FT/IR-4X

Fourier Transform Infrared Spectrometer

DOMINIQUE DUTSCHER SAS



Performance
Innovation
Reliability



JASCO developed the first infrared spectrophotometer, the DS-101, in 1954. Since then, we have developed a long line of innovative products that has led us to the new compact FT/IR-4X (footprint only 386 mm W × 479 mm D), and a 30 % reduction in power consumption. The 4X has functionality and expandability only seen in research grade instruments, for wavelength resolution, signal-to-noise, multiple detectors, expansion of the measurement range, rapid scanning and IR microscopy (including linear array).

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A Compact, Powerful, Research-Grade Tool

Specially controlled diode laser

- Compact, long-life diode laser with excellent wavenumber precision

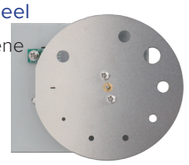


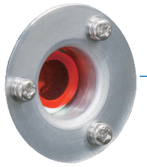
Automatic aperture wheel

- Set automatically for selected resolution

Automatic validation wheel

- NIST traceable polystyrene
- Automatic daily performance check





KRS-5 window

- Moisture-resistant KRS-5 interferometer window



FT/IR-4X + IRT-7200
linear array microscope

Can be used with IR microscope

- Compatible with JASCO IRT-5000/7000 Series*

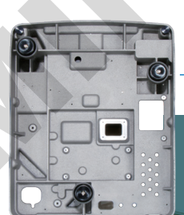
Full size sample compartment

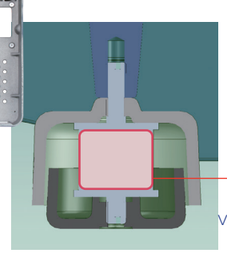
- Use with accessoried up to 200 mm wide
- iQX recognition automatically sets measurement parameters
- Smart Purge enables purging of compatible accessories
- Easily removal of sample compartment lid



FT/IR-4X + 12 m Gas cell







Optical base

- Ribbed aluminum casting optical base with vibration-proof mounting
- Stable measurement over a long period

Vibration-proof materials

Leg structure



Long life and high-intensity ceramic source

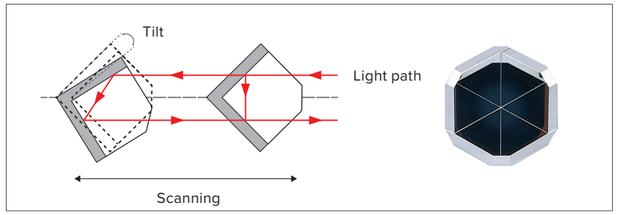
- Optional halogen lamp
- Automatic switching

Sealed interferometer

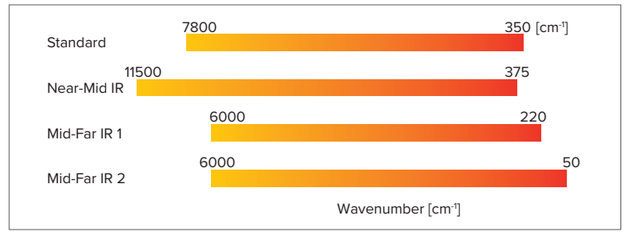
- 45° Michelson interferometer
- High-throughput Ge/KBr beam splitter
- Accurate moving-mirror control using DSP
- Continuous temperature and humidity monitoring
- Only replace desiccants as needed

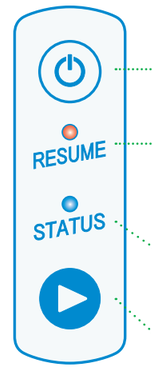
Corner-cube mirrors

- Corner-cube mirrors automatically correct for light path deviation



Optional wavenumber measurement ranges





Control panel

- Power switch
- Resume indicator
  Power on to the Resume state for immediate stable measurement
- Status indicator
- Start button
  Press to start sample measurement



High sensitivity cooled DLATGS detector

- Peltier element maintains optimum temperature to maximize performance
- Non-hygroscopic KRS-5 detector window



FT/IR-4X + MCT detector

External detector

- Automatic selection of a second detector (MCT, InGaAs, etc)
- Interchangable external detectors

*can only be used with JASCO IR Micro

DOWNLOADED FROM BUTCHER SAS

Measurement Accessories

ATR PRO 4X

ATR-Pro4X is fully integrated, but can easily be exchanged with other sampling accessories. The external design is easy to clean with a fully rotatable (360 deg) anvil for full access when placing samples onto the prism. The prisms are matched to the high pressure anvil (up to 10,000psi) with a slip clutch that prevents damage to softer prism materials. The choice of single reflection ATRs include monolithic diamond with anti-reflection coating for high throughput and wide range (a non-coated version is available for far-IR applications), ZnSe and germanium for highly absorbing black carbon loaded materials.



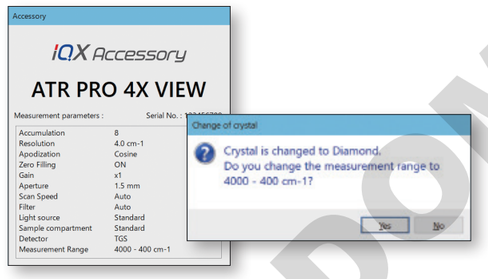
Prisms
- Diamond
- Se
- ZnSe

View and record your samples

The ATR Pro 4X View has the same features as the Pro 4X, but also includes a viewing lens and camera to observe the sample directly through the prism crystal. Confirm the quality of contact, identify the actual measurement position of the sample, and record an image with the saved spectrum.

