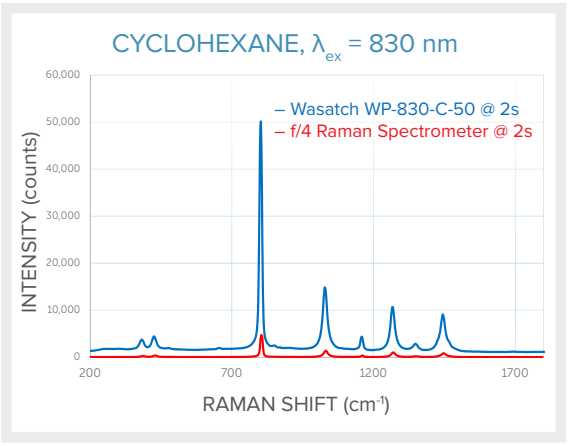
Why Wasatch for Raman

Too often, a Raman spectrometer's data sheet doesn't tell you what you really want to know. Is it sensitive enough? Does it produce clean spectra? Is it robust enough for OEM use? While every application is unique, we can share some benchmark data to show you how we outperform the competition, and why.

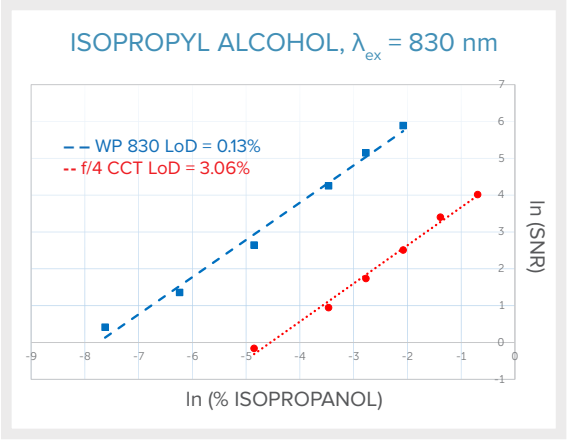
When we created our Raman spectrometers, we designed the optics we would want as spectroscopists, supported by the mechanics we know our OEM customers need. The result is a robust opto-mechanical design in a compact footprint, electronic interfaces that match use cases for academic, industry and OEMs alike, and – most importantly – the ability to capture every possible photon through elegant optical design.

We place one of our own perfectly matched, patented volume phase holographic (VPH) gratings at the heart of every spectrometer. With uniform response and low loss, these gratings enable a compact and highly efficient transmissive optical design that minimizes aberrations and alignment sensitivity for the optimum in manufacturability and thermal stability. The result? More than 10x better performance for Raman than a high-end f/4 crossed Czerny-Turner (CCT) spectrometer, and far less variability.



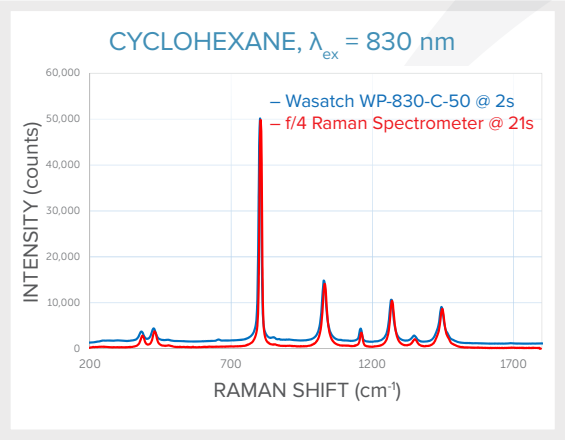
>10x BETTER SENSITIVITY

Photons are precious, particularly in Raman spectroscopy, which is why we designed and built an optical bench that allows you to capture, keep and detect more photons. For cyclohexane excited at 830 nm at a fixed integration time of 2 seconds, our WP 830 Raman spectrometer with TEC cooling detects 10x more signal than the a similarly configured f/4 CCT spectrometer with twice the slit size. Access new applications and take your most challenging Raman measurements to the field with our high sensitivity.



