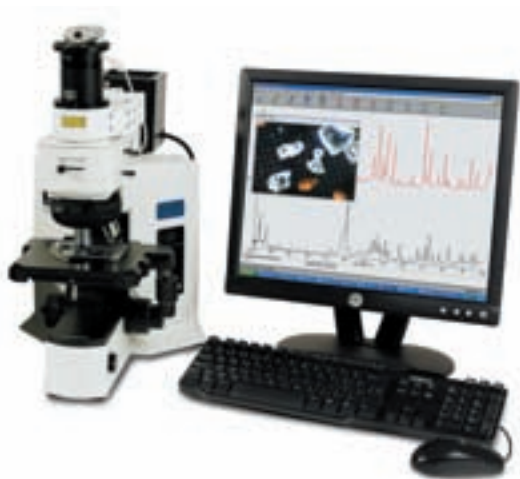


Technical Specifications for the RamanMicro 200 and 200F Raman Microscope



INTRODUCTION

The PerkinElmer® RamanMicro™ 200 is a dispersive Raman microscope offering push button ease-of-use.

The RamanMicro 200 is based around a high performance microscope and is ideal for routine sample analysis, sample identification and advanced analysis, such as chemical imaging.

All systems are equipped with a high performance line-narrowed 785 nm laser and a Charge Coupled Device detector (CCD) cooled to -50 °C. There is an optional motorized stage with joystick for line scanning and mapping. The RamanMicro 200F can be fitted with a fiber optic probe, ideal for remote sampling and reaction monitoring.

A powerful data acquisition and analysis suite includes Spectrum™ software for instrument control and spectral data processing, Quant+™ software for the generation of quantitative calibration models, and SpectrumIMAGE™ software provides the interface for chemical imaging.

TECHNICAL DESCRIPTION AND SPECIFICATIONS

Optical Performance

Excitation source	Near infrared 785 nm laser, 350 mW (80 mW at sample, objective dependent)
Spectral range	95-3200 cm ⁻¹
Peak resolution	< 10 cm ⁻¹ FWHM, (measured as calcite Full Width Half Maximum)
Pixel resolution	3 cm ⁻¹ , average dispersion across spectral range
Laser spot size	10 micron laser spot size, when using 100x objective

Microscope Platform

Microscope	Olympus® BX51 Reflected Illumination Frame
Lamp	100 W Halogen Lamp, front mounted intensity control dial, user-adjustable photo preset switch, LED voltage indicator lights
Objective lenses	5x, 20x and 50x objective lenses provided as standard, 100x objective available as optional extra. Long working distance objective lens upgrade kit also available.
Nosepiece	Quadruple lens centering bright field nosepiece
Video camera	USB video camera for sample alignment

Stage Options	Manual Stage	Standard Motorized Stage	Multi-well Sample Stage
Range of motion XY	75 x 50 mm (3 x 2 in)	75 x 50 mm (3 x 2 in)	114 x 75 mm (4.5 x 3 in)
Accuracy XY	Verniers scale	Stage movement accuracy of 0.1 µ	Stage movement accuracy of 0.1 µ
Drive control XY	Rackless, coarse and fine manual adjustment, tension adjustment mechanism	Joystick for XY sample adjustment	Joystick for XY sample adjustment
Accuracy Z	Fine stroke 100 µm per rotation, 1µm gradation	Stage movement accuracy of 0.1 µ	Stage movement accuracy of 0.1 µ
Drive control Z	Rack and pinion, coarse and fine manual adjustment, tension adjustment mechanism	Joystick for Z focus adjustment	Joystick for Z focus adjustment

