Brochure: Introducing the RA802
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Introducing the RA802 Pharmaceutical Analyser

The RA802 Pharmaceutical Analyser: a compact benchtop Raman imaging system that redefines pharmaceutical analysis. Generate information rich chemical images and see the composition and distribution of compounds in intricate detail. Get the meaningful metrics you need quickly, easily and reliably.

Discover the RA802 in this information pack and find out how you can see it in action on page 4.

The pharmaceutical industry is driven by continuous development

The challenge of bringing a drug to market has changed drastically over the last decade as business, science and regulation evolves globally. At Renishaw, we are continuously developing analytical solutions to help you succeed.

We have extensive experience designing and developing Raman systems, providing solutions with superior performance. Our systems have the potential to transform discovery, development and manufacturing in the pharmaceutical industry. A Renishaw Raman system gives you the tools to stay ahead of the competition and regulatory requirements.

How can Raman spectroscopy help me?

Renishaw Raman systems are ideal for analysis throughout drug development and manufacture.

Raman spectroscopy is an optical analysis technique that analyses scattered light. It reveals the chemical composition of materials and the distribution of constituents.

- Non-destructive; analysis without time-consuming sample preparation
- Flexible; analyse formulated products, polymorphic APIs and much more
- Spatial information; determine the distribution of constituents within samples
- Quantitative data; obtain numerical metrics such as domain size statistics

RA802 Pharmaceutical Analyser

Designed exclusively for the pharmaceutical industry, the RA802 is a chemical imaging system optimised for routine analysis with the speed, automation and precision you need for reliable results. It is ideal for use in busy laboratories where the rapid analysis of multiple samples is required.

Coupled with Renishaw's powerful software you can analyse a range of samples with quantifiable results. The RA802 is fully compliant with relevant standards, such as ASTM, Pharmacopeia and CFR21 pt 11, with the validation required to meet the specific challenges of the pharmaceutical industry.

- Look at tablets, powders, granules and liquids in their original form.
- Analyse multiple tablets without user intervention
- No sample preparation needed; no risk of sample modification or contamination
- View information-rich chemical images rendered onto 3D surface data
- Accessible Raman spectroscopy for all users, without compromised performance

Redefining Raman spectroscopy

The RA802 brings together the chemical analysis power of Raman spectroscopy and advanced imaging technologies in a simple, robust system. It gives you outstanding performance and the results you need, quickly and without complexity.

No sample preparation

The RA802 provides a practical solution for analysing pharmaceuticals, with no risk of sample modification or contamination. Intact tablets can be analysed, or they can be split or sliced to reveal their internal structures. Look at powders, granules and liquids in their original form. The RA802 reveals detailed chemical and physical information, from the distribution and size of API domains to physical topography. Understand your sample by viewing information-rich chemical images rendered onto 3D surface data.

Rough, uneven, or curved surfaces? No problem!

Analyse uneven, curved, or rough surfaces at incredible speeds. The RA802 uses focus-tracking technology to produce two dimensional and three dimensional chemical maps of a tablet's surface.

- Maintain focus during data collection, for optimum spatial resolution across the whole tablet surface
- Look at tablets, powders, granules, liquids and sprays
- Acquire domain size and distribution information from complex surfaces (e.g. a tablet surface)
- Determine tablet coating uniformity
- Measure surface topography

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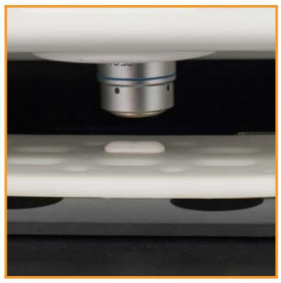
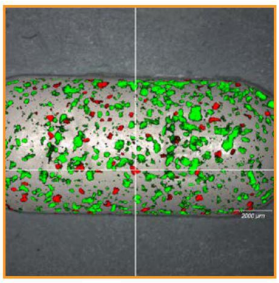
Simplifying analysis

Straightforward Raman imaging with the RA802

With the RA802 analysis is straightforward and rapid. Reveal chemical and physical information about your sample in four simple steps.

1. You place your tablets on the dedicated tablet holder, snapping or splitting them as necessary
2. The RA802 automatically generates a macro image providing an overview of the array of samples
3. You specify the area to analyse
4. The RA802 then:
   a. scans the tablets, using focus-tracking technology to keep them in focus
   b. generates tablet images, particle statistics and metrics that reveal chemical and physical information about your tablet



What makes the RA802 different?

