

IRUBIS



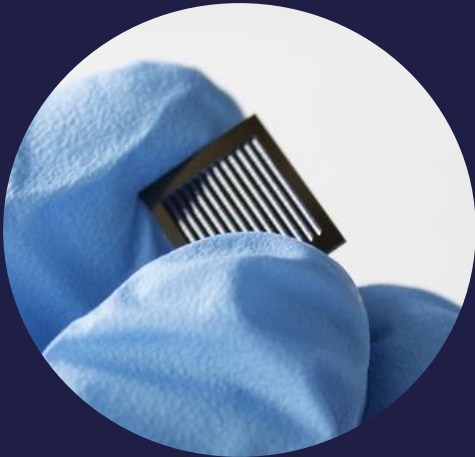
INNOVATING INFRARED SPECTROSCOPY

PRODUCT BROCHURE
ATR CRYSTALS

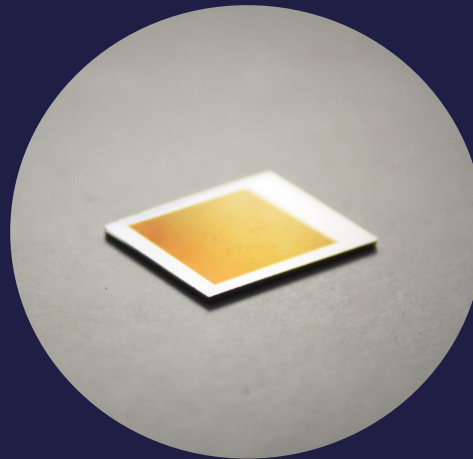


January 2019

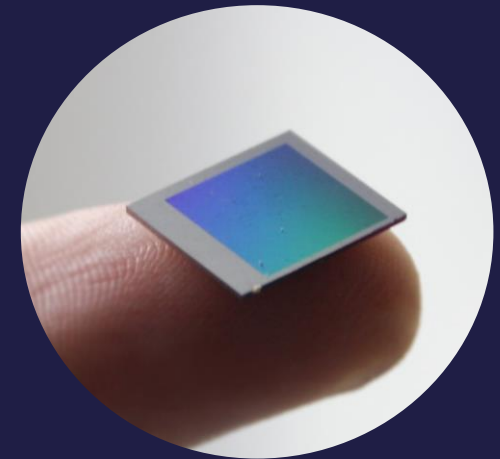
IRUBIS ATR Crystal



Universal
**Basic Single Reflection
ATR Crystal**



Specialized 1
**Low Penetration Depth
ATR Crystal**



Specialized 2
**Signal Enhanced
ATR Crystal**

Planned release: summer 2019

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Technological Innovation



Our Crystals are made of silicon. This does not only drastically lower the price, it is also a very robust material.

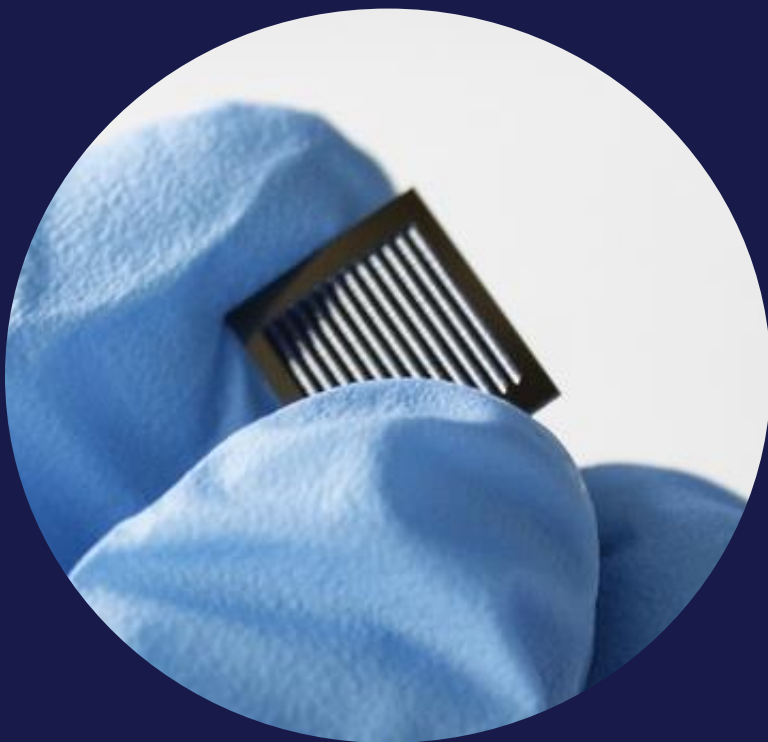
During the manufacturing process, our sample carriers receive a special micromechanical structuring on the underside. In these prisms a single internal reflection occurs. The advantage of a single bounce ATR is that there is no focusing required.

