

### 3. .Portable Dual-band Raman Spectrometer

If you feel uncertain to choose excitation wavelengths, such as 532, 785, 1064 nm in lab experiment, you may refer to comparison table as shown below:

Excitation Wavelength	Advantage	Disadvantage
532nm	High-efficient excitation, Short-term experiment	Fluorescence interference
1064nm	fluorescence noninterference Optimized penetrability Penetrate 3nm-thick plastic bucket	Expensive cost Low-efficient Raman excitation Long-term experiment
785nm	High performance Cost effective Competitive price High-efficient excitation	

ATR3200 & ATR3300 Portable Dual-band Raman Spectrometers feature a complete technique of non-contact, non-destructive, and requires no sample preparation. Available in 532, 785, and 1064 nm with single band (532, 785, 1064 nm) or dual band (532/1064, 785/1064 nm ) options. With high performance and sensitivity, they can be performed on very small samples and applied for identifying textile, organization, alcohol and crystal etc.

ATR3200 employs TE cooled, high-sensitivity and enhanced Raman signal CCD, high efficiency Raman probe, ultra-narrow linewidth laser at an output of 600mW. Combine reliable optical design with circuit and structure design, it provides stable results detected with high SN ratio.

ATR3300 employs deep cooled InGaAs array, ultra-narrow linewidth semiconductor laser with high performance and sensitivity, and it's especially applied for scientific search, medical instrument etc. Combine reliable and accurate results detected with extra low stray light, and it applies for a wide variety of fields including public safety, food safety, pharmaceutical analysis, gemstone identification, Calculir analysis etc.

The wavelength of 1064 nm can pass through 3 nm-thick opaque plastic bucket or dark container to detect internal chemical composition. This way of easy-to-operate process ensure operator safety as a result.

PN	Excitation Wavelength (dual bands)	
ATR3200	532nm	1064nm
ATR3300	785nm	1064nm
ATR3400	785nm	532nm

#### Application

- Scientific research
- Bioscience
- Forensic analysis
- Material science research

- Medical immunology
- Agricultural and food science
- Waste water analysis
- Gemstone and inorganic minerals identification
- Environmental science

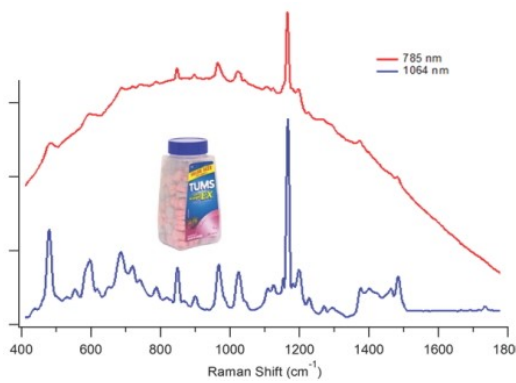
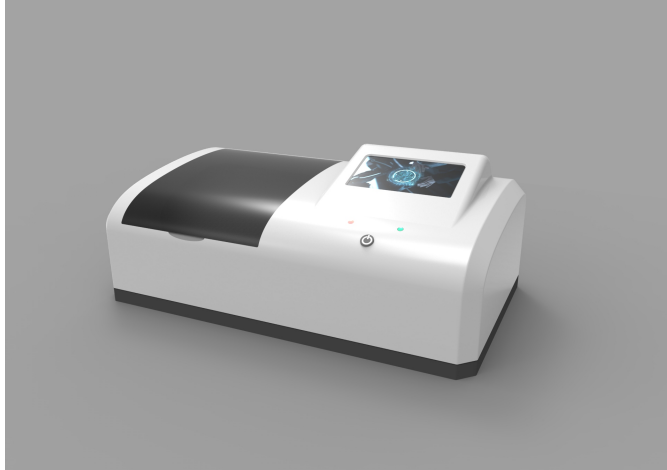


