VeeMAX III

AT A GLANCE

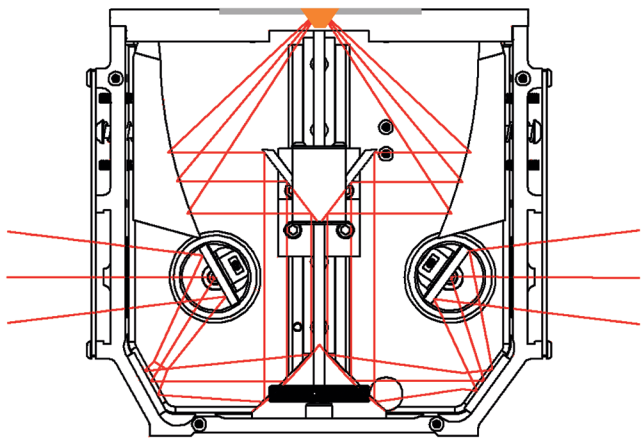
- 0.4 to 46-micron depth of penetration
- High throughput for excellent quality spectra
- Integrated position for manual or automated polarizer
- Can be used as a variable angle of incidence specular reflection accessory
- Configurable for monolayer studies and spectroelectrochemistry
- Sealed and purgeable optical design to eliminate water vapor and carbon dioxide interferences

AUTOMATION OPTION
TEMPERATURE CONTROL



The VeeMAX III with ATR offers continuous variable angle of incidence and a variety of crystal plates to selectively control the depth of penetration of the IR beam into the sample. ATR applications include the study of layered samples, coatings, release agents, monolayers on silicon and spectroelectrochemistry.

The VeeMAX III with ATR accessory provides exceptionally high throughput (over 50% with 45 degree ZnSe crystal) to minimize sampling time and enable detection of low concentration components in samples of complex composition. The crystal flat plates offered for the VeeMAX are ideal for solid and layered samples and are designed for use with the optional pressure clamp. The combination of large crystal diameter (20 mm) and slip-clutch pressure clamp provides sample-to-crystal contact without altering layered sample composition. The optional liquids retainer may be added to the crystal plate.



VeeMAX III with ATR optical layout.

TEMPERATURE CONTROL

Temperature controlled crystal flat plates are available for thermal studies. The maximum temperature is 130 °C for all crystal types. PIKE Technologies' temperature controller allows unlimited ramps to be easily programmed using PIKE TempPRO software. Data collection as a function of time or temperature may be prescribed for most FTIR spectrometers.



Heated crystal plate.

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AUTOMATED VEEMAX

Motorized control of angle of incidence via personal computer is available for the accessory. The Automated VeeMAX III is ideal for depth of profiling studies as it greatly speeds and improves the precision and reproducibility of the data collection process. AutoPRO software interfaces with most FTIR software packages for automated data collection.

MONOLAYERS APPLICATIONS

Monolayers and ultra-thin films absorbed on silicon or gold substrate are easily sampled using the VeeMAX when equipped with a high refractive index ATR crystal. Compared to specular reflection sampling for monolayer analysis, an increase in sensitivity of up to 1–2 orders of magnitude may be realized via ATR sampling. For these applications, the VeeMAX III accessory is configured to include a high-angle Ge flat plate (60 or 65 degrees), the high-pressure clamp with a 7.8-mm pressure tip, and a polarizer.

SPECTROELECTROCHEMICAL CELLS

The Jackfish Electrochemical Cells (SEC) are fully compatible with the VeeMAX, and offer a complete solution for spectroelectrochemical experiments via ATR-SEIRAS technique. The Jackfish cells, designed for organic and aqueous environments, may be configured for use with VeeMAX ATR face-angled crystals, or micromachined silicon ATR wafers.



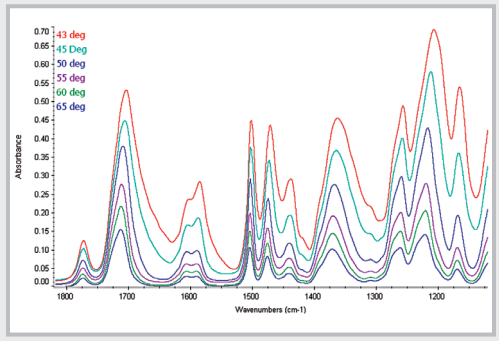
The Jackfish J2 spectrolectrochemical cell.

In addition to the Jackfish SEC, PIKE offers a customizable electrochemical cell for the VeeMAX. The PIKE electrochemistry cell is equipped with a precision micrometer for electrode positioning, and is ideal for external reflection experiments.

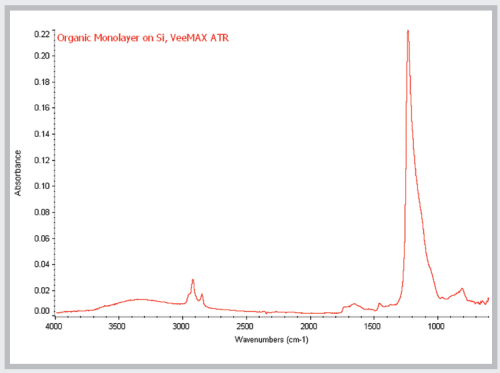


PIKE spectroelectrochemical cell.

APPLICATION



Depth profiling spectra of layered polymer film, collected using ZnSe crystal at angles of incidence from 43 to 65 degrees. IR absorbance band at 1591 cm^{-1} clearly increases relative to other bands as we probe deeper into the sample.



Monomolecular layer on silicon spectrum, collected with VeeMAX III with 60 degree Ge crystal, pressure clamp with 7.8-mm tip and p-polarization.



Automated VeeMAX III with polarizer option for automated depth profiling studies. Angle of incidence and polarization angle can be set independently.

SPECIFICATIONS

ATR Crystal Choice	ZnSe, Ge, Si, ZnS
Crystal Plate Mounting	User-changeable plates
Crystal Plate Housing	Stainless Steel
Crystal Dimension (surface)	20-mm diameter
Optics	All reflective
Pressure Device	Rotating, continuous variable pressure; click stop at maximum
Heating Options	130 °C
Accuracy	+/- 0.5° up to 100 °C +/- 0.5% of set point > 100 °C
Sensor Type	3 wire Pt RTD (low drift, high stability)
Temperature Control	Touch-panel display with USB interface. PIKE TempPRO software for PC control with unlimited ramps and automated data collection.
Input	100–240 VAC, auto setting, external power supply
Output	24 VDC/50 W maximum
Purge Sealing	Purge tubes and purge barb included
Accessory Dimensions (W X D X H)	177 x 92 x 162 mm (excludes clamp height and baseplate)
Jackfish Spectroelectrochemical	
J1 Vessel Volume	20 mL
J2 Vessel Volume	10 mL
Jackfish Spectroelectrochemical Vessel Material	Polytetrafluoroethylene or PEEK
Spectroelectrochemical	
Vessel Volume	7.5 mL
Vessel Dimensions	25 mm tall, 25 mm dia tapering to 19 mm
Spectroelectrochemical Vessel Material	Polytetrafluoroethylene or PEEK
FTIR Compatibility	Most, specify model and type

PART NUMBER	DESCRIPTION
013-11XX	VeeMAX III Variable Angle Specular Reflectance Accessory Includes specular reflectance masks (2, ⅝ and ⅜"), gold substrate alignment mirror, purge tubes, purge kit and spectrometer base mount.
013-12XX	Automated VeeMAX III Includes controller, cabling, sample masks (2", ⅝" and ⅜"), gold substrate alignment mirror, FTIR base mount, and purge tubes
	Note: Replace XX with your spectrometer's Instrument Code listed in the back of the catalog. Automated VeeMAX III includes PIKE Technologies AutoPRO software and controller.
	Crystal Plates for VeeMAX III ATR *(must select 1 or more for ATR)*
013-4021	Flat Plate, ZnSe, 45°
013-4031	Flat Plate, ZnSe, 60°
013-4041	Flat Plate, Ge, 45°
013-4051	Flat Plate, Ge, 60°
013-4061	Flat Plate, Ge, 65°
013-4081	Flat Plate, Si, 45°
013-4071	Flat Plate, Si, 60°
013-4091	Flat Plate, ZnS, 45°
013-4096	Flat Plate, ZnS, 60°
013-3401	Liquids Retainer for VeeMAX III ATR crystals
013-3501	VeeMAX III ATR Flow Cell
	Notes: VeeMAX III Crystal Plates are pre-aligned and pinned-in-place. Changing crystal plates is easy and fast to optimize sampling results. ZnS crystal plate is excellent for deepest penetration of IR beam. If you need a crystal not listed here, please contact us. Flow cell and Liquids Retainer require High-Pressure Clamp. Reconditioning service for used VeeMAX crystal plates is available. Optional Crystal Plates for Heated VeeMAX III ATR.
	Pressure Clamp for VeeMAX III *(must select for solids, films or powder analysis)*
013-3101	VeeMAX III ATR Pressure Clamp
025-3094	7.8-mm ATR Pressure Tip

PART NUMBER	DESCRIPTION
	Notes: The pressure clamp is required for solids, films, coatings and powdered samples. The pressure clamp is supplied with 20-mm tip for solid samples. The 7.8-mm pressure tip is required for monolayers on silicon or small samples.
	Heated Plates
013-4121	Heated Flat Plate, ZnSe, 45°
013-4131	Heated Flat Plate, ZnSe, 60°
013-4141	Heated Flat Plate, Ge, 45°
013-4151	Heated Flat Plate, Ge, 60°
013-4161	Heated Flat Plate, Ge, 65°
013-4171	Heated Flat Plate, Si, 60°
013-4181	Heated Flat Plate, Si, 45°
013-4191	Heated Flat Plate, ZnS, 45°
013-4196	Heated Flat Plate, ZnS, 60°
076-1610	Digital Temperature Control Module
007-0207	PIKE TempPRO Software
	Notes: Heated VeeMAX III crystal plates may be heated to 130 °C. Temperature control module selection is required for heated crystal plates. If PC control is desired TempPRO software must be purchased separately.
	VeeMAX III Sampling Options
090-1000	Manual Polarizer, ZnSe
090-1200	Manual Polarizer, KRS-5
090-3000	Precision Manual Polarizer, ZnSe
090-3200	Precision Manual Polarizer, KRS-5
090-5000	Precision Automated Polarizer, ZnSe, USB
090-5100	Precision Automated Polarizer, KRS-5, USB
007-0300	PIKECalc Software
	Notes: PIKECalc software provides easy calculations of depth of penetration, effective angle of incidence and critical angle for ATR measurements. Other polarizer options are found in the polarization section of this catalog. Automated VeeMAX III and automated polarizer interface simultaneously.

PART NUMBER	DESCRIPTION
	Replacement Parts
013-4010	Mask Set for VeeMAX
300-0002	Gold Substrate Alignment Mirror, 1.25 x 3.0"
	Spectroelectrochemical Configuration
162-4709	Jackfish SEC Cell J1F
162-4714	Jackfish SEC Cell J1W
162-4719	Jackfish SEC Combination Cell J1
162-4701	Jackfish SEC Cell J2F
162-4702	Jackfish SEC Cell J2W
162-4703	Jackfish SEC Combination Cell J2
162-4814	J1W, J2W Universal ATR Si elements (2)
162-4816	J1W, J2W ATR-SEIRAS Optimized Si elements (2)
160-5546	ZnSe Crystal, 45°
160-5550	ZnSe Crystal, 60°
160-5547	Ge Crystal, 45°
160-5551	Ge Crystal, 60°
160-5548	Si Crystal, 45°
160-5552	Si Crystal, 60°
160-5549	ZnS Crystal, 45°
160-5553	ZnS Crystal, 60°
160-5527	CaF_2 Crystal, 60°
160-1144	CaF_2 Flat Window, 20-mm diameter
160-1304	ZnSe Flat Window, 20-mm diameter
013-3300	Electrochemical Cell, PTFE
013-3370	Electrochemical Cell, PEEK
013-3402	Heated Electrochemical Cell, PTFE
013-3320	Flat Window Holder, Delrin™
013-3345	45° Crystal Holder, Delrin
013-3360	60° Crystal Holder, Delrin
013-3374	45° Crystal Holder, PEEK
013-3376	60° Crystal Holder, PEEK
013-3445	Heated 45° Crystal Holder
013-3460	Heated 60° Crystal Holder
	Notes: The Jackfish SEC requires selection of the cell and a ATR crystal; for a full selection of Jackfish options including electrodes, see the Jackfish product datasheet. The PIKE electrochemical configuration requires electrochemical cell, crystal or window holder and VeeMAX III accessory. Must select one or more crystal or flat window. Choose a crystal holder to match the crystal angle. A flat window or CaF_2 crystal are used for specular reflectance sampling. Other window types for specular reflectance measurements may be found in our listing of transmission windows, 20 mm x 2 mm. The heated electrochemical cell requires the selection of a Digital Temperature Control Module. If PC control is desired TempPRO software must be purchased separately. Electrodes for the PIKE electrochemical cell are supplied by the end-user.

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