When the prism is exchanged the crystal material is automatically recognized from its spectrum

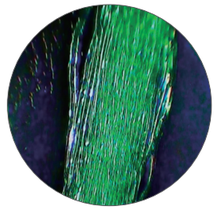
iQX automatically recognizes accessory and activates the measurement parameters used last time.







Unrestricted access to the ATR prism enables measurement of large samples.



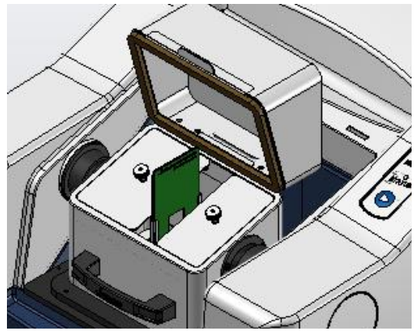
A high-resolution camera for recording sample images with excellent clarity

The FT/IR-4X has a compact design with small footprint, but retains a sample compartment large enough to take a full range of accessories.



Comparison with conventional models
(FT/IR-4000 series)
It saves about 40 % of the space in the installation area.

Optional Sample Compartments



TSC-4X
Small and purgeable for transmittance measurements

The reduced volume of the internal sample compartment improves the purge time and reduces consumption of purge gas. The effects of atmospheric gases are also reduced when used in non-purge mode.



ESC-4X

Optional sample compartment for large accessories up to 260 (D) x 185 (H) mm

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Expand the measurement range from NIR to FAR

The standard Mid IR is typically defined from 7,800 to 350 cm^{-1}. But with the development of new beam-splitter materials the measurement range of the FT/IR-4X can be dramatically expanded from the NIR to MIR, or from the MIR to the FIR. The light source, beam splitter, interferometer window and detector can be selected to optimize each measurement range.

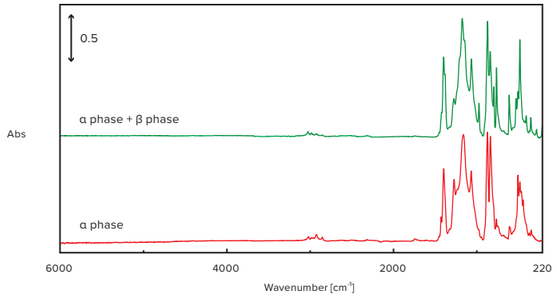
Near IR	Quantitative analysis with chemometrics / Film thickness measurement Optical property measurement
Mid IR	Qualitative analysis / Identification analysis / Partial quantitative analysis
Far IR	Crystal structure analysis / Inorganic sample analysis

Wavenumber Ranges

NMIR-4X : Near to Mid IR 11,500 - 375 cm^{-1}

MFIR-4X-N : Mid to Far IR 6,000 - 220 cm^{-1}

MFIR-4X-W : Mid to Far IR 6,000 - 50^{-1}

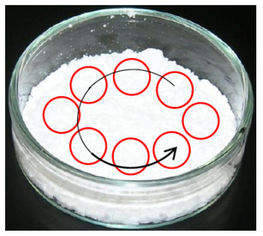


Measurement for PVDF in Mid-Far IR range

Examples of applications that require an extended wavenumber range

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Example of Near IR Analysis in Pharma



Quantification of multi-component mixed sample analysis using chemometrics

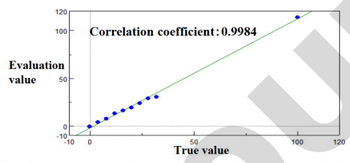
Mixed powder sample:

Ethenzamide and lactose hydrate mixed in the range of 4: 96 to 32:64 in 4% increments..

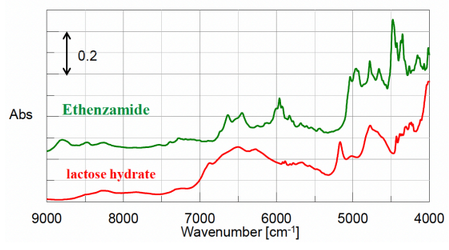
Measurement:

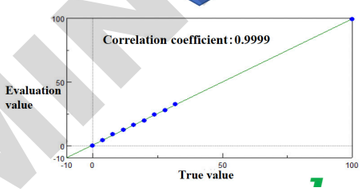
Rotate the petri dish to allow for spatial average in the variation in mixing.

Quantitative method: Partial Least Squares (PLS)



Calibration curve of ethenzamide created by measuring the sample at each area (red circle)



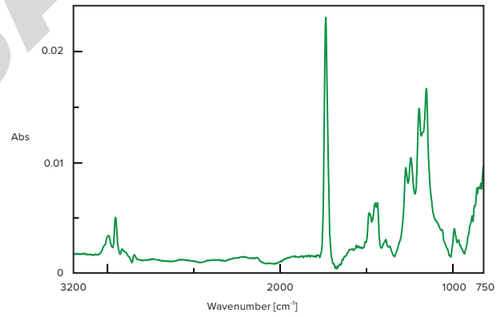


Calibration curve of ethenzamide prepared by averaging 16 measurements at each sample position.

Optional Detectors

A optional range of user exchangeable detectors can be used to change wavenumber range and sensitivity (including MCT, InGaAs).

