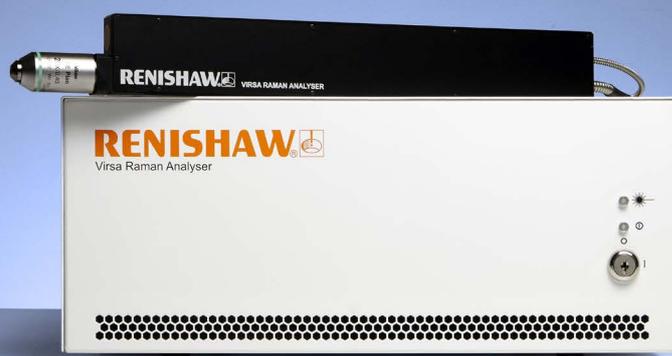


Analysing liquids with the Virsa™ Raman analyser



The Virsa Raman analyser and liquids

Renishaw's Virsa Raman analyser is a flexible, fibre-coupled system that is excellent for monitoring liquids in R&D and process development settings.

The Virsa analyser has many features that make it ideal for studying liquid samples:

- It has high throughput and gets intense, low-noise Raman signals from liquids
- The rugged fibre-coupled spectrometer can be operated in industrial environments, as well as in laboratories, and is easy to couple to chemical reactors
- It can be coupled to a variety of immersion and through-window probes giving great sampling flexibility
- It is compatible with a wide range of probes specifically designed for harsh chemical environments and at elevated pressures and temperatures
- The dual excitation wavelength capability of the Virsa analyser enables it to probe a wider range of samples than a single-wavelength system
- It has a high sensitivity, comparable to Renishaw's inVia™ Raman microscope, making the two instruments ideal for transitioning laboratory-developed solutions to in-field and production line use



Figure 1 - Virsa analyser with an immersion probe

Analysis of liquids

Here we illustrate data collected from the common industrial liquids cyclohexane and ethanol using both immersion and through-window sampling. Figure 2 is a Raman spectrum of cyclohexane collected with a 785 nm laser; the acquisition time was 1 second.

One of the strengths of the Virsa Raman analyser is its extended scanning capability that enables spectra to be collected over broad spectral ranges, such as from 50 cm^{-1} to 4000 cm^{-1} . This is demonstrated in Figure 3 where both immersion and through-window probes have been used to collect broad range Raman spectra from ethanol. In these spectra we can see not only the C-H stretch region at about 3000 cm^{-1} but also the whole of the fingerprint region below 1500 cm^{-1} . The two probes give comparable signal levels, with a slightly higher background from the immersion probe. This highlights how well the Virsa Raman analyser performs with both probe types and enables the user to select the probe most suited to their experiment.

Summary

- The Virsa Raman analyser is a powerful tool for process development
- It can be coupled with a wide range of fibre probes making it suited to diverse applications
- The Virsa Raman analyser's highly sensitive design makes it ideal for measuring difficult Raman samples quickly and with high signal-to-noise ratios

Contact Renishaw's application experts to discuss your requirements and discover how the Virsa analyser can help you analyse your liquid samples.

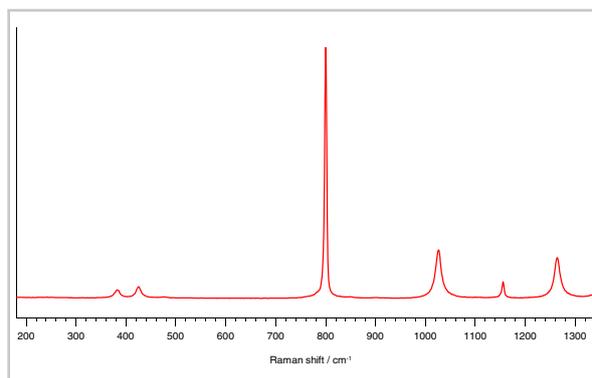


Figure 2 - Raman spectrum of cyclohexane collected in 1 second

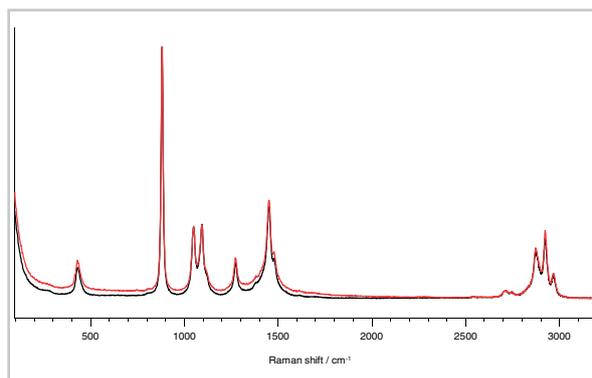


Figure 3 - Raman spectra of ethanol collected using an immersion probe (red) and through window probe (black)

A range of related Renishaw literature is available. Please ask your local Renishaw representative for more information.

Renishaw. The Raman innovators

Renishaw manufactures a wide range of high performance optical spectroscopy products, including confocal Raman microscopes with high speed chemical imaging technology, dedicated Raman analysers, interfaces for scanning electron and atomic force microscopes, solid state lasers for spectroscopy and state-of-the-art cooled CCD detectors.

Offering the highest levels of performance, sensitivity and reliability across a diverse range of fields and applications, the instruments are designed to meet your needs, so you can tackle even the most challenging analytical problems with confidence.

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

Please visit www.renishaw.com/virsa for more information.

RENISHAW HAS MADE CONSIDERABLE EFFORTS TO ENSURE THE CONTENT OF THIS DOCUMENT IS CORRECT AT THE DATE OF PUBLICATION BUT MAKES NO WARRANTIES OR REPRESENTATIONS REGARDING THE CONTENT. RENISHAW EXCLUDES LIABILITY, HOWSOEVER ARISING, FOR ANY INACCURACIES IN THIS DOCUMENT.

AN240(EN)-01-A September 2020 © 2020 Renishaw plc. All rights reserved.
Renishaw reserves the right to change specifications without notice.

RENISHAW, the probe symbol used in the RENISHAW logo, and Qontor are registered trade marks of Renishaw plc in the United Kingdom and other countries. apply innovation and names and designations of other Renishaw products and technologies are trade marks of Renishaw plc or its subsidiaries.
All other brand names and product names used in this document are trade names, trade marks or registered trade marks of their respective owners.