Introducing the PerkinElmer RamanStation 400
Raman Spectrometer
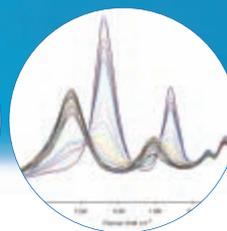
Stay focused on what you need...

results.

PerkinElmer®
precisely.

Look into the RamanStation
– you'll discover visionary thinking

A NEW approach to Raman

Introducing the revolutionary NEW PerkinElmer RamanStation™ 400 bench-top spectrometer – it's Raman technology like you've never known before. Efficient. Easy to use. Consistently accurate. Now your laboratory can get fast, highly reproducible results for the level of throughput and productivity you need.

Easy to understand and use

Thanks to new, cutting-edge technology, the RamanStation 400 does not require constant adjustment or alignment. It was designed for intuitive use, freeing you to concentrate on what is really important: obtaining high-quality results. And its operating ease is complemented by PerkinElmer's powerful range of Spectrum™ software packages.

Focused on simple operation

RamanStation 400's software-controlled X, Y, Z sample stage automatically aligns your sample in all three coordinates to obtain the optimum spectrum. Large numbers of spectra can be acquired quickly, providing reproducible, research-quality results – all at the touch of a button.

Echelle technology saves you time

Most Raman instruments have motorized gratings, producing one-dimensional dispersion with limited spectral range that must be "scanned and stitched" together by software. The RamanStation 400's echelle-based spectrograph disperses light into a two-dimensional pattern, giving you full spectral coverage and high resolution – all within one second.

- No waiting for software to stitch high-resolution scans together
- A full-range spectrum is produced in one scan

And because there are no moving parts and all the data is collected simultaneously, there are no spectral artifacts.

Research-level performance

PerkinElmer recognizes that your work demands an extremely high level of accuracy. Our echelle spectrograph was specially designed for Raman, not borrowed from ICP spectrometers or telescopes. It is highly optically efficient and has no "dead" zones.

Raman spectroscopy – a perfect complement to FT-IR and FT-NIR

Because Raman spectroscopy offers a complete high-resolution spectrum, the resulting analysis yields rich information about the molecular structure of a sample. Raman can stand alone as an analytical technique or be used in conjunction with existing instrumentation to provide complementary information to that obtained from Mid-IR and Near-IR spectroscopy. However you use it, the RamanStation 400 will be a valuable analytical tool suitable for a wide range of applications.

The PerkinElmer RamanStation 400
– a clear advantage

Every compound has its own unique Raman spectrum, providing a virtual fingerprint for identification. Identifying, characterizing and investigating the structures of a wide range of material types are easier than ever using the RamanStation 400. It is equally capable of analyzing organics, inorganics, polymers and biomaterials, providing you with high-quality data in a matter of seconds.

Benefits include:

- **Little or no sample preparation** – Different sampling geometries are not needed, so solids, liquids, powders, gels, slurries and aqueous solutions can be identified in situ

- **Non-destructive technique** – Low laser powers and lack of sample preparation preserve the integrity of the sample and make it available for further analysis

- **No water interference** – In contrast to FT-IR spectroscopy, water has a weak Raman spectrum, allowing faster, easier and more informative analyses of aqueous samples

- **Minimal glass interference** – Spectra of samples in transparent containers such as glass or plastic can be obtained without opening the container and extracting the material. Rapid identification can be made without compromising the sample or exposing you to risk

- **Extended spectral range** – Routinely collect spectral data down to ~90cm^{-1} wavenumbers. In comparison with most standard FT-IR systems, this extended range can provide more information on inorganic materials such as fillers and pigments

An overview of Raman spectroscopy

Raman spectroscopy is a *vibrational technique for identification and analysis of molecular species*. It is one of the fastest growing techniques in molecular spectroscopy.

The science is based on the detection and processing of the scattered radiation produced from a molecule when it is irradiated with a monochromatic laser light. The spectrometer collects and disperses scattered radiation onto a detector. When the detector signal is processed, it produces the molecule's unique Raman spectrum.

Raman spectrometers can be either dispersive or Fourier Transform (FT) based. Unlike FT-based instruments, dispersive-based Raman instruments use a CCD detector.