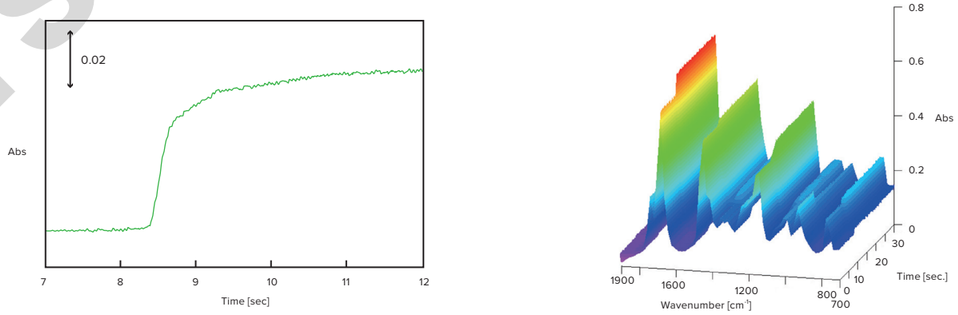




RAS measurement of PMMA thin film with MCT detector

Rapid Scan Option

Optional rapid-scan measurement at up to 80 Hz. (16 cm-1 resolution) can be used to monitor kinetic reactions at high speed.



Reaction process of the UV-curing resin (using the MCT detector)

	25000	15000	5000	1000	400	20 (cm^{-1})
Light source	Halogen lamp (25,000 - 2,200)					
						High-intensity ceramic source (7,800 - 20)
Beam splitter	Quartz broad band (25,000 - 4,000)					
		Si/CaF_2 (15,000 - 1,200)				
			KBr broad band (12,000 - 375)			
				Ge/KBr (7,800 - 350)		
				Mid-far IR broad band (6,000 - 20)		
					Mylar broad band (680 - 30)	
					Mylar 5 um (630 - 150)	
					Mylar 12 um (240 - 50)	
					Mylar 25 um (110 - 20)	
					Mylar 50 um (60 - 20)	
Detector	Si Photodiode (visible) (25,000 - 10,000)					
		Si Photodiode (NIR) (15,000 - 8,600)				
		InGaAs (11,500 - 4,000)				
		InSb (11,500 - 1,850)				
			MCT-N (5,000 - 750)			
			MCT-M (11,500 - 650)			
			MCT-W (11,500 - 450)			
			DLATGS (Mid IR) (15,000 - 350)			
			DLATGS (Far IR) (15,000 - 220)			
			DLATGS (Broad band) (15,000 - 30)			
					DLATGS (PE window) (700 - 30)	
					Si Bolometer (650 - 20)	
Window		Diamond (25,000 - 20)				
		CaF_2 (25,000 - 1,200)				
			KRS-5 (Mid IR) (15,000 - 350)			
			KRS-5 (Far IR) (15,000 - 220)			
					PE (700 - 20)	
Mirror		Al coating (25,000 - 20)				
		Au coating (19,000 - 20)				

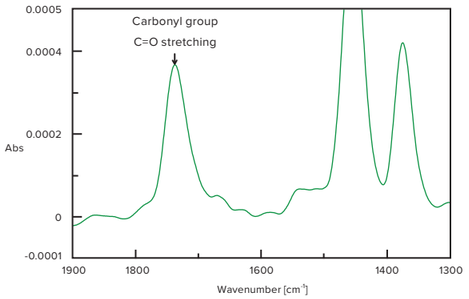
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Performance

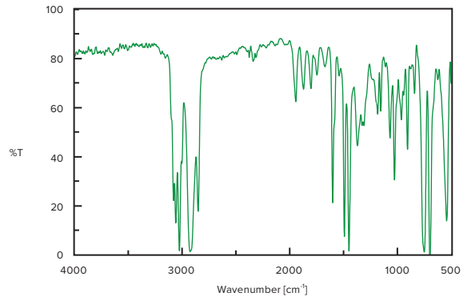
Excellent S/N Ratio

The standard FT/IR Pro 4X includes many novel features for fast measurement of small or low concentration samples and for IR microscopy measurement with high sensitivity. These include a 24-bit A/D converter, low-noise electrical system, a high-intensity ceramic light source, peltier cooled DLaTGS detector and a high-throughput optical system all contribute to an excellent signal to noise (S/N) of 35,000 : 1*. Higher S/N can be achieved using the optional MCT and InGaAs detectors.

**Under standardized parameters.*



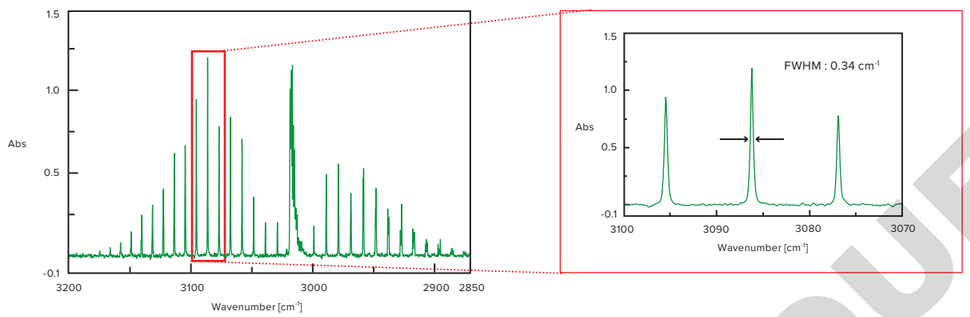
Coating on food packaging wrap film (ATR measurement)



PS film with φ0.5 mm size (Transmittance measurement)