Accessories

General	Quartz microscope slides offer a low background and are ideal for mounting thin samples
Micro-sampling tool kit	Consists of sampling tools specifically designed for manipulating and preparing microsamples. The kit includes pin vice, micro needle, stainless steel tweezers, dissecting forceps, razor knife and straight stainless-steel micro probe. This kit is provided as standard with the RamanMicro 200.
Power sampling kit	Stage mounted tablet autosampler accessory. Provided with 11, 15 and 22 mm diameter tablet holders. Compatible with PerkinElmer Tablet Autosampler molds for accommodating irregular shaped samples. Compatible with Leica® EM Trim supports for depth profiling. Standard and large stage versions available.
Tablet sampling kit	Stage mounted accessory accepts stainless steel sample cups. Provided with cup filler. Standard and large stage versions available.
Hot stage	Heating block and a temperature controller. The heating block contains an integral thermocouple; the temperature is digitally displayed in degrees Centigrade on the controller. The hot stage can heat samples up to 230 °C in 1 °C increments. A target temperature may be selected and maintained. The hot stage is held in the slide clip on the sample stage of manual and motorized sample stages.

Fiber Optic Probe (Optional Upgrade 200F only)

General	Switching from microscope to fiber optic probe is provided under software control. Data quoted here refers to the standard Raman probe. See Raman Fiber Optic Probes Technical Specifications
Probe cable	5 m, armor clad with stainless steel
Probe head length	150 mm
Probe head diameter	12.7 mm
Working distance	7.5 mm
Probe spectral range	230-3,500 cm^{-1} Raman shift
Max temperature	80 °C
Upgrade options	Optional immersion sleeve for liquid immersion measurements Additional lengths of fiber optic cabling are available for use in environments where the sample is located at a distance from the spectrometer. A range of high temperature and high pressure probes is also available.

Bench Details

Size	500 x 440 x 195 mm (spectrometer), 587 x 320 x 580 mm (microscope)
Weight	35 Kgs (spectrometer), 20 Kgs (microscope)
Laser class	RamanMicro 200 and 200F are Class 3b laser devices, and appropriate laser safety precautions should be observed.
Power requirements	110/240 VAC, 50/60 Hz (<50 W Typical)

Software

Spectrum Software for spectral data acquisition and analysis

General	A single software platform incorporates all of the functions required for Raman data acquisition and processing – instrument control, data manipulation and analysis, and flexible report utilities. A suite of optional software packages provide advanced capabilities or functions designed for specific application areas.
User interface	Password-protected user login function. Access to methods and routines, menu, toolbar and toolbox functions can be controlled by a supervisor.
Reports	Quick print facility for graphs, spectra and results windows. User defined templates can be created to enable custom printed and electronic reports.
Processing	1st-4th derivative with a variable filter, smooth (Savitsky-Golay, moving average and triangular), difference, normalization, baseline correction, deconvolution, apex, interpolate, peak table, peak height and peak area.
Materials testing	Patented COMPARE™ spectral comparison algorithm and Euclidean searching available. Spectral searching against commercially available or customer developed libraries.
Quantitative analysis	Single frequency, method development software. Spectrum includes Beer's Law, PLS and PCR quantitative prediction.
Validation	Software allows performance verification to ASTM standards. Comprehensive IQ/OQ documentation and services available.
System diagnostics	Key microscope and instrument components are checked on startup. Status of all RamanMicro components are displayed via PC control toolbox.

SpectrumIMAGE Software for Chemical Imaging, provided with Motorized Stage based systems.

Image presentation	Chemical images can be generated from spectral analysis using average intensity, single wavenumber, ChemiMap, Band Ratio, Quant+ result or COMPARE correlation, or by using show structure. Images can be viewed in false color, 3D projection or contour map.
Show structure	Single-click button operation to automate contrast enhancement in collected images by identifying and revealing true spectral differences.

Optional Software

Quant+	Powerful chemometrics calibration building software.
Spectrum Insight	Quantitative high throughput screening and reaction monitoring. Insight works hand in hand with Quant+. Collected data is send to Quant+ which provides quantitative information, this information is displayed in a simple to understand format, depending on the type of data collected, Insight can represent the data in several ways: <ul style="list-style-type: none">• High throughput mode: data shown in multiwell view using false color, grey scale or Red /Green (Pass/Fail).• Reaction monitoring: multiple concentrations to be viewed in graph format, screen is updated in real time.• Spreadsheet: Data is presented in a spreadsheet format (compatible Microsoft® Excel®).

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