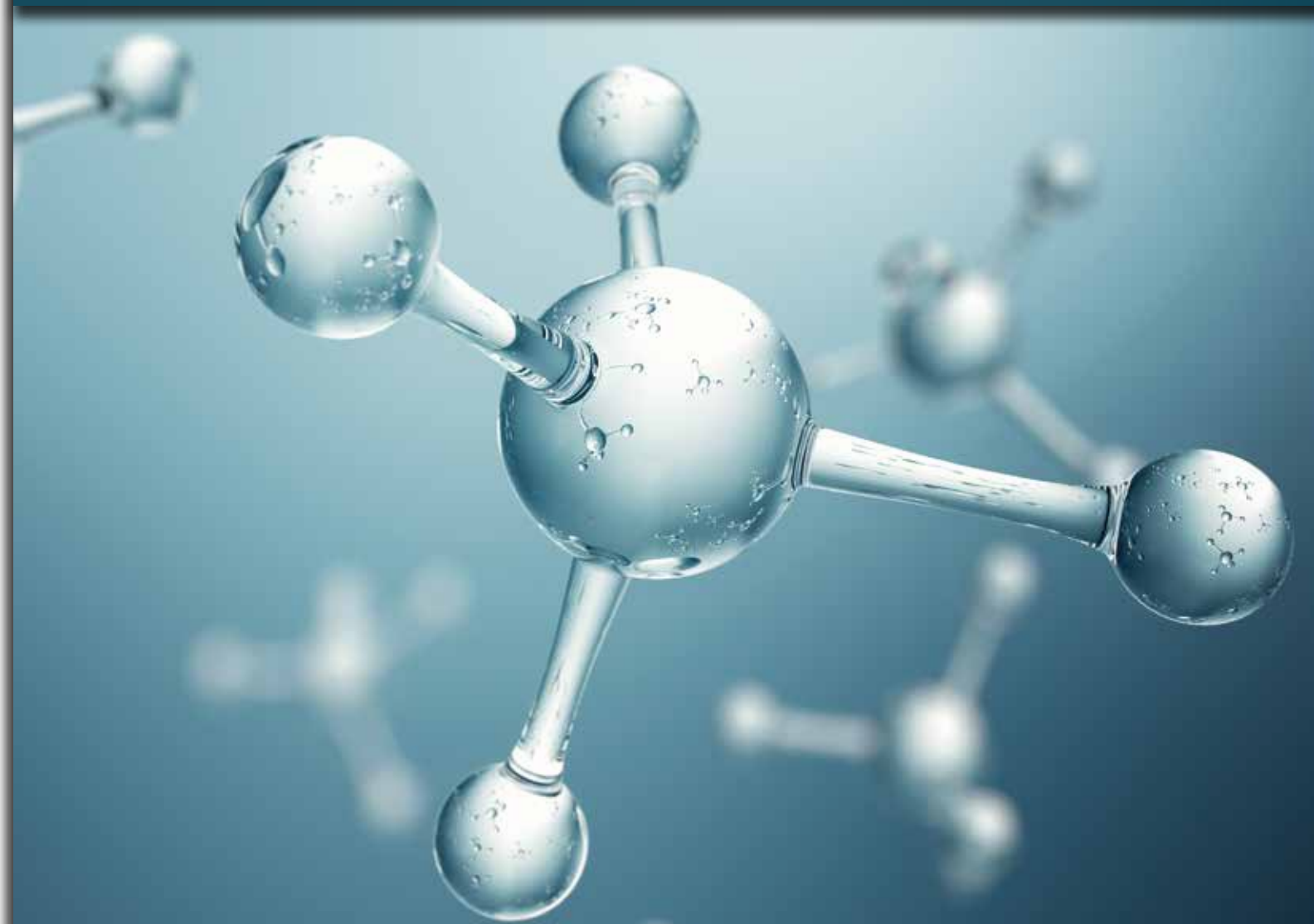
LASER 2000

Application

Raman Spectroscopy



Raman Spectroscopy – The unique technology

Raman spectroscopy has greatly influenced and revolutionized the analytical measurement market. The unique technology offers many advantages over conventional spectroscopy methods and opens up new possibilities in many areas such as life science, pharmaceutics, environment and mineralogy.

With the help of Raman spectroscopy, almost all material states, such as gases, liquids, powders and solids, can be analyzed. A complex and time-consuming sample preparation is usually not required. A complete analysis of the sample composition is given in shortest time with highest sensitivity and accuracy.

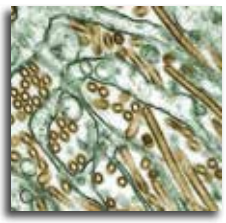
Illusstration of plastic waste particles to be analyzed using Raman spectroscopy

Life Science

Biosensing

Raman spectroscopy enables rapid analysis of structural and functional properties of biomolecules. At low concentrations, a large variety of chemical compounds can be identified.