High Resolution

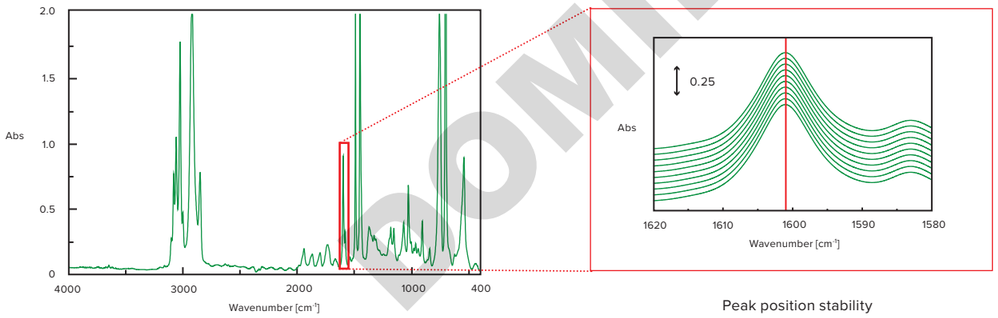
Resolution can be measured down to 0.4 cm-1 ideal for gas analysis and quantitation. The light path aperture is automatically set to the optimal size for spectral resolution.



Transmittance spectrum of CH_4 (methane) gas (using a 10 cm gas cell)

Exceptional Wavenumber Precision

The specially controlled diode laser (VCSEL) has an extremely long and stable lifetime and contributes to the downsizing of the instrument. By oscillating the laser with high precision using XLD, the FT/IR-4X has a wavenumber precision of 0.0005 cm-1 comparable what can be achieved with a HeNe laser.



PS film data (overlaid 10 measurement spectra)

Peak position stability
(Stacked display of 10 measurement spectra)

COMMERCIALISATION DU



SPECTRA MANAGER™

A SINGLE PLATFORM FOR EVERY INSTRUMENT.

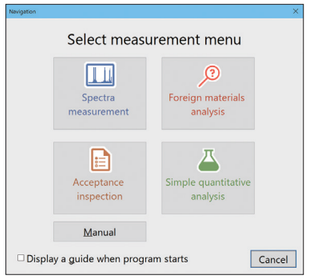
JASCO has developed the unique and powerful, cross-platform Windows® software package to control the widest range of optical spectroscopy instrumentation. Spectra Manager™ is a comprehensive lab companion for measuring and processing data, eliminating the need to learn multiple software programs and allowing data from many instruments to be analyzed and displayed together on the same platform.

Spectra Manager™ Software Suite

Spectra Manager Ver. 2.5 includes a navigation function that allows those users who may be unfamiliar with IR analysis to perform measurements in exactly the same way as an expert. The parameters set using the navigation function allows the measurement to be started from a pre-defined method.

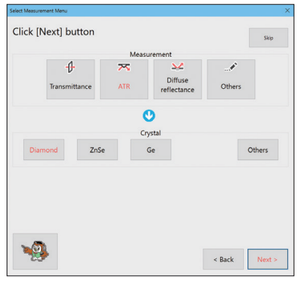
Navigation

Parameters suitable for the measurement are selected from the menu.

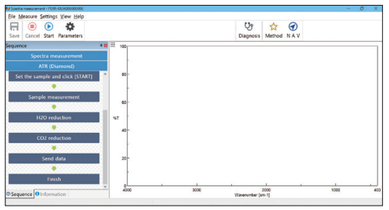


Fit the ATR and start the navigation

Select Spectra Measurement



Confirmation of measurement accessory

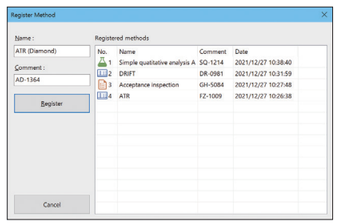


Measurement screen

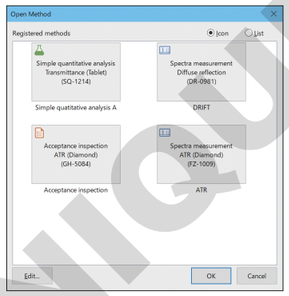
Setting complete

Method function

Define frequently used measurement parameters into methods, perform the measurement by just selecting the method from an icon.



Registering method

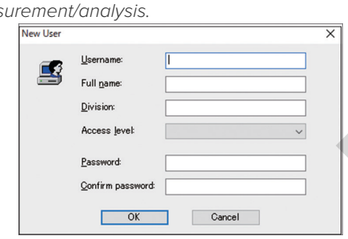


Selecting method

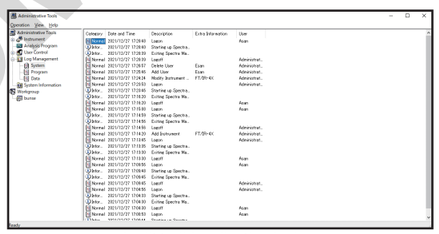
Regulatory Compliance

Developed using the latest requirements of ALCOA +, a requirement for data integrity, Spectra Manager 2.5 CFR is available to support the requirements of electronic signature with 21 CFR part 11 compliance.

