

Integrated Raman Probe

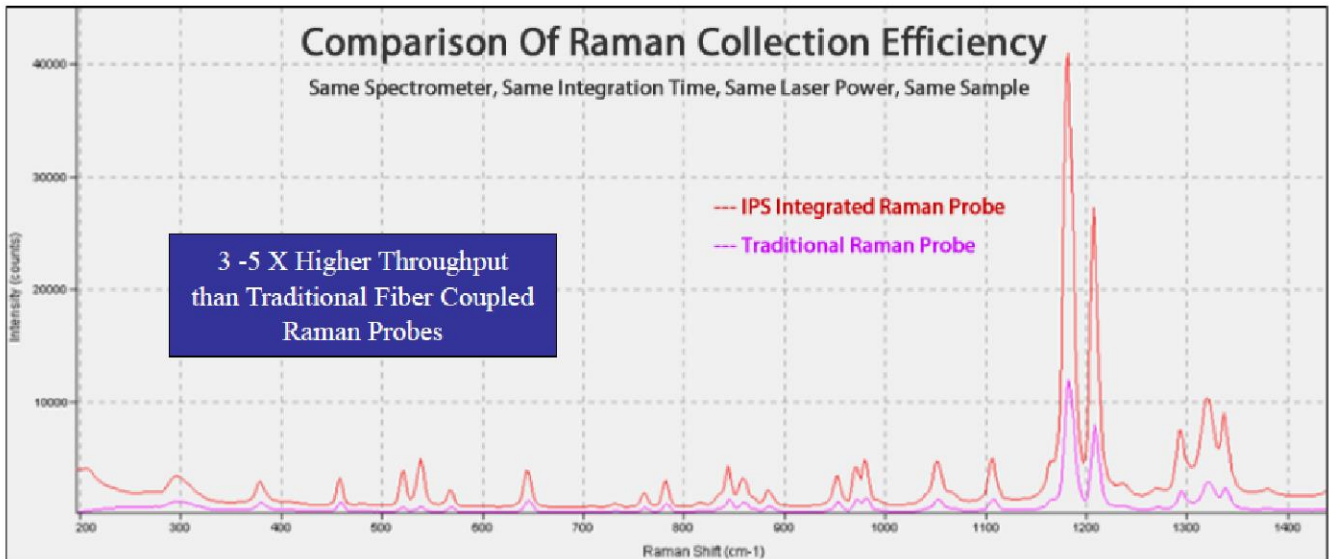


Features

- 3-5X Higher Throughput than Standard Raman Probes (sample dependent)
- 785 nm Standard Wavelength Stabilized Excitation Source (514.5 nm, 830 nm, 1064 nm available)
- High Throughput Optical Design with 65cm^{-1} Cut-on
- 4 mm Standard Working Distance (additional working distances available)
- Designed for OEM integration

An innovative ultra-high throughput Integrated Raman Probe has been introduced in the market by one of our associated companies in the US. This novel device includes an integrated wavelength stabilized laser source with Raman filter packs, beam shaping optics and high efficiency Raman spectra collection optics. The probe interfaces with any fiber coupled spectrometer.

The Integrated Raman Probe incorporates a wavelength stabilized hybrid external cavity laser with a proprietary optical design to offer unmatched performance (typically 3 - 5x higher collection efficiency over traditional Raman probes). This Integrated Raman probe also comes complete with an OEM laser driver & TEC controller.



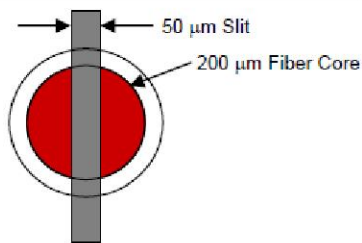
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The Integrated Raman Probe offers 3-5 times higher collection efficiency as compared to traditional fiber probe approaches by optimizing the probe design in the following manner:

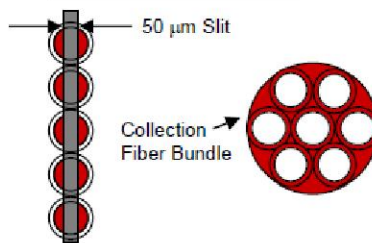
- It integrates the laser directly inside the probe head, eliminates fiber coupling losses and allows for beam shaping in order to optimize both laser power and power density on the sample which maximizes Raman signal.
- It utilizes a custom designed rectangular core fiber which increases both the coupling efficiency into both the fiber and the spectrometer

Comparison of Loss at Fiber/Slit Interface & at Entrance to Collection Fiber (circle to line)

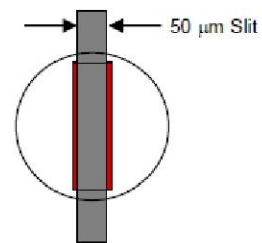
Traditional 200 micron core Fiber Probe



Circle to Line Collection



IPS Integrated Raman Probe Collection



Raman signal is vignetted (thrown away) or not collected in red shaded regions detailed above

Parameter	Unit
Excitation	Integral 785 nm wavelength stabilized laser <0.15 nm FWHM bandwidth (514.5 nm, 830 nm and 1064 nm available)
Collection	1.5 m long, proprietary high throughput fiber
Cut-on	65 cm-1 cut-on
Electronic Connection	10-pin Molex cable (53014-1010) with mating connector (51004-1000) on Laser Driver Module
Power Control	Analog (voltage bias on pin 8) or TTL modulation (Pin 7). Unit can be modulated at up to 1 kHz USB Laser control Unit (LCU-U) optional
Power Supply	3 A - 5 A max, 5VDC (not supplied)
Shaft Material	316L Stainless Steel
Working distance	3 mm, 4 mm, 6.5 mm, and 9 mm standard (+/- 0.5 mm) - Custom distances available upon request
Fiber Bend Radius	4 inches
Operating Temperature	10 degrees C to 40 degrees C
Storage Temperature	- 20 degrees C to + 80 degrees C
Humidity	0 - 80% non-condensing

Parameter	Unit	Min	Typ	Max	Notes
Output power stability	%		± 1		
Peak wavelength	nm	784.5	785	785.5	
3 dB bandwidth (FWHM)	nm		0.1	0.15	
Operating Temperature Range (Case)	Deg C	10		40	Case Temperature
Power Consumption	W		3	7	Case temp between 10 and 40 deg C
Wavelength Stability	Seconds			180	Cold Start - to < 1 wavenumber
				1	Warm Start - to < 1 wavenumber
				3	Warm Start - to < 0.1 wavenumber
Absolute Maximum Ratings					
Laser Module Operational Current	A		1	3	
Laser Module Operational Voltage	V	4.9	5	5.1	Compliance