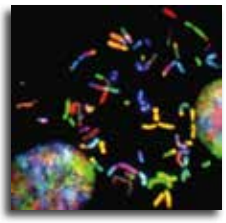
- No cell labelling or staining is required
- In vivo analysis of cells is possible
- Time-dependent biochemistry can be monitored



Disease diagnosis

As a non-invasive diagnostic method, Raman spectroscopy provides detailed information about biochemicals and can therefore be used to diagnose or monitor the course of certain diseases.

- Enables in situ diagnosis of disease in tissue
- Can be easily applied in endoscopy
- Faster than traditional lab methods



Pharmaceutics

Development

In research and development of new pharmaceutics Raman spectroscopy helps studying and optimizing the interactions of active pharmaceutical ingredients with pathogens.

- Highest sensitivity to changes in chemistry
- Can be easily combined with microscopy
- Allows spatial component distribution analysis

Quality and process control

Raman spectroscopy has become one of the most popular techniques for identifying raw materials for pharmaceuticals and for monitoring compound distribution during manufacturing.

- Possible analysis through transparent containers
- Allows high throughput screening
- Enables in-line and non-destructive monitoring

Environmental

Aerosol particles

With the help of Raman spectroscopy, the pollution of air by aerosols can be analyzed. The chemical composition of aerosols can be precisely determined even at low concentrations.

- Even sub-micrometer particles can be analyzed
- Rapid identification by “fingerprint“ database
- Automated in situ measurements are possible

Microplastics

In addition to the chemical component analysis, Raman spectroscopy in conjunction with microscopy also provides detailed information about size, number and shape of microplastics.

- The measurement is not interfered by water
- Detects sizes of a few tens of micrometers
- Distinguishes different types of polymers easily

Mineralogy

Mineral composition

Raman spectroscopy not only enables unambiguous mineral identification, but also the investigation of complex microstructures, mineral distribution and phase transitions.

- Non-destructive measurement
- Extensive database of reference spectra
- Fast analysis by “fingerprint“ comparison

Crystal analysis

Taking into account not only the spectral information but also the polarization of Raman signals, crystals can be analyzed with regard to structure, symmetry and orientation.

- No sample preparation is required
- Micrometer spatial resolution is possible
- Stress and strain effects can be analyzed

Special Products for Demanding Applications

Lasers for Raman Spectroscopy

Stabilized single frequency lasers

- Wavelengths 532 nm to 1064 nm
- Optical powers up to 500 mW
- High stability and narrow linewidth
- Fiber-coupled for easy integration
- User-friendly plug&play

Raman Spectrometers

High-performance Raman spectrometers

- Cooled back-thinned CCD detector
- High dynamic range
- Ideal for ultra-low light level applications
- Acquires up to 140 spectra per second
- On-board data processing

Fiberoptic Raman Probes

High throughput Raman probes

- Focal lengths from 9.7 mm to 20 mm
- Available for all Raman wavelengths
- Interchangeable fibers
- Optimizable to match spectrometer specs
- Dual wavelength probe for concatenation

Raman Filters

Optical filters for Raman spectroscopy

- Highest transmission for Raman signal
- Deepest blocking of the laser line
- Steep filter edge
- Available for all Raman wavelengths
- Customized OEM versions available

Our All-Round Service (Solutions)

The comprehensive consulting for your project

Photonics is considered one of the most important technologies of the future. Products from that field of are finding their way into a steadily growing number of applications and are opening up new, innovative and efficient approaches to solutions. At the same time, however, photonics also confronts manufacturers, plant engineers and system integrators with new, major challenges.

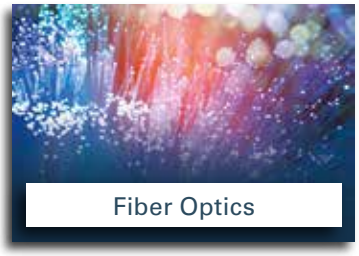
As a photonics expert, Laser 2000 supports you in your project. Our specialists with many years of experience advise you, show approaches to solutions, provide special concepts and accompany you with know-how from prototype development to series production.

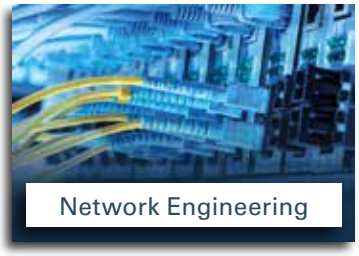
Our broad product and solution portfolio as well as our extensive expert knowledge enables our customers to face and successfully master new challenges in photonics.

All Photonics Products from a Single Source

Experts in Photonics

Since 1986, we have supported well over 100 international photonics manufacturers as a leading partner in covering the European market. In doing so, we are an important link between users, integrators and suppliers. Our success is based on our solution-oriented consulting, the close exchange with our partners as well as our profound product and application understanding.





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