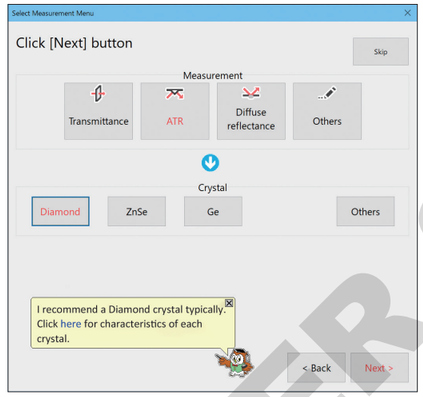
**Note: The Spectra Manager 2.5 CFR may differ from Spectra Manager 2.5 in terms of the contents and operations of measurement/analysis.*



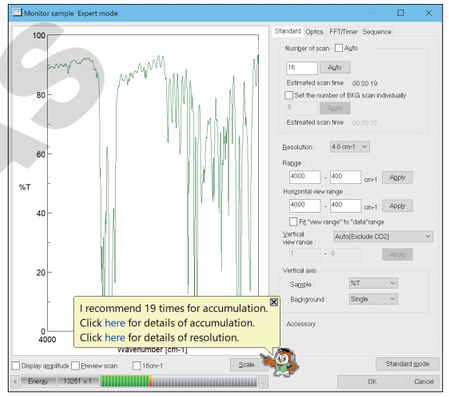
User management (user registration)



Audit trail (application log)



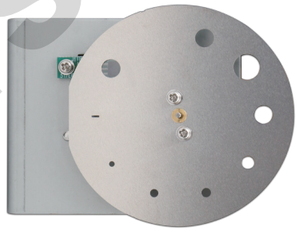
Advice on navigation



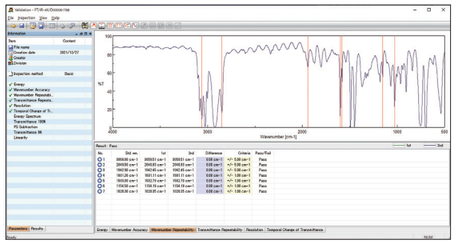
Advice on parameter setting

Auto validation

Auto validation The NIST traceable polystyrene standard reference material for validation is installed inside the interferometer, and can be used to monitor performance Using the Daily Check validation program The polystyrene standard can be recalibrated periodically without removal from the system.



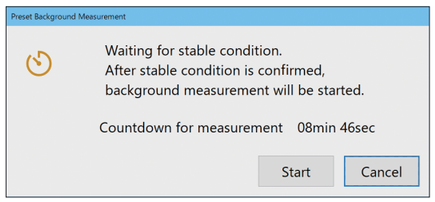
Automatic validation wheel



Validation result

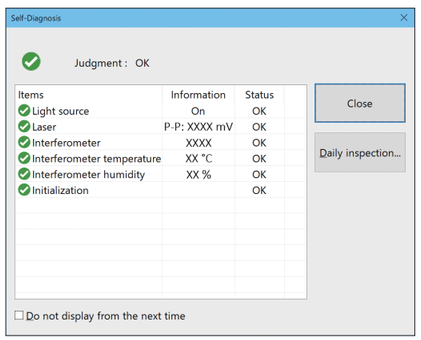
Preset background measurement

Background measurement can be made automatically after the instrument has stabilized. In addition, stable data can be ensured by setting background re-measurement at selected intervals.



Self-diagnosis

The self-diagnosis is made when the instrument in powered on. Any issues will be detected immediately. The results of each power-on self-diagnosis is recorded automatically, and the history can be used to track changes over time.

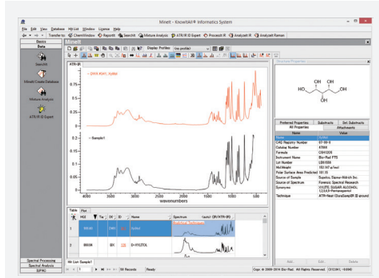


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KnowItAll® JASCO Edition Spectral Search

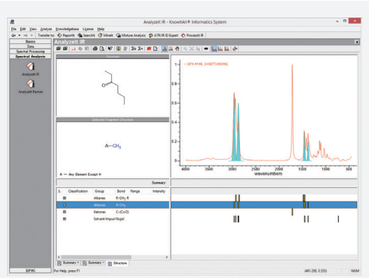
Wiley KnowItAll® Informatics System, JASCO Edition is included* with the FT/IR-4 series instruments. This comprehensive data search database and analysis software includes the following features:

- Free access (for 90 days after software activation) to the database libraries, including 264,000 IR spectra (HaveItAll®), and life time unrestricted access to the data library including 12,600 spectra of general chemical and polymers.
- Search JASCO's own data library including 400 spectra of organic and inorganic compounds.



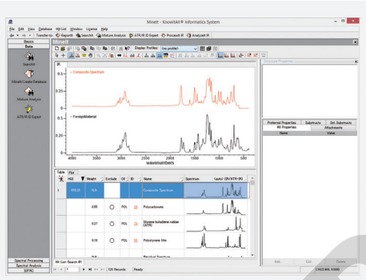
SearchIt™

Search against reference databases as well as your own imported spectra. Searches are customizable and driven by powerful algorithms. Searchable fields include name, structure, substructure, properties, and analytical data, such as spectra and peaks.



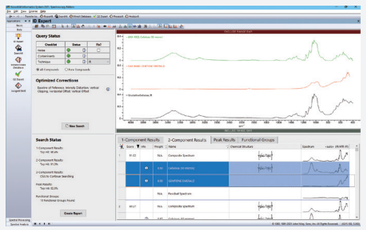
AnalyzeIt™

Interpret the bands in an infrared spectrum. Simply load a spectrum and click on a peak of interest to generate a list of possible functional groups at that position. AnalyzeIt features over 200 functional groups and hundreds of interpretation frequencies.



