

AvaRaman Fiber-optic Raman System

Raman spectroscopy is especially useful for reaction monitoring, product identification, remote sensing and the characterization of highly scattering particulate matter in aqueous solutions. Based on the principle discovered by Prof. Chandrasekhara Venkata Raman, it measures the result of the inelastic scattering of photons.

Avantes uses the high-sensitivity AvaSpec spectrometers in combination with a 532 nm, 633 nm or 785 nm laser to give you the best result for your Raman measurements. The spectrometers are appropriately configured according to the wavelength of the laser.

AvaRaman-TEC series spectrometers have a three-stage Peltier cooling systems, which provides ΔT down to -30°C cooling

to ambient for superior dark noise reduction, keeping the detector at a steady 5°C . Thanks to the PID controller, this temperature is stable within a 0.1°C bandwidth. All AvaRaman systems are delivered with special AvaSoft-Raman software. Complementary Panorama-Pro software is available for Raman interpretation and functional group assignment.

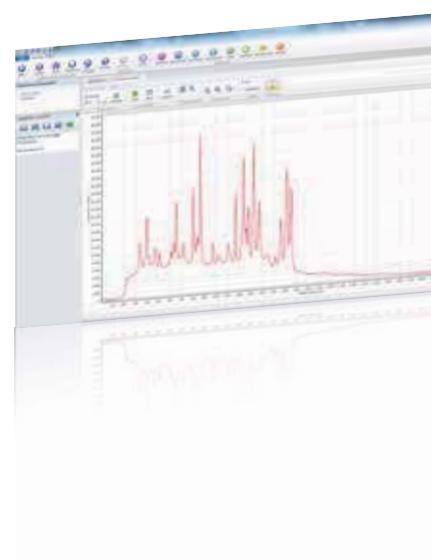
A selection of different probes is available to select the right one for your application. For more information on our software solutions including AvaSoft-Raman and Panorama-Pro, please refer to the software pages in this catalog.



Technical Data

	AvaRaman-532TEC	AvaRaman-785TEC
	Cooled	Cooled
Signal to noise Ratio	200:1 for Benzene	300:1 for Benzene
Resolution*	$\pm 6 \text{ cm}^{-1}$	$\pm 6 \text{ cm}^{-1}$
Spectrometer	AvaSpec-ULS2048L-TEC with grating NC (535-752 nm), slit-25, DCL-UV/VIS TE-cooled	AvaSpec-ULS2048L-TEC with grating SI (785-1080 nm), slit-25, DCL-UV/VIS-200 TE-cooled
Raman Shift	100-5400 cm^{-1}	100-3500 cm^{-1}
Laser output	532 nm, 50 mW	785 nm, 500 mW, Class 3b
Laser Wavelength	532 nm	785 nm
Laser Bandwidth	< 0.1 nm	< 0.2 nm
Dimensions housing	240 (L) x 140 (W) x 250 (H) mm	

* typical resolution: higher resolution possible on request



Pre-configured spectrometers can be shipped within 24 hours



AvaRaman probes

AvaRaman-PRB-XXX

3/8" SS low-cost focusing probe with a 200 μm excitation fiber and 400 μm read fiber. Multiple focal lengths available (5 mm, 7.5 mm (standard), 10 mm). It can withstand 80°C. Manual shutter included, 1.5 m fibers. Specify XXX=excitation wavelength

AvaRaman-PRB-FP-XXX

1/2" SS focusing probe with a 200 μm excitation fiber and 400 μm read fiber. Multiple focal lengths available (5 mm (standard), 7.5 mm, 10 mm). It can withstand 80°C. Specify XXX=excitation wavelength

AvaRaman-PRB-FIP-XXX

5/8" SS immersible focusing probe for in-situ measurements with a 200 μm excitation fiber and 400 μm read fiber. It can withstand 200°C. Specify XXX=excitation wavelength

AvaRaman-PRB-FC-XXX

3/8" SS immersible process probe for in-situ measurements with a 200 μm excitation fiber and 400 μm read fiber. It can withstand 500°C and 3000psi, the probe optics provide complete background filtering. Specify XXX=excitation wavelength

AvaRaman-532-TEC-USB2

Consisting of following elements:

- Solid state 500 mW laser 532 nm, FWHM 0.2 nm
- TE-cooled AvaSpec-ULS2048L-TEC-USB2 Spectrometer with 1200 lines/mm grating set 535-752 nm, 25 μm slit, DCL-UV/VIS
- AvaSoft-Raman stand-alone software for the AvaRaman system, AvaRaman-GL-532 laser safety goggles

AvaRaman-785TEC-USB2

Consisting of following elements:

- Solid state 500 mW laser 785 nm, FWHM 0.2 nm
- TE-cooled AvaSpec-ULS2048L-TEC-USB2 Spectrometer with 830 lines/mm grating set 785-1080 nm, 25 μm slit, DCL-UV/VIS-200
- AvaSoft-Raman stand-alone software for the AvaRaman system, AvaRaman-GL-785 laser safety goggles

Different Raman probes available, please see table above

Other accessories

AvaRaman-SH-3/8"

- Rugged sample holder for secure positioning of 3/8" Raman probes

AvaRaman-SH-1/2"

- Rugged sample holder for secure positioning of 1/2" Raman probes

AvaRaman-Calibrationtile

- PTFE White tile in holder for 3/8" Raman probe

AvaRaman Bundle



Type of measurements:

Raman techniques are used for many different materials. The Avantes bundles are really good for the use of powders and liquids. When strong signals are available (aromatic compounds, alcohol based liquids) in general Ava-Raman-A is useful to perform the measurement.

When weak Raman signals occur (Integration time longer than 5 seconds) the thermo-electric-cooled (TEC) spectrometer is recommended. This is added in the Ava-Raman-B.

For very weak signals (possibly together with fluorescence background) the Ava-Raman-C is recommended. Thanks to Higher quantum efficiency in NIR and better signal /noise performance.

NEW Avantes Raman Bundles

Raman Spectroscopy allows obtaining individual spectral 'fingerprints' of materials. Commonly used in chemistry, pharmaceutical and medical fields, to provide information by which molecules can be identified.

To offer our customers optimal performance for a reasonable price, Avantes joint forces with 2 partners to offer you a Raman Bundle consisting of a great spectrometer (3 different models), a unique Laser-Probe combination (785nm) supplying enhanced signals and an outstanding Software package to analyze the Raman spectra.

These 3 Bundles have in common:

For excitation:

AvaLaser785 (incl.: 785 nm laser safety goggles). It has an ultra-high throughput integrated Raman probe. This novel device includes an integrated wavelength stabilized laser source with Raman filter packs, beam shaping optics and high efficiency Raman spectra collection optics.

For Analysis:

Panorama-Light: Panorama Light is a modular, high-end software platform for spectroscopic data evaluation. The application meets all requirements for a comprehensive spectroscopy working environment, offering:

- Measurement with an instrument
- 2D & 3D data visualization
- Searching in libraries
- Archiving in spectral libraries, including additional information

For Detection:

We offer state of the art spectrometers based on the Avantes Star- and SensLine spectrometers, tailored for optimal performance in the Raman range of interest.

Ordering Information

AvaRaman-A

Based on an uncooled spectrometer this is the entry bundle for reasonable strong signals

- Range : 150 cm^{-1} - 3600 cm^{-1}
- Resolution: 6 cm^{-1}
- AvaSpec-ULS2048L-USB2 set for (788-1100nm), slit-25, DCL-UV/VIS200, FC-PC connector)
- Also including: AvaLaser785 (incl. probe), AvaRaman software: Panorama Light
- Optional: Replaceable slit (add -RS)

AvaRaman-B

Based on the cooled version of the spectrometer offered in the bundle Ava-Raman-A. Cooling enables you to work with longer integration times, yet keeping the thermal noise limited.

- Range : 150 cm^{-1} - 3600 cm^{-1}
- Resolution: 6 cm^{-1}
- AvaSpec-ULS2048L-TEC-USB2 set for (788-1100nm), slit-25, DCL-UV/VIS200, FC-PC connector)
- Also including: AvaLaser785 (incl. probe)
- AvaRaman software: Panorama Light
- Optional: Replaceable slit (add -RS)

AvaRaman-C

For the most demanding applications. The spectrometer used in this bundle makes use of a cooled spectrometer with a special low-noise Back-Thinned detector. Back thinned detectors have much better sensitivity in the NIR range (800-1160nm) in comparison to standard Si-detectors.

- Range : 150 cm^{-1} - 3600 cm^{-1}
- Resolution: 6 cm^{-1}
- AvaSpec-ULS2048x64TEC-USB2 set for (788-1100nm), slit-25, DCL-UV/VIS200, FC-PC connector)
- Also including: AvaLaser785 (incl. probe)
- AvaRaman software: Panorama Light
- Optional: Replaceable slit (add -RS)

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Raman spectroscopy:

- Analysis of liquids, powders, tablets, gels
- Measurements through transparent and semi-transparent packages

〒336-0017 埼玉県さいたま市南区南浦和 1-2-17
TEL: 048-871-0067 FAX: 048-871-0068
e-mail: voc@phototechnica.co.jp