Save time

- The RA802 can acquire data unattended. Its queuing capability enables you to configure a batch of measurements and leave the RA802 to run them
- The RA802 uses a line-focused laser; minimising power density on the sample. This avoids harming sensitive samples whilst collecting data at maximal speeds
- Ultra-fast Raman data collection; over 1000 spectra/s
- The RA802 uses focus-tracking technology. No need for the time-consuming sectioning or milling of tablets

Reliable data

- Reveal detailed chemical and physical information about the true contents of your sample. No sample preparation is required, so there is no risk of modification or contamination
- Inbuilt automated performance qualification (PQ) and optimisation
- A Raman spectral library dedicated to pharmaceuticals makes it quick and easy to identify unknowns

Flexibility

- Generate images of the formulations used in intact tablets, split tablets, milled tablets, powders and sprays
- Differentiate and identify API polymorphs and excipients
- Analyse through transparent coatings
- Raman analysis is non-contact and non-destructive, so you can study the same sample many times and with other techniques

Powerful software

The RA802's software provides a structure for managing every step of the process. The unique macro image provides a comprehensive overview of all subsequent work. Renishaw's proprietary empty modelling technique automatically analyses the sample and indicates the components present. This can be achieved without any prior sample knowledge.

See the RA802 Pharmaceutical Analyser in action

The RA802 Pharmaceutical Analyser is designed exclusively for the pharmaceutical industry. See it in action to fully appreciate its unique capabilities and its potential to transform your analytical workflow.

Webinars

Join Renishaw's Raman experts in one of our live webinar sessions. Discover a Quality by Design (QbD) approach using the RA802 Pharmaceutical analyser. Ensure product understanding and risk management with rapid, non-destructive measurements of rough and uneven surfaces. Learn how to identify and monitor Critical Quality Attributes (CQA) throughout pharmaceutical development and manufacture with the RA802.

Topics covered in the webinar include:

- Who is Renishaw?
- Introducing the RA802 Pharmaceutical analyser
- Raman spectroscopy and imaging: what is it?
- How can the RA802 help you?
- A demonstration of the RA802 - sample preparation to report generation
- Case studies
- Live question and answer session

Symposia

See the RA802 first hand at one of our symposia. These exclusive events allow an immersive experience with the RA802. Discover in detail the unique capabilities of the RA802 Pharmaceutical Analyser and learn more about Renishaw's key technologies.

Events

Are we coming to an event near you? We attend events globally, visit **renishaw.com/ramanevents** to see where we are heading this month. Come along and talk to a Renishaw representative about our innovative new technologies!

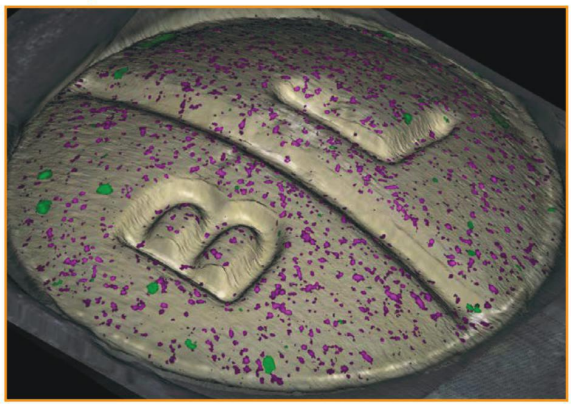
Visit **www.renishaw.com/RA802** for more information and to see a demonstration video.

RA802 Pharmaceutical Analyser

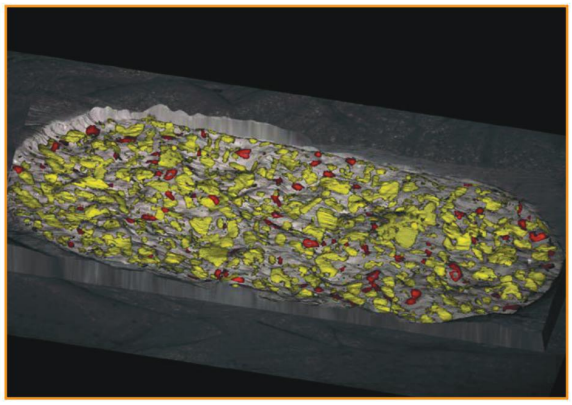
High speed encoded stage

If you have any questions or would like to speak to a Renishaw representative contact us at **raman@renishaw.com**