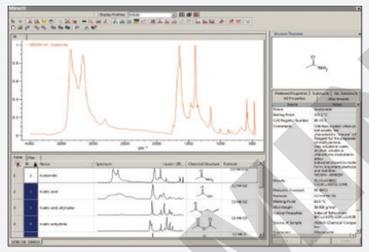
Mixture Analysis

Determine the components in a mixture. Just transfer the spectrum to be analyzed, the software searches and compares the samples to reference databases of known compounds and predicts the possible mixture of components.



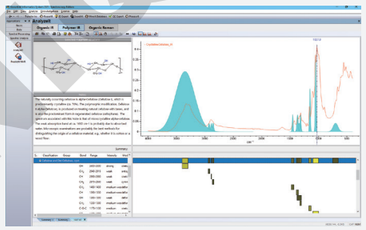
ID Expert™

ID Expert automatically performs a series of basic analyses, single and multi-component search, peak search, and functional group analysis.



MineIt™

Searchable databases can be built for IR and NIR, chemical structures and other metadata. Databases can be customized for users needs. Convenient for QC labs.



AnalyzeIt™ Polymer IR

Useful in the identification of IR spectra of unknown polymers, classification/pattern characterization of polymers.

*Except LE versions

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The KnowItAll® spectral database of 264,000 sample spectra is segmented into 120 easy to search individual libraries.

Polymers & Related Compounds: total 52,055 spectra
ATR-IR - Polymers
IR - Adhesives, plasticizers, polymers etc.

Pure Organic Compounds: total 166,545 spectra
ATR-IR - Standards
IR - Standards
IR - Alcohols, aldehydes, carboxylic acids, hydrocarbons, intermediates, vapors etc.

Industrial Compounds: total 21,975 spectra
IR - Fats, Waxes & Derivatives
IR - Lubricants, additives, solvents and petroleum products
IR - Surfactants

Forensic Sciences: total 21,635 spectra
ATR-IR - Controlled & Prescription Drugs, Pharmaceuticals, Nutraceuticals
ATR-IR - Steroids and hormones
IR - Biochemicals, Abused drugs, dyes, explosives, fibers, flavors
IR - Canadian Forensics, Georgia State Crime lab

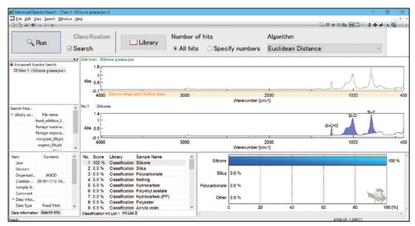
Environmental Application: total 6,350 spectra
IR - HAZMAT
IR - Pesticides, agrochemicals,

Inorganics and Organometallics: total 2,560 spectra
ATR-IR - Inorganics, organometallics
IR - Inorganics, organometallics, minerals and clays

NIR: total 3,800 spectra
NIR - Common Organic Compounds

ADSS-4000 Advanced Spectra Search program

The advanced spectral search program makes it possible for anyone to perform spectral analysis like an experienced operator. Using machine learning to perform classification without reference to a database, it can classify the spectrum of unknown samples into 35 different chemical categories. It can also simultaneously identify the compound by searching against a user editable library (Starting with approx. 600 spectra).



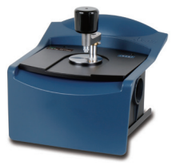
Carboxylic acids	Silicone	Urethanes
Carboxylic acid salts	Epoxy resins	Silica
Carboxylic acid esters	Polyethers	Silica (talc)
Carboxylic acid esters (oil)	Polyethers (polyacetal)	Silica (kaolin)
Proteins	Fluorides	Carbonates
Polyamides	Styrene	Sulfates
Cellulose and sugar	Polycarbonates	Polyimides
Hydrocarbons	Nitriles	Phosphates
Hydrocarbons (polyethylenes)	Phenolic resins	Water
Hydrocarbons (polypropylenes)	Polyvinyl acetates	Acetone
Acrylic resins	Polyvinyl chlorides	Alcohol
Polyesters	Polyvinyl alcohol	

FTIR Sampling Accessories

FTIR Sampling Accessories Attenuated Total Reflectance Measurement

The FT/IR-4X series includes a comprehensive range of ATR accessories for sample measurement. The ATR Pro 4X and ATR Pro 4X View are the 'signature' single reflection monolithic diamond models with wide spectral range and high optical throughput. Versatile models include: wide range sample temperature control, polarization and environmental control.

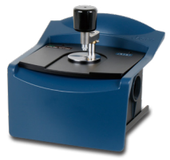
ATR PRO 4X
Single-Reflection ATR



Specifications

ATR prism:	Diamond (High-throughput type, Wide-band type). ZnSe, Ge.
ATR/sample contact area:	2.5 mm diameter (ZnSe, Ge) 1.8 mm diameter (Diamond)
No. of reflections:	1
Angle of incidence:	45°
Pressure:	400 kg/cm^2 (ZnSe, Ge) 700 kg/cm^2 (Diamond)

ATR PRO 4X VIEW
Single-Reflection ATR with Camera



Specifications

ATR prism:	Diamond (High-throughput type and Wide-band type). ZnSe, Ge (without image)
ATR/sample contact area:	2.5 mm diameter (ZnSe, Ge) 1.8 mm diameter (Diamond)
No. of reflections:	1
Angle of incidence:	45°
Pressure:	400 kg/cm^2 (ZnSe, Ge) 700 kg/cm^2 (Diamond)
Software:	Real-time image and recording in data file with Spectra Manager II