As the ATR crystals are very thin, the light path is as short as 1 mm. It is therefore possible to access the fingerprint region.

Universal ATR Crystal

As Good as Diamond

Universal ATR Crystal • Technological Innovation



Our Universal ATR Crystal has the same performance as a single bounce diamond crystal and a broad spectral range.

Compared to standard ATR FTIR sample carriers, this crystal is

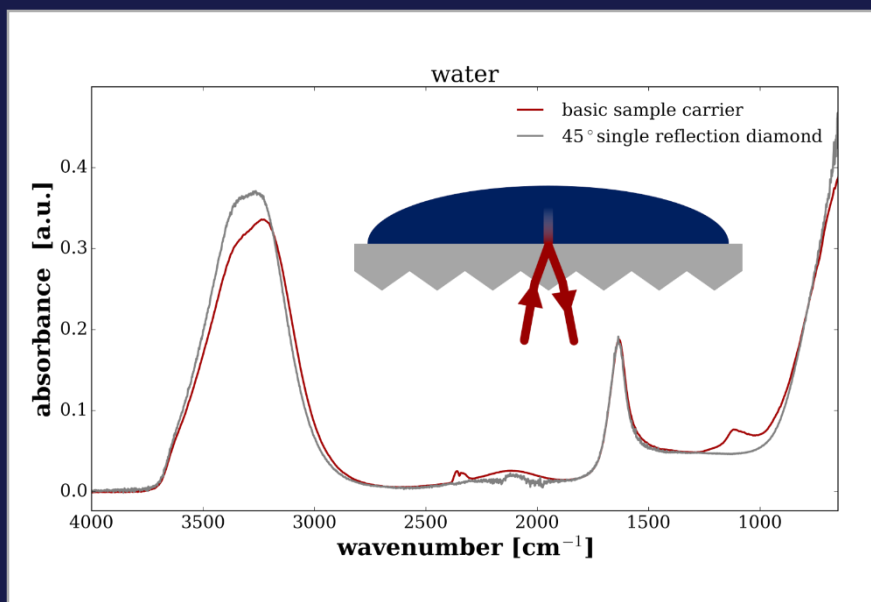
- cost effective
- extremely robust
- functionalizable

Universal ATR Crystal • Technical Details



- Product type: Single-bounce ATR crystal
- Dimensions: 11 mm x 9 mm x 0.5 mm
- Active ATR surface: 9 mm x 7 mm
- Microstructured underside
- pH-range: 1 to 12
- Material: silicon
- Angle of incidence: 0° - 60°
- Recommended AOI: 20°

Universal ATR Crystal • Spectral Characteristics



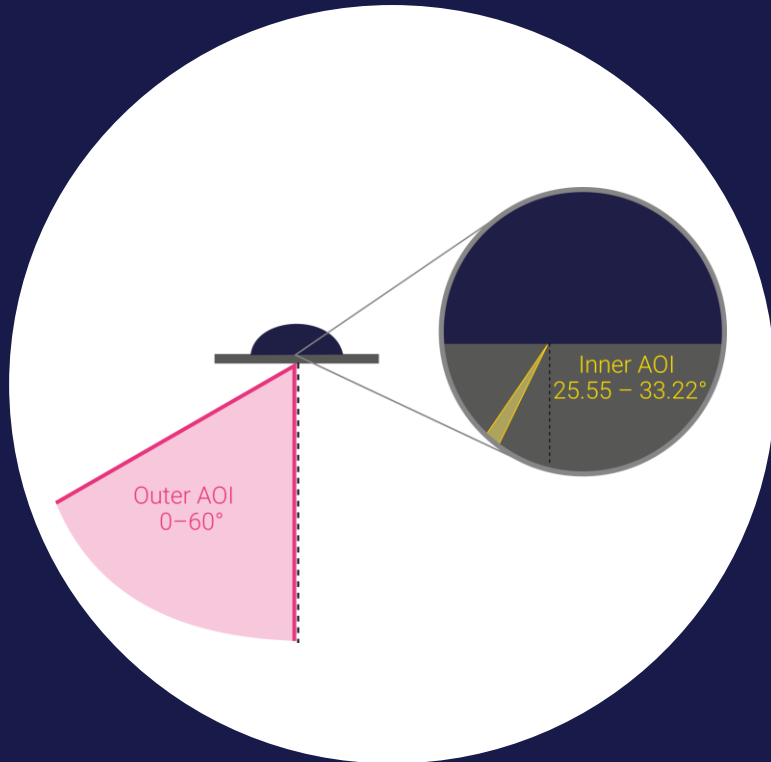
The graph shows the absorption of water on the Universal ATR Crystal compared to a standard single reflection diamond ATR crystal.