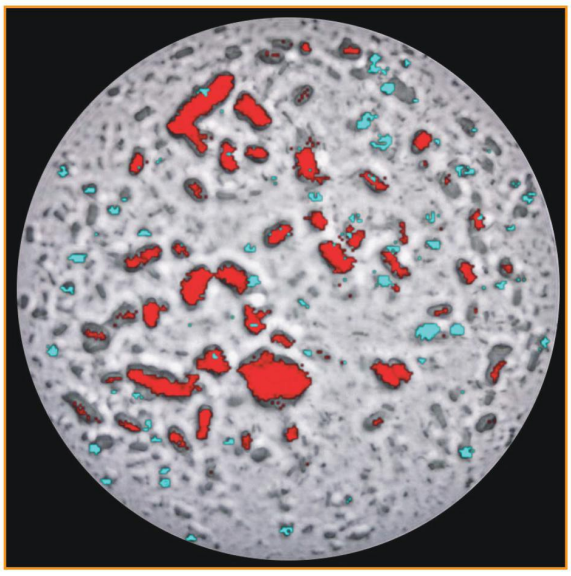
Examples



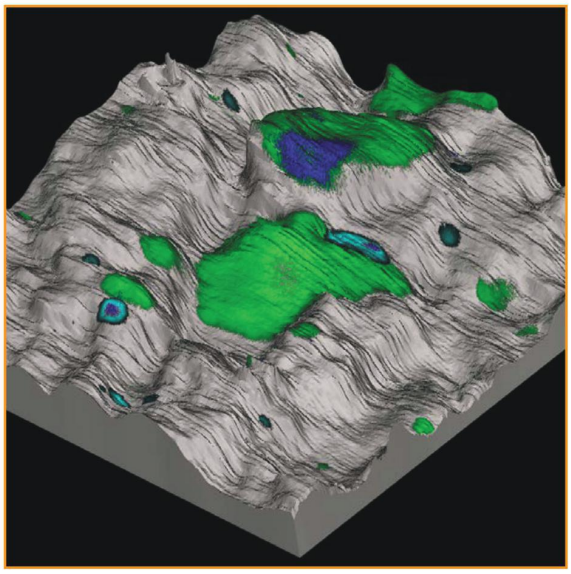
Allergy relief tablet showing low concentration API (green) and maize starch (magenta).



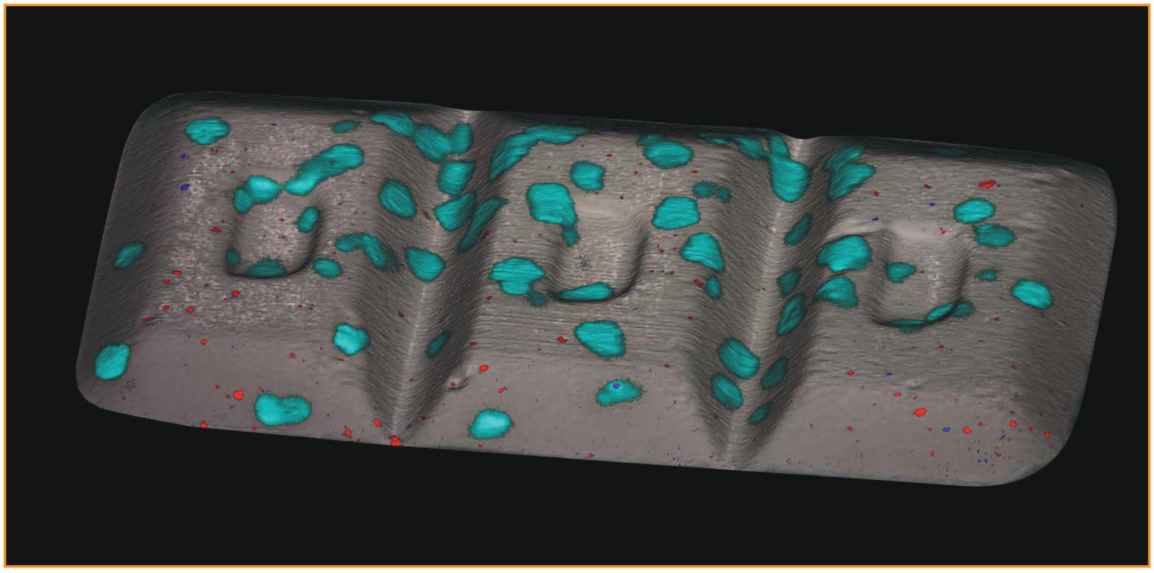
Analgesic tablet split in half showing caffeine (red) and aspirin (yellow).



Allergy relief spray showing the distribution of API (cyan) and micro crystalline cellulose (red).



Powder mixture showing form III (blue) and form V (green) API.



Tablet showing the distribution of API (cyan), maize starch (red) and crospovidone (blue).

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About Renishaw

Renishaw is an established world leader in engineering technologies, with a strong history of innovation in product development and manufacturing. Since its formation in 1973, the company has supplied leading-edge products that increase process productivity, improve product quality and deliver cost-effective automation solutions.

A worldwide network of subsidiary companies and distributors provides exceptional service and support for its customers.

Products include:

- Additive manufacturing and vacuum casting technologies for design, prototyping, and production applications
- Dental CAD/CAM scanning systems and supply of dental structures
- Encoder systems for high-accuracy linear, angle and rotary position feedback
- Fixturing for CMMs (co-ordinate measuring machines) and gauging systems
- Gauging systems for comparative measurement of machined parts
- Laser and ballbar systems for performance measurement and calibration of machines
- Medical devices for neurosurgical applications
- Probe systems and software for job set-up, tool setting and inspection on CNC machine tools
- Raman spectroscopy systems for non-destructive material analysis
- Sensor systems and software for measurement on CMMs
- Styli for CMM and machine tool probe applications

For worldwide contact details, visit www.renishaw.com/contact