ATR PRO470-H
High-Pressure Single-Reflection ATR



Specifications

ATR prism:	Diamond
ATR/sample contact area:	2.0 mm diameter (Diamond)
No. of reflections:	1
Angle of incidence:	45°
Pressure:	1,700 kg/cm^2 (Diamond)

ATR PRO410-M
Multi-Reflection ATR



Specifications

ATR prism:	ZnSe, Ge
ATR/sample contact area:	5 x 20 mm
No. of reflections:	5
Angle of incidence:	45°

ATR PRO550S-S, ATR PRO570S-H
Sample-Shielding Single-Reflection ATR



Specifications

ATR prism:	ZnSe, Ge, Diamond (550S-S) Diamond (570S-H)
ATR/sample contact area:	1.5 mm diameter (ZnSe, Ge) 2.0 mm diameter (Diamond)
No. of reflections:	1
Angle of incidence:	45°
Pressure:	400 kg/cm^2 (550S-S) 1,700 kg/cm^2 (570S-H)

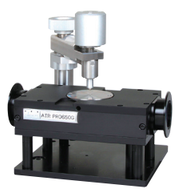
ATR PRO610P-S, ATR PRO630P-H
Polarizer Single-Reflection ATR



Specifications

ATR prism:	ZnSe, Ge, Diamond (610P-S) Diamond (630P-H)
ATR/sample contact area:	1.5 mm diameter (ZnSe, Ge) 2.0 mm diameter (Diamond)
No. of reflections:	1
Angle of incidence:	45°
Pressure:	400 kg/cm^2 (610P-S) 1,700 kg/cm^2 (630P-H)
Polarizer/analyzer:	Wire-grid polarizer (KRS-5)
Polarizer rotation angle:	0 - 360°

ATR PRO650G
65° Incident-Type Single-Reflection ATR



Specifications

ATR prism:	Ge
ATR/sample contact area:	3.0 mm diameter
No. of reflections:	1
Angle of incidence:	65°
Maximum sample size:	6 inches

* A polarizer and attenuator mesh are optional

ATR PRO670H-S, ATR PRO690H-H
Temperature Controlled Single-Reflection ATR



Specifications

ATR prism:	ZnSe, Ge, Diamond (670H-S) Diamond (690H-H)
ATR/sample contact area:	1.5 mm diameter (ZnSe, Ge) 2.0 mm diameter (Diamond)
No. of reflections:	1
Angle of incidence:	45°
Pressure:	400 kg/cm^2 (670H-S) 1,700 kg/cm^2 (690H-H)
Operating temperature:	180°C (Diamond) 150°C (Ge) 120°C (ZnSe)

* A connector panel is required when this accessory is fitted to the FT/IR-6000FV.

ATR PRO ONE T
Large Sample Single-Reflection ATR



Specifications

ATR prism:	ZnSe, Ge, diamond (High-throughput type, Wide-band type)
ATR/sample contact area:	2.5 mm diameter (ZnSe, Ge) 1.8 mm diameter (Diamond)
No. of reflections:	1
Angle of incidence:	45°
Pressure:	400 kg/cm^2 (ZnSe, Ge) 700 kg/cm^2 (Diamond)

Grazing-Angle Reflectance Measurement

Reflection Absorption Spectroscopy has the benefit of greater sensitivity - up to 1 or 2 orders of magnitude compared with transmission. When parallel polarized light is incident to a metal surface, the electric vectors in the incident and reflected light interfere to mutually strengthen and form a vertical standing wave. The interaction of this stationary wave with a thin film on the metal surface, causes an absorption that is stronger than simple transmission measurement.

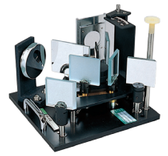
RAS PRO410-H
85° Incident Angle without Mirror



Specifications

Optical system:	Refractive optics
Angle of incidence:	85°
Polarizer/analyzer:	Wire-grid polarizer (KRS-5)
Polarizing direction:	Fixed at 0° to the plane of incidence
Sample placement:	Horizontal
Sample mask:	20 x 10 mm, 10 x 10 mm (Option: 10 x 5 mm)
IQ accessory:	Available
Smart purge:	Available

PR-510i
Variable Incident Angle



Specifications

Angle of incidence:	55 - 85°
Polarizer/analyzer:	Wire-grid polarizer (KRS-5)
Sample placement:	Vertical
Sample size:	30 x 40 mm
IQ accessory:	Available

RAS PRO410-B
80° Incident Angle



Specifications

Angle of incidence:	80°
Polarizer:	PL-82 is required
Sample placement:	Horizontal
Sample mask:	20 x 10 mm, 10 x 10 mm
IQ accessory:	Available
Smart purge:	Available

RAS-300/Hi
75° Incident Angle



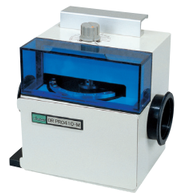
Specifications

Angle of incidence:	75°
Polarizer:	Polarizing mirror (parallel polarization only)
Sample placement:	Horizontal
Sample mask:	20 x 10 mm, 10 x 10 mm
IQ accessory:	Available

Diffuse and Specular Reflectance Measurement

Diffuse reflectance is a useful technique for samples with a roughened surface which are not amenable to transmission or ATR measurement, such as some powders, pharmaceuticals, plastics and food products etc. The diverse range of diffuse reflectance products includes heated, vacuum and automatic sampling accessories.