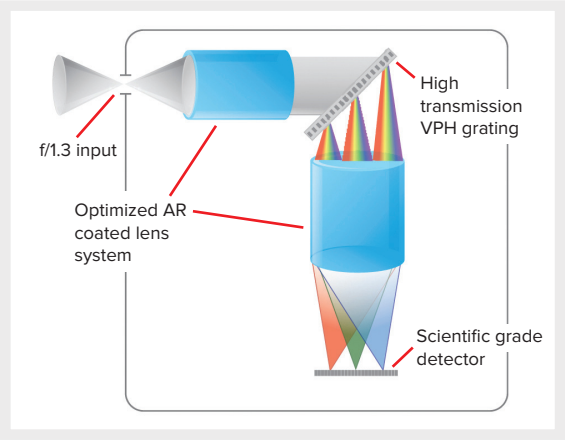
TRACE-LEVEL LIMIT OF DETECTION

Increased sensitivity allows you to significantly improve the limit of detection (LOD) of your experiment. As a benchmark, we looked at spectra for six dilutions of isopropyl alcohol in water, from 12.5% down to 0.05%. Defining LOD as SNR=3, our WP 830 cooled Raman spectrometer is able to detect concentrations as low as 0.13%, as compared to 3.06% for an f/4 CCT spectrometer. With a >20x advantage in LOD, we can help you see lower concentrations of samples than ever before, without compromising on size or cost.



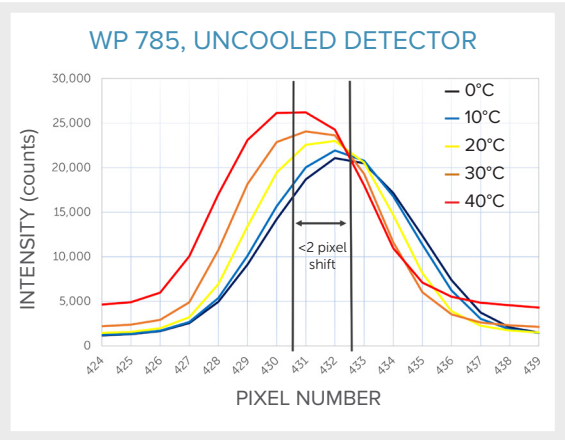
TAKE SPECTRA IN <1/10th THE TIME

Count on our spectrometers to reduce your acquisition time significantly. In a head-to-head comparison of Raman spectra of cyclohexane excited using a 28 mW, 830 nm laser, the WP 830 delivered a strong signal in just 2 seconds, while an f/4 CCT spectrometer with twice the slit size needed 21 seconds to achieve the same signal intensity. From high throughput quality monitoring to handheld measurements and trace detection, our spectrometers give you the answers you need in a fraction of the time.



SUPERIOR STRAY LIGHT SUPPRESSION

Off-axis stray light degrades spectral quality and SNR and affects LOD, which is why we use a transmissive design and aberration-corrected optics to detect every possible photon. Our VPH gratings offer up to 40% higher efficiency, more uniform response with wavelength and polarization, and ultra-low scatter compared to reflective gratings. When tested against a TEC-cooled f/4 CCT spectrometer using a 900 nm long pass filter, our WP 830 showed half as much stray light – just 0.007% – for superior Raman performance.



EXCELLENT THERMAL STABILITY

A Raman spectrometer must perform reliably across a wide range of environmental conditions to avoid recalibration or compensation. To validate our opto-mechanical design, we monitored Xe spectra for our WP 785 spectrometer during temperature cycling, finding thermal shift to be <2 pixels over 0-40°C, half that of a typical f/4 CCT spectrometer. Our peaks also remain highly symmetric with temperature, giving you the thermal stability you need to achieve high accuracy in Raman spectral and library matching algorithms.

APPLICATIONS EXPERTISE

The inherent high efficiency, low LOD and excellent thermal stability of our spectrometers enable the most challenging Raman applications, from trace level detection to real-time process control. Our team has worked with leading research groups and companies in the use of Raman for authentication, food, gemstone analysis and pharma, and can offer you the expertise needed to make your R&D or product development successful.

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