Fig 1. amoxicillin

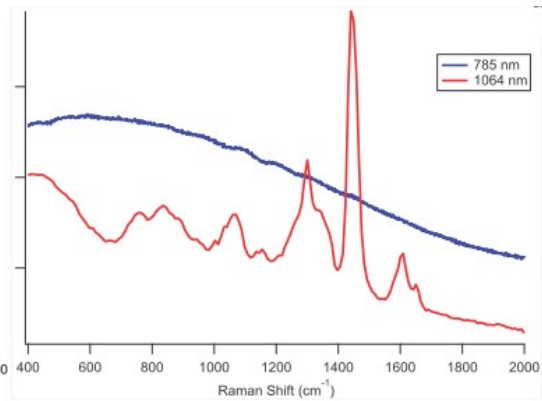


Fig 2. diesel fuel

	ATR3200	ATR3300	ATR3400
Excitation Wavelength	532nm and 1064nm	785nm and 1064nm	532nm and 785nm
Spectral range	532nm:250-2700 cm <sup>-1</sup> 1064nm:200-2400 cm <sup>-1</sup>	785nm:250-2700 cm <sup>-1</sup> 1064nm:200-2400 cm <sup>-1</sup>	532nm:250-2700 cm <sup>-1</sup> 785nm:250-2700 cm <sup>-1</sup>
Spectral resolution	532nm:8 cm <sup>-1</sup> 1064nm:10 cm <sup>-1</sup>	785nm:5 cm <sup>-1</sup> 1064nm:10 cm <sup>-1</sup>	532nm:8 cm <sup>-1</sup> 785nm:5 cm <sup>-1</sup>
SNR	532nm:3000:1 1064nm:8000:1	785nm:3000:1 1064nm:8000:1	532nm:3000:1 785nm:3000:1
Calibration of Wavenumber	Calibration in the factory		
Stray light	0.05%	0.05%	0.05%

Spectral stability	$\sigma/\mu < 0.5\%$ (COT 8 hours)		
<b>System parameters</b>			
Interface	USB 2.0		
Operation mode	Capacitive touchscreen or PC		
battery life	100 Wh Li-ion, continuous battery life >6 hours		
Integration time	4ms - 120s		
Voltage	DC 19V(+/-5%)		
Output	50W (Max.)		
Working temperature	-10~50 °C		
Humidity	< 95%		
Size (L*W*H)	350(d) x 296(w) x 172(h) mm		
Weight	6.5 Kg		
<b>Optical parameters</b>			
Slit	50 $\mu$ m		
optics	532nm:F/4 C-T 1064nm:F/4 C-T	785nm:F/4 C-T 1064nm:F/4 C-T	532nm:F/4 C-T 785nm:F/4 C-T
Focal length	532nm:98 mm for incidence and output 1064nm:127 mm for incidence and output	785nm:98 mm for incidence and output 1064nm:127 mm for incidence and output	532nm:98 mm for incidence and output 785nm:98 mm for incidence and output
Working space	6 mm	6 mm	6 mm
Blocking rate	OD>8	OD>8	OD>8
NA	0.3	0.3	0.3
Aperture diameter	7mm	7mm	7mm
<b>Laser source</b>			
Center wavelength	532nm:532 nm ( $\pm 0.5$ nm) 1064nm:1064 nm ( $\pm 0.5$ nm)	785nm:785 nm ( $\pm 0.5$ nm) 1064nm:1064 nm ( $\pm 0.5$ nm)	532nm:532 nm ( $\pm 0.5$ nm) 785nm:785 nm ( $\pm 0.5$ nm)
FWHM	532nm:0.1 nm 1064nm:0.08 nm	785nm:0.08 nm 1064nm:0.08 nm	532nm:0.1 nm 785nm:0.08 nm
Output	532nm:100 mW 1064nm:>550 mW	785nm:>550 mW 1064nm:>550 mW	532nm:100 mW 785nm:>550 mW
Power stability	532nm: $\sigma/\mu < \pm 0.7\%$ 1064nm: $\sigma/\mu < \pm 0.2\%$	785nm: $\sigma/\mu < \pm 0.2\%$ 1064nm: $\sigma/\mu < \pm 0.2\%$	532nm: $\sigma/\mu < \pm 0.7\%$ 785nm: $\sigma/\mu < \pm 0.2\%$

Detector			
Detector	532nm:2048 x 64 pixels TEC cooled back-thinned CCD; 1064nm:Linear 512 pixel TEC cooled InGaAs CCD	532nm:2048 x 64 pixels TEC cooled back-thinned CCD; 1064nm:Linear 512 pixel TEC cooled InGaAs CCD	532nm:2048 x 64 pixels TEC cooled back-thinned CCD; 785nm:2048 x 64 pixels TEC cooled back-thinned CCD;
Cooled	TEC down to -15°C		
Cooling time	1 minute		
Software			
Connectivity	USB2.0 or WIFI		
Trigger mode	Software trigger		
Laser output	Synchronous monochromator and laser		
OS	Win 7、 Win8、 Win10		
Spectral library	Optosky spectral library, users build a spectral library.		