DR PRO410-M
Multi-Sample Diffuse Reflectance



Specifications

Sampling:	7-position sample holder x 2
IQ accessory:	Available
Smart purge:	Available

* Automatic sample switching is optional

SMART-400i
Smart Tech Multi-Sample Diffuse Reflectance



Specifications

Sampling:	7-position sample holder x 2
IQ accessory:	Available
Smart purge:	Available

* Automatic sample switching is optional

DR-650Ai Bi, Ci
Vacuum/Heated Diffuse Reflectance

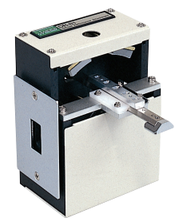


Specifications

Cell temperature:	1000°C (Ai), 800°C (Bi), 600°C (Ci)
Vacuum level:	0.13 Pa
Sample size:	6 mm in diameter
Window material:	KBr
Gas flow:	Available
Heater:	Kanthal heater
Cell cooling method:	Water-cooled
IQ accessory:	Available

* Temperature controller and related software are optional

DR-81
Diffuse Reflectance



Specifications

Sampling:	5-position sample holder

NRF PRO410-N
Near IR Diffuse Reflectance



Specifications

Wavenumber range:	15,000 - 4,000 cm^{-1}
Angle of incidence:	11.2°
Spot size:	10 mm in diameter
Reference material:	Diffusion plate for reference
IQ accessory:	Available
Option:	Test tube holder Pellet holder Powder sample holder

RF-81S
Specular Reflectance



Specifications

Angle of incidence:	10°
No. of reflections:	1
Sample mask:	1, 3 and 5 mm in diameter

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Related Instruments

IRT-7200

The IRT -5200 is a simple to use and hghly productive accessory f or hte FT/IR-4X, using a single MCT detector with options for near and far IR. automatic stage, IQ Mapping and IQ Frame make this the most versatile IR microscope JASCO has ever developed. The ClearView range of view through ATRs with pressure stage with repeatable contact make ATR mapping easy for users at every level.



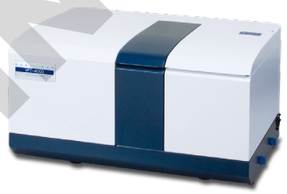
IRT-7200

Imaging measurement is essential for analyzing/visualizing the chemical structure of samples. Conventional IR microscopes with single-element detector are most commonly used, but with the disadvantage that the measurement time can be quite long. Using a 16 element MCT detector with high-speed automatic XYZ stage,the IRT-7200 can perform high-speed mapping measurement, up to a hundred times faster than a single-element detector.



VFT-4000

The VFT-4000 is a VCD attachment for the FTIR spectrometers, for measuring vibrational circular dichroism in the infrared region. The VFT-4000 can be used to obtain information about optical activity and absolute stereochemistry. Since the CD signal sare extemely small, stability and sensitivity are essential. The VFT-4000 offers highly stable and sensitive measurement using lock-in detection using a DSP (digital signal processor) with sophisticated algorithm optimized for VCD as well as thermal control of the optical system.



Specifications

Hardware		
Measurement Wavenumber Range	7,800 - 350 cm^{-1}	
Measurement Wavenumber Extended Range *1(optional)	11500 to 375 cm^{-1} (NMIR-4X) 6000 to 220 cm^{-1} (MFIR-4X-N) 6000 to 50 cm^{-1} (MFIR-4X-W)	
Resolution	0.4, 0.5, 1.0, 2, 4, 8, 16 cm^{-1}	
Signal-to-Noise Ratio *2	35,000:1	
Detector	Standard	DLATGS (with Peltier temperature control)
	Optional	MCT-N, MCT-M, MCT-W, MCT-PV, InGaAs, Broad band DLATGS *3, PAS (PC switching, User exchangeable)
Beam Splitter	Standard	Ge/KBr
	Optional	Broad band KBr, Mid-far IR broad band (not interchangeable)
Light Source	Standard	High-intensity ceramic source
	Optional	Halogen lamp (PC switching)
Interferometer	45° Michelson interferometer with corner-cube mirror, sealed structure (KRS-5 window), auto-alignment mechanism, DSP control	
Purging (standard)	Standard	Sample/detector compartment
	Optional	Interferometer
A/D Converter	24-bit A/D converter	
Drive Method	Mechanical bearing, electromagnetic drive	
Drive Speed	1, 2, 3, 4 mm/sec Rapid scan: 32, 64 mm/sec.	
Rapid Scan *4 (optional)	80 spectra/sec. (16 cm^{-1} resolution)	
Communication	USB 2.0	
Vibration-Proof	Vibration-proof design mounting	
iQX Accessory	Standard	
Start Button	Standard	
Dimensions and Weight	386 (W) × 479 (D) × 254 (H) mm, 18 kg	
Required Power	AC 100 to 240 V, 50/60 Hz, maximum 50 VA	
Operation Environment	Temperature: 17 to 27 °C / humidity: less than 70 %	
Data Processing		
Software	JASCO Spectra Manager Ver.2.5 *5	
Operating System	Windows 10 Pro (64-bit)	

*1 One of three options (near-mid IR region, mid-far IR region) should be selected when extending the measurement wavenumber range.
*2 Measurement condition: 4 cm-1 resolution, 1 minute accumulation, near 2200 cm-1, P-P
*3 Broad band DLATGS is installed instead of DLATGS as standard detector when selecting the far IR extension option.
*4 Performance of rapid scan function was evaluated when installing Ge/KBr beam splitter. MCT detector is also required.
*5 JASCO can provide Spectra Manager Ver.2.5 CFR which is compliant with FDA 21 CFR PART 11. * Installation area for PC and printer

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CE

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