The full spectral range including the fingerprint region can be accessed.

The typical cut-off of silicon is avoided by the very thin ATR crystal (0.5 mm).

The penetration depth is comparable to a single bounce diamond ATR at 45°.

Universal ATR Crystal • Angle of Incidence



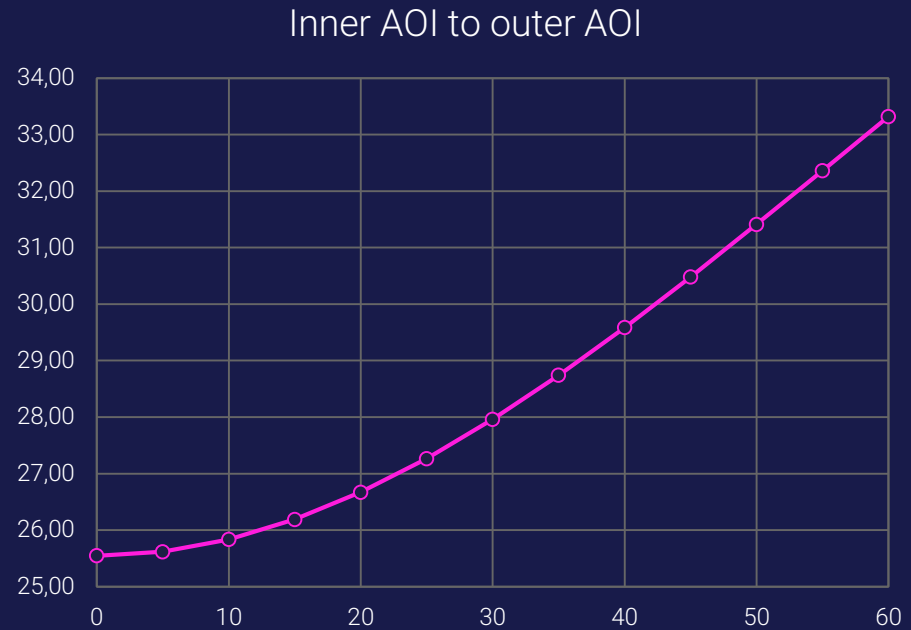
- The AOI can be varied between 0 and 60 degrees.
- 20 degrees is the optimized angle based on the penetration depth.

Additional Information, negligible for standard measurements:

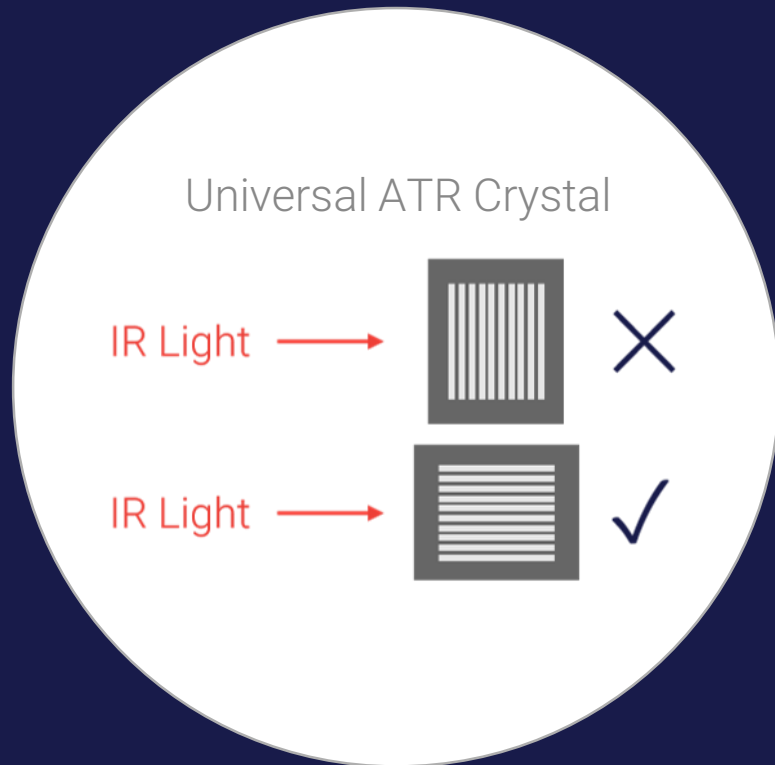
When the infrared beam enters the crystal, the outer AOI gets translated into an inner AOI. You can find a table for calculations on the next page.

