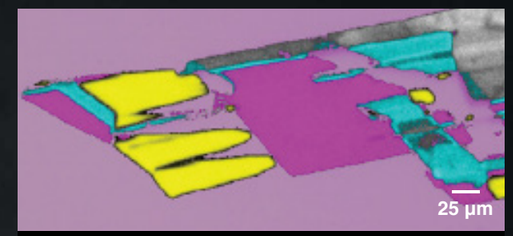
The Strada microscope is equipped with our most advanced Raman imaging and mapping technologies. With unparalleled speed, sensitivity, and confocality, you can effortlessly characterise macroscopic and microscopic samples, including the tiniest particles and nanomaterials.



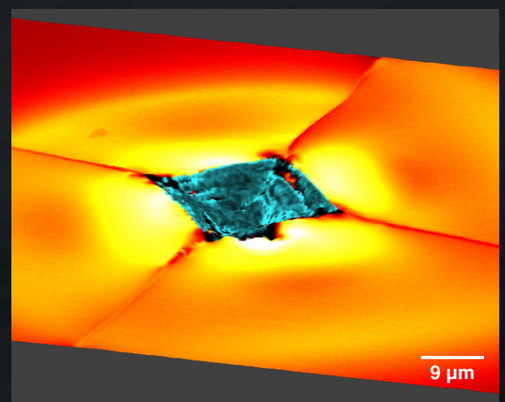
Raman image of a pharmaceutical tablet showing the distribution of API and 6 excipients.



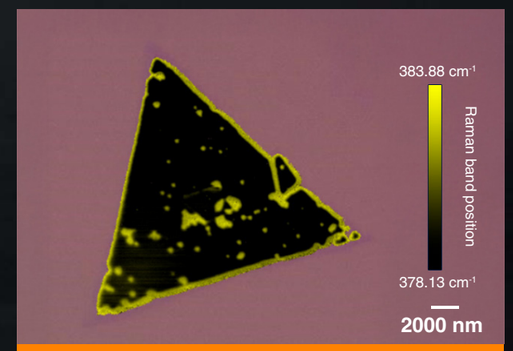
Raman image of a silicon-carbon anode showing the domain sizes and distribution of carbon allotropes and silicon oxide.



Raman image of varying thicknesses of graphene overlaid on a high-magnification optical image.



Raman image of a Vickers indented silicon wafer, with the indented region in cyan and surrounding stress variations in red to yellow.



Raman image of MoS_2 flake. Variations in the Raman band position were used to detect defects down to 250 nm.

Service and support

At Renishaw, our goal is to provide peace of mind, ensuring your instrument is operational and optimised when you need it most. We offer a range of tailored service agreements to meet your specific needs. Our support agreements include:

- Advice on optimising your data collection and sample analysis.
- Instrument monitoring and preventative maintenance.
- Proactive and reactive laser replacement.
- Online and on-site service, evaluation and repair.
- OQ/PQ validation services for instruments in regulatory environments.
- Specialised training.

Specifications

Instrument modalities	Raman spectroscopy, mapping and imaging. Photoluminescence (PL) spectroscopy mapping and imaging. Brightfield optical microscopy with eyepieces for direct observation. Other microscopy modes available on request.
Laser excitation wavelengths	532 nm, 633 nm and / or 785 nm; other wavelengths available on request.
Laser power control	0.1 mW increments
Number of Raman filters	Up to 8 internal with motorised selection and angle tuning; 30 cm^{-1} edge as standard.
Number of gratings	Up to 6 internal and motorised.
Scanning range	SynchroScan™ extended scanning technology for artefact-free, high-resolution spectra from 400 nm to 1100 nm.
Maximum data collection speed	> 1800 spectra/s
Fast Raman imaging modes	2D and 3D mapping. High-resolution StreamHR™ imaging technology. Ultrafast line imaging with StreamLine™ imaging technology. Slalom mode for complete sample coverage during imaging.
Motorised stage range	112 mm × 76 mm
Sample stage encoder resolution	50 nm

Autofocus	LiveTrack™ focus-tracking technology actively maintains focus during Raman mapping and optical image collection.
Calibration standards	Internal silicon sample. Other calibration sources available on request.
Performance optimisation	Built-in digital performance logbook. Fast laser auto-alignment. Optional advanced telemetry for proactive support and maintenance.
Detector size	1024 pixel × 256 pixel
Detector operating temperature	–70 °C
Laser safety class	Class 1
Sustainability options	Instrument sleep and laser snooze modes, to reduce power consumption and maximise laser lifetime.
Dimensions	< 1 m^3 H 678 mm × W 975 mm × D 742 mm
Mass	130 kg
Power supply	100 V AC to 240 V AC; 50 Hz / 60 Hz
Maximum power consumption	375 W
Standards	CE, UKCA
Regulatory and compliance	21 CFR Part 11

Let us help you with your Raman analysis. Contact us at **raman@renishaw.com**

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