There are two types of dispersive-based spectrometers:

Monochromator – Motorized gratings piece one-dimensional strips of light into multiple parts; the software then stitches all the parts together.

Echelle – Two gratings disperse the light spectrum into a two-dimensional pattern. Many parallel strips of light, each covering a different portion of the spectrum, are *simultaneously* detected. The complete data set is processed at once, to generate a full-range, high-resolution spectrum in less than one second – without incurring any unwanted stitch marks. Echelle technology is used in the RamanStation 400.

A new approach
to a familiar technique

Autosampling and autofocus

The software-controlled motorized sample stage of the RamanStation 400 puts you in control of the full range of sampling options. Movement in X, Y and Z directions allows you to perform:

- *Single spectrum acquisition*
- *Macro sampling*
- *Mapping*

- *Line scans*
- *Depth profiles*
- *High-throughput analysis*

Interchangeable sampling modules

The RamanStation 400 has the greatest sampling flexibility of any Raman system currently on the market. A full range of clip-in sampling accessories and drop-in sample holders ensures the widest range of sample types can be accommodated. The modular sample compartment makes it ideal for running everything from routine samples in glass vials to automated quantitative analysis of multiple samples on well-plates. Microscopes and fiber probes can also be fitted to the external sampling port.

No Raman expertise required

The RamanStation 400 does not require specific Raman expertise. At the touch of a button, you get auto-focused spectral acquisition, baseline removal and library searching. This extraordinary ease of use means that even non-specialists can obtain the highest quality data easily and with a minimum of training.

Call **+39 039 2383-1** to speak with a PerkinElmer Raman specialist.

E-mail us: *productinfo@perkinelmer.com* or go to *www.perkinelmer.com/raman*

PerkinElmer redefines Raman.

Raman spectroscopy has never been so exciting, until now…

Unique, no-moving-parts echelle technology

- Enables higher productivity through faster data collection
- Requires no alignment before use, increasing system uptime and data reproducibility
- Echelle optics include a high-sensitivity, scientific-grade CCD detector that is mounted in a zero-maintenance, vacuum-sealed unit with thermoelectric cooling down to -50°C

A Windows®-based "Video in Window" camera

- On-screen, live visible image, approximately 30x magnification for sample alignment and viewing
- Visible Image Survey allows image collection for samples larger than the camera field of view
- Interactive visible image and acquisition setup displays maps, or linescan, collection points over the visible image

Simply point and analyze

Fiber optic probes allow you to bring the spectrometer to the sample, making results easier than ever to gather. With a simple point and click process, you can analyze a range of samples types – even in uncontrolled environments and restricted spaces. Offering considerable additional functionality, like in-situ analysis and reaction monitoring, this easy-to-use accessory will be beneficial to your lab.

Ideal for your laboratory
– whatever your perspective

Academic Research:

- Research-grade performance at the push of a button makes it simple for all lab personnel to operate
- Sample identification, quantitative analysis and mapping applications – ideal for academic research
- Frees up research-grade systems by providing a fast, easy-access system for technicians, students and members of other departments
- Research-level data quality with highly reproducible results

Pharmaceuticals/Healthcare:

- Ease of sampling and spectral Search/Compare facility – perfect for QA/QC laboratories
- Easy and effective configurability to measure solids, liquids, powders and pastes
- High spectral specificity and extended wavenumber range – ideal for differentiation of polymorphic samples
- Reliable high-throughput screening – optimum performance for newer, ultra-high-sensitivity detection applications

Polymers/Chemicals:

- Effective QC/QA tool in conjunction with Mid-IR or as a "stand-alone" technique
- Robust performance – ideal analytical tool for identification of recycled polymers or waste materials. Flexibility enhanced with remote fiber probe
- Study polymer "backbone structure" and crystallinity within samples
- Accurate analysis of multi-layered polymers, paints and other surface coatings, as well as identification of inclusions in polymer materials

Forensics:

- Perfect for forensic investigations – perform in-situ analysis of liquids, tablets and powders through glass containers or plastic bags
- Excellent method of material identification for narcotics, explosives, fibers, fabrics, pigments, resins, etc.
- Measures down to 100 cm^{-1} – provides additional information about inorganic species, such as fillers and pigments

PerkinElmer RamanStation is backed by the best support team in the industry.
Go to *www.perkinelmer.com/raman* to learn more.

