

DXR3 Flex Raman Spectrometer

Research-grade Raman performance in a compact and configurable package

The Thermo Scientific™ DXR3 Flex Raman Spectrometer is specifically designed to bring research-grade measurements to your most challenging analytical applications.

While it can be used as a standalone Raman spectrometer for measuring both macro- and micro-samples, it can also be coupled to other analytical equipment, lending chemical composition and structural information to multi-modal analysis. Its compact footprint and flexible accessories allow the DXR3 Flex Raman Spectrometer to be operated in locations and scenarios that are inaccessible to most laboratory instrumentation.



DXR3 Flex Raman Spectrometer coupled with a Thermo Scientific HAAKE™ MARS™ Rheometer.



DXR3 Flex Raman Spectrometer equipped with fiber optic launcher accessory for fiber probe based measurements.



DXR3 Flex Raman spectrometer equipped with micro-stage sampling accessory for point-and-shoot measurement.

Powerful performance in a compact form factor—bring the power of Raman to your applications

A research-grade Raman “engine” that easily adjusts to your analysis needs:

- Multi-modal analysis
- Art and conservation
- Forensics
- Military
- Laboratory-reaction and process monitoring
- Fiber-probe-based measurements
- Defect analysis on large or small components
- Laboratory, tabletop, or rackmount

Features that deliver research-grade results:

- Quality and sensitivity of the DXR3 family of Raman instruments
- Multiple, changeable laser selections enhance measurement capability
- Robust, high-throughput, 1-box solution
- Wide range of processing and library capabilities with the Thermo Scientific OMNIC™ Software suite
- Easy to pack and move with the available travel case

DXR3 Flex Raman Spectrometer

- Based on DXR3 Raman components
- Interfaces to other instruments by free space coupling
- Sampling accessories allow the instrument to adapt to a wide range of measurement needs
- Fiber-probe coupling for measuring samples inside containers and packaging, and for monitoring laboratory processes/reactions
- Interchangeable lasers, gratings, and filters to optimize Raman signal

Physical dimensions

Width	29 cm
Depth	44 cm
Height	37 cm
Weight	22 kg

Spectrograph

Design	Patented triplet spectrograph	No moving parts
Spectral dispersion	Full-range grating	Average 2 cm ⁻¹ / CCD pixel element
	High-resolution grating	Average 1 cm ⁻¹ / CCD pixel element
Aperture	Four software selectable apertures	<ul style="list-style-type: none"> • 25 and 50 μm confocal pinhole apertures; • 25 and 50 μm slit apertures



DXR3 Flex Raman Spectrometer and accessories packed in a travel case.



DXR3 Flex Raman Spectrometer coupled with a Thermo Scientific Nexsa G2 X-Ray Photoelectron Spectrometer (XPS) System.

DXR3 family shared component specifications

The DXR3 Flex Raman Spectrometer is based on the same reliable research-grade design as our other DXR3 benchtop and microscope systems, providing robust performance while allowing you to easily exchange pre-aligned laser, filter, and grating components in the spectrometer.



A laser frequency set consisting of user-replaceable filter, laser and filter.

General system features

Lasers	Multiple excitation lasers	Supported wavelengths: 455, 532, 633, and 785 nm
	Laser safety	Class 3B
	Laser power regulator	Active feedback system to control absolute laser power delivered to the sample
General	System alignment	Automatically optimized after component exchange or on-demand
	Fine laser power control	Power controlled and reported at samples in 0.1 mW increments
Replaceable components	Smart components	Pre-aligned user-exchangeable system components (lasers, filters, gratings) lock into place and are automatically optimized with an internal calibration tool
		Software checks for laser, grating, and filter compatibility
		Software restores alignment and calibration settings when components are exchanged
Computer interface		Instrument communicates with single USB 2.0 connector (camera accessory communicates with a separate USB 2.0 connector)



Lasers.



Gratings.



Filters.

Lasers

Lasers	455 nm	532 nm high brightness	532 nm high power	633 nm high power	785 nm high brightness	785 nm high power
Maximum power at beam exit port (mW)	6	10	40	25	24	150
Center wavelength (nm)	455 ± 0.2	532 ± 1	532.3 ± 0.3	632.3 ± 0.25	785 ± 0.2	785 ± 0.5
Transverse mode	TEM ₀₀	TEM ₀₀	TEM ₀₀	TEM ₀₀	TEM ₀₀	Multi-mode
Beam quality (M ²)	<1.5	<1.3	<1.05	<1.5	<1.5	N/A

System performance - special range and resolution

Lasers		455 nm	532 nm	633 nm	785 nm
Full range	Resolution ¹ at FWHM (cm ⁻¹)	5.0	5.0	5.0	5.0
	Upper cutoff (cm ⁻¹)	3500	3500	3500	3300
	Lower cutoff ² (cm ⁻¹)	85	50	50	50
High resolution	Resolution at FWHM (cm ⁻¹)		2.0	2.0	2.0
	Upper cutoff (cm ⁻¹)		1800	1800	1800
	Lower cutoff (cm ⁻¹)		50	50	50
Extended range	Resolution (cm ⁻¹)		11.0		
	Upper cutoff (cm ⁻¹)		6000		
	Lower cutoff (cm ⁻¹)		50		

1: The system spectral resolution is measured using ASTM Method E-2529-06. The difference between system spectral resolution and spectrograph resolution is primarily determined by the excitation bandwidth.

2: 50% maximum transmitted power.

All specifications are guaranteed at beam exit port unless otherwise specified

Fiber optics specifications

Probe type	Available wavelengths (cm ⁻¹)	Probe tip diameter	Probe tip type	Fiber material
Standard probe	532, 785	1/2"	Cylindrical	Low-OH silica
Immersion probe	532, 785	5/8"	Cylindrical	Low-OH silica
Reaction probe	532, 785	5/8"	Cylindrical	Low-OH silica

Note: Fiber optic probes for laboratory settings only. Fiber optic connector type: FC/PC.

Instrument alignment, calibration, and optimization

Alignment and calibration ³	Entirely software controlled	Auto-alignment technique aligns laser and Raman emission
	Wavelength	Software-controlled calibration using multiple neon emission lines
	Laser frequency	Software-controlled calibration using multiple polystyrene Raman peaks
	Intensity	Software-controlled calibration using standardized white light source
Automatic x-axis calibration		Recurring, fixed-interval wavelength calibration eliminating manual calibration
Laser power regulator		Absolute excitation laser power at the sample controlled by OMNIC Software (Laser power at sample reported in mW)
Automatic fluorescence correction		Compensates for fluorescence prior to data analysis
Smart Background		Automatically accounts for background noise, improving spectral quality

3: Standards incorporated into patented alignment tool.

Instrument serviceability

Replacement lasers	Can be installed by user
Instrument performance monitoring	Software provides real-time status of system readiness, including error condition checks and diagnostics
Additional laser, filter, grating sets	Can be installed by user

Other specifications

Environmental	Minimum temperature: 16°C
	Maximum temperature: 27°C
	Humidity range: 20-80%
Electrical	100-240 V AC, 47-63 Hz
Regulatory	CE, UL/CSA/ETL, 21 CFR1040.10
Warranty	12-month warranty standard, extended warranties available

The DXR3 Flex Raman Spectrometer is a class 3B laser product.

Learn more at thermofisher.com/flex

thermo scientific

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