Universal ATR Crystal • Angle of Incidence

Outer AOI	Inner AOI
0	25.55
5	25.62
10	25.84
15	26.19
20	26.67
25	27.27
30	27.96
35	28.74
40	29.58
45	30.48
50	31.41
55	32.36
60	33.32



Universal ATR Crystal • Positioning



- Orientation:
To receive ideal results, please insert the crystal so that the beam path is parallel to the longer side of the crystal and the microstructures.
- Recommended angle of incidence:
20 degrees.

Universal ATR Crystal • Compatibility



The crystal can be used with standard ATR accessories. Place the sample carrier on the top of your accessory and focus the beam on the underside of the crystal.

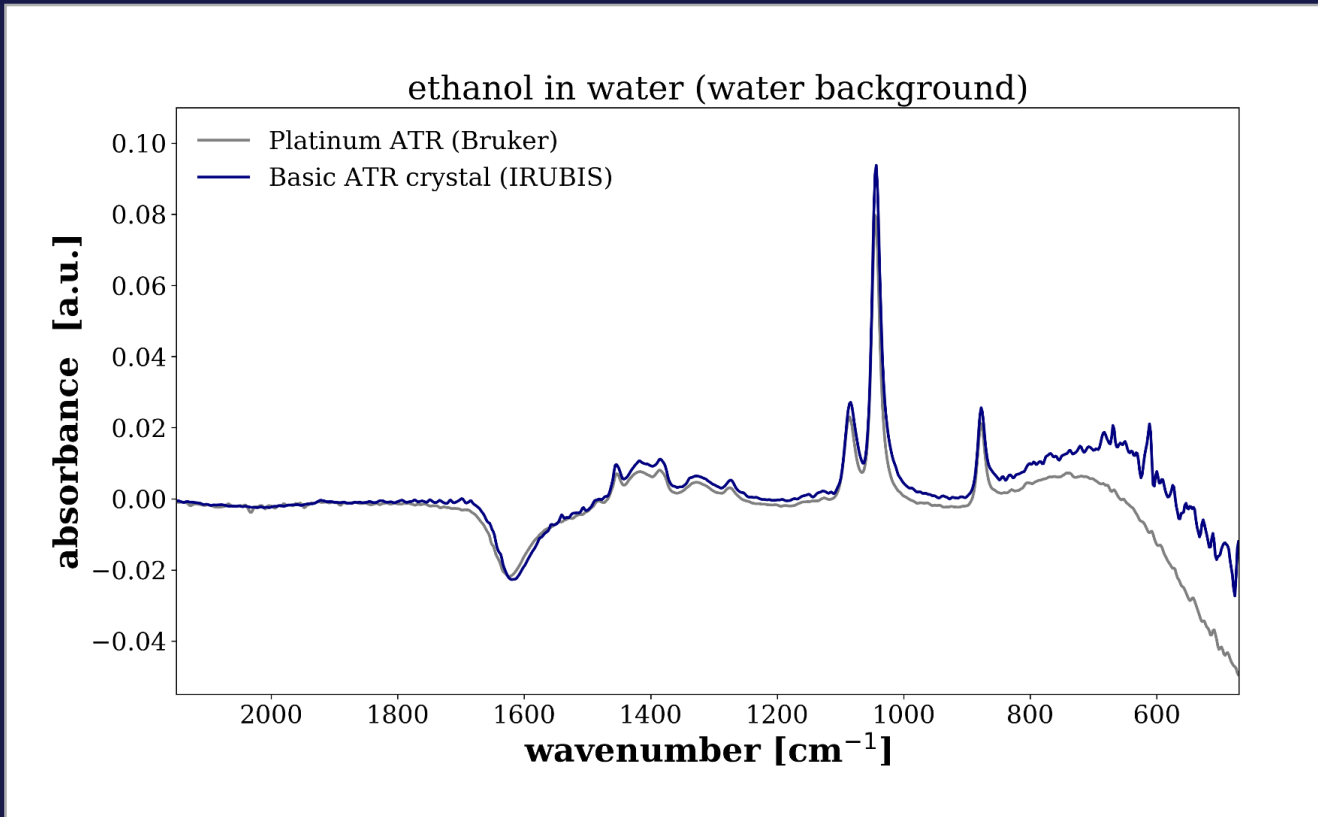
The IRUBIS Obsidian Accessory has an AOI of 20 degrees and is optimized for the Single Reflection ATR Crystal.

Universal ATR Crystal • Cleaning Procedure

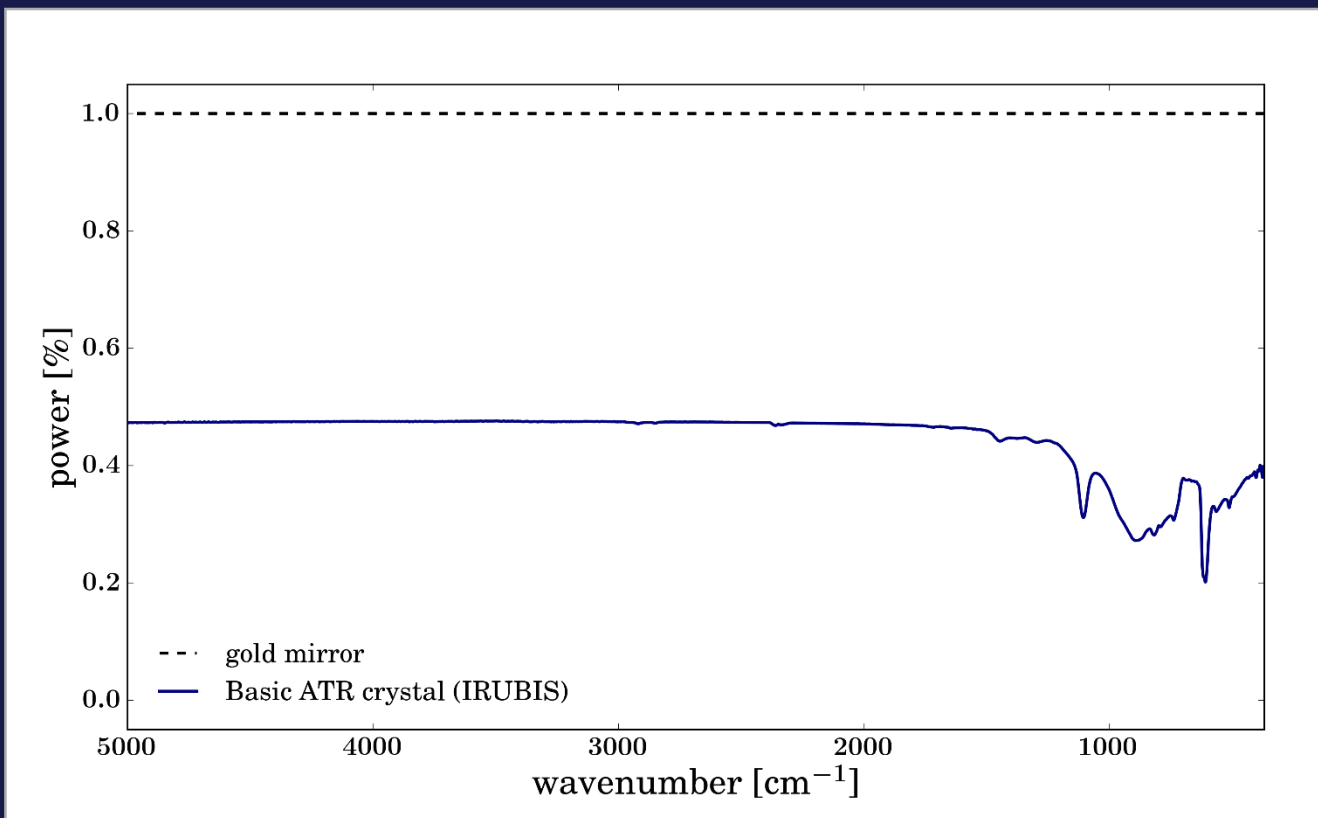
You can use any cleaning agent. The crystal is not pH sensitive.

Please note: The crystals were manufactured under clean room conditions and cleaned with isopropyl alcohol during packaging. Nevertheless, we recommend that you rely on your own cleaning process for critical applications.

Universal ATR Crystal • Sample Spectra



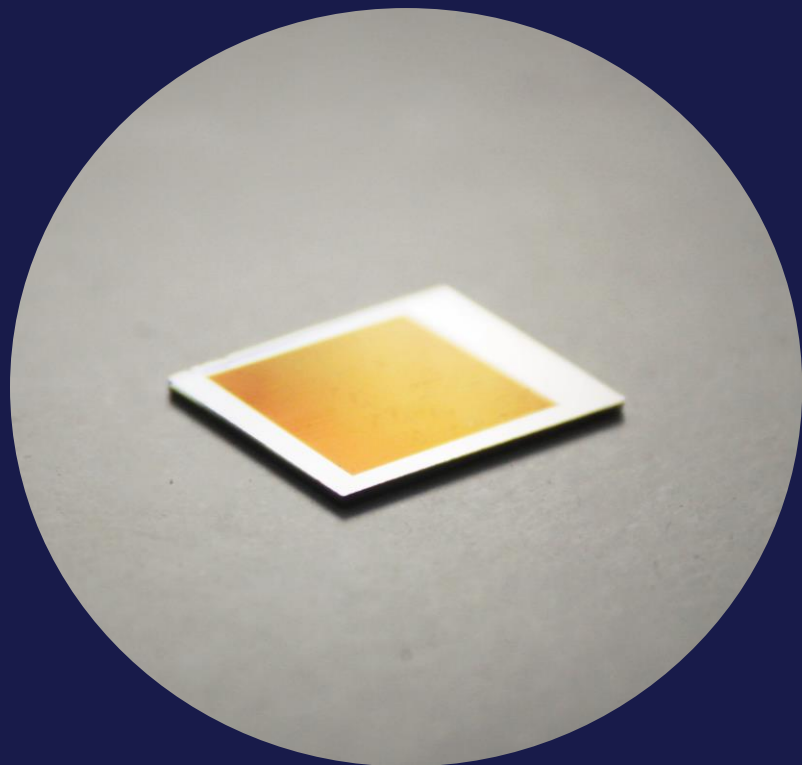
Universal ATR Crystal • Sample Spectra



Specialized 1

Low Penetration Depth ATR Crystal

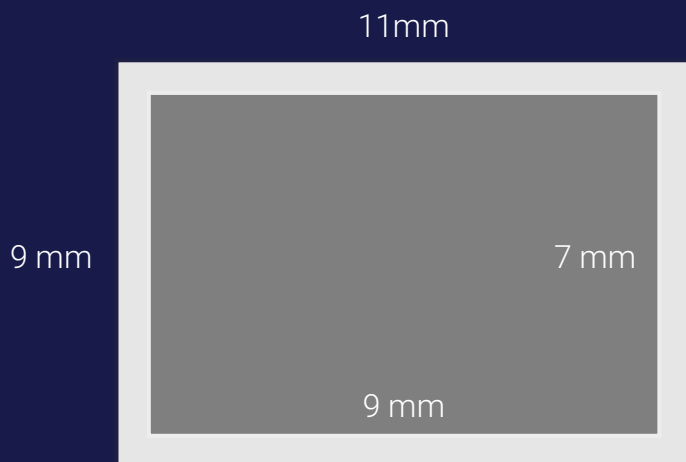
Specialized 1 ATR Crystal • Technological Innovation



This crystal has a high angle of incidence and thus a reduced penetration depth.

This version is suitable for various applications such as Surface Enhanced Infrared Absorption Spectroscopy (SEIRAS).

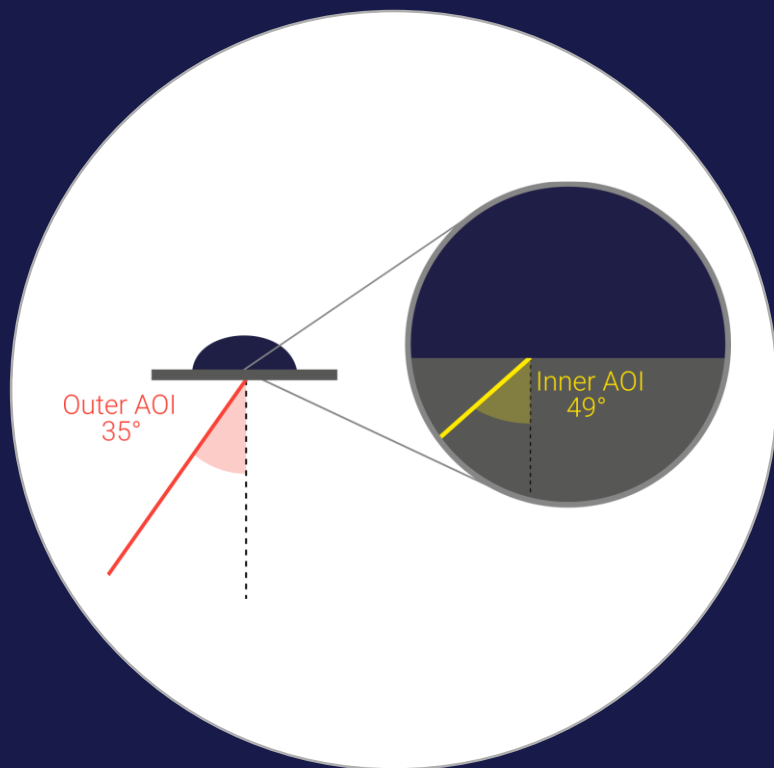
Specialized 1 ATR Crystal • Technical Details



- Product type: Single-bounce ATR crystal
- Dimensions: 11 mm x 9 mm x 0.5 mm
- Active ATR surface: 9 mm x 7 mm
- Microstructured underside
- pH-range: 1 to 12
- Material: silicon

For further information, please see the instructions for our Universal ATR Crystal.

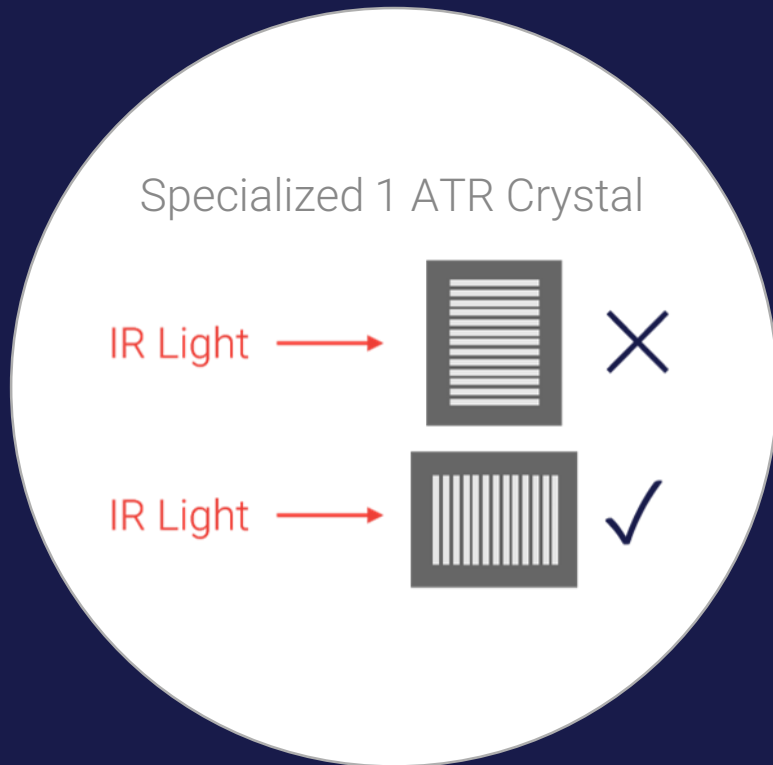
Specialized 1 ATR Crystal • Angle of Incidence



- Recommended outer AOI: 35°
- Corresponding inner AOI: 49°

Please set your accessory to 35° for optimum results.

Specialized 1 ATR Crystal • Positioning

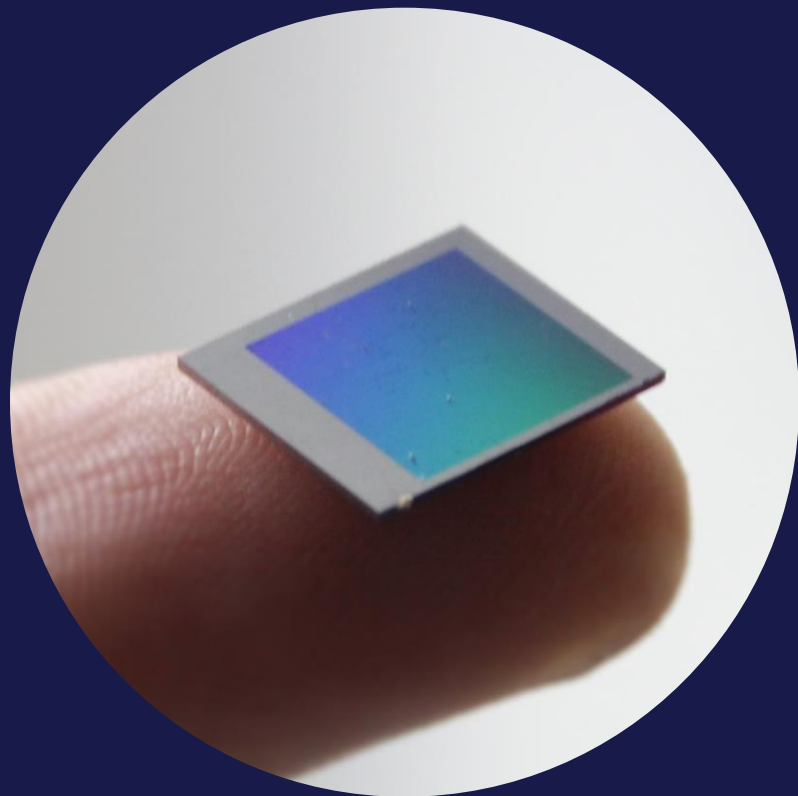


- Orientation:
To receive ideal results, please insert the crystal so that the beam path is parallel to the longer side of the crystal and antiparallel to the microstructures.
- Recommended outer AOI: 35°
- Compatibility:
The crystal can be used with standard ATR accessories. Place the sample carrier on the top of your accessory and focus the beam on the underside of the crystal.

Specialized 2

Signal Enhanced ATR Crystal

Specialized 2 ATR Crystal • Technological Innovation

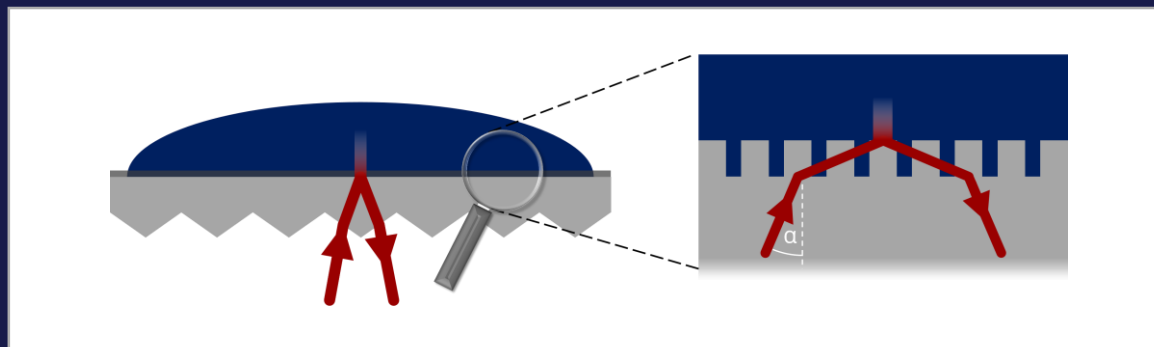


By adding special microstructures to the surface of our Single Reflection ATR Crystal, we are able to achieve a signal enhancement.

The patent-pending microstructures lead to a better signal-to-noise ratio and enhance the IR signal. The result is a higher absorption and thus more distinct peaks.

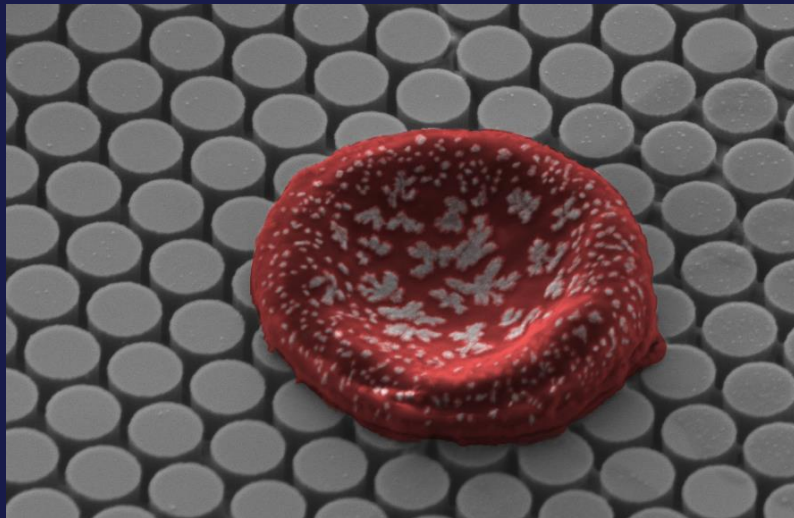
Planned release: summer 2019

Specialized 2 ATR Crystal • Innovative Microstructures



- The liquid sample fills the space between the microstructures on the surface.
- Since the structures are smaller than the wavelength, an effective medium is created.
- As a result, the infrared light interacts more intensively with the sample, resulting in higher absorption.