The Spectrum Software Suite

– powerful software that works the way you do

Whether you're analyzing spectra or chemical images, performing quantitative analysis or monitoring reactions, there's a comprehensive suite of software packages available for the RamanStation 400. And all employ PerkinElmer's modern, streamlined Spectrum interface – which is common to both Raman and IR product lines – letting you navigate effortlessly through each of your tasks.

Enjoy simple, step-by-step guidance, with instrument control and experiment setup

Set up spectral analysis, mapping, linescan and reaction monitoring experiments – easily – with our intuitive, interactive experiment setup interface. Enabling features include:

- Real-time spectral preview
- Video preview
- Visible image survey
- Raman and video image autofocus
- Auto exposure time calculation
- Random-access high throughput analysis
- Real-time baseline correction
- Photobleaching

Experience a new standard in quantitative calibration models

Develop quantitative calibration models for analysis of individual spectra or groups of spectra. This reduces method development time, improves data pre-processing and minimizes parameter entry.

Get a clearer look at what you're measuring

Generate chemical images and perform high throughput analysis using peak intensity area, Quant+ models or Show Structure, our unique automated Partial Least Squares (PLS) data analysis. The information identified automatically generates images displaying the chemical structure of the sample.

Follow reaction trends in real-time

Monitor reactions and track process using peak intensity, wavelength or Quant+ quantitative result. And, with our digital/analog interface card, you can provide real-time feedback to third-party devices or process control DCS stations.

Perform spectral Search or Compare, using either purchased or user-generated libraries

Compare is an ideal tool for QA/QC, enabling automatic spectral comparison based on statistical analysis of acquired and standard spectra. Search is a simple, intuitive functionality for building custom spectral libraries, as well as querying commercial databases.

Share results, easily

Use the quick-print facility for graphs, spectra and results windows. And you can create templates for custom printed and electronic reports.

PerkinElmer: Exceeding expectations for over 60 years

PerkinElmer manufactures and supports the broadest range of instruments, reagents, and consumables in the industry – giving us unparalleled knowledge and depth of expertise. With over 60 years of experience, PerkinElmer is a company you can count on to be there when you need us. We have the largest and most experienced service force in the industry. Our 1,200 factory-trained and certified engineers have an average of 15 years of experience maintaining leading-edge scientific equipment including preventative maintenance, validation support, and instrument repair, along with the training and technical support you have come to rely upon.

We provide the skills and capabilities to deliver solutions that enable laboratories like yours to be more productive and efficient. Our solutions are customized to meet your individual needs, and can address issues ranging from asset management to technical training of your personnel to equipment moves. We also provide solutions for multi-vendor environments, including preventative maintenance, validation, repair and compliance. Working with you, we'll make sure that your laboratory achieves its goals.

That's precisely our business.

Experience the PerkinElmer RamanStation difference

THE UNIQUE AND INNOVATIVE DESIGN OF THE RAMANSTATION 400 OFFERS:

- Simple, touch-button operation – no expertise required

- Research-level performance – very high quality data results

- Ease of use – regular alignment not necessary

- Higher productivity through fast data collection – no waiting for "scanning and stitching"

- Fully featured, many options – can accommodate a great variety of samples

- Motorized sample stage – perfect for automated or high-throughput work

- The award-winning global service and support of PerkinElmer – recognized as the industry leader

Call **+39 039 2383-1** to speak with a PerkinElmer Raman specialist.

E-mail us: *productinfo@perkinelmer.com* or go to *www.perkinelmer.com/raman*

RamanStation 400 is a Class 1 laser device and can be routinely used in regular laboratory environments; RamanStation 400F is available in Class3b and Class1 configurations; appropriate laser safety precautions should be observed.

PerkinElmer, Inc.
940 Winter Street
Waltham, MA 02451 USA
Phone: (800) 762-4000 or
(+1) 203-925-4602
www.perkinelmer.com

For a complete listing of our global offices, visit www.perkinelmer.com/lasoffices

007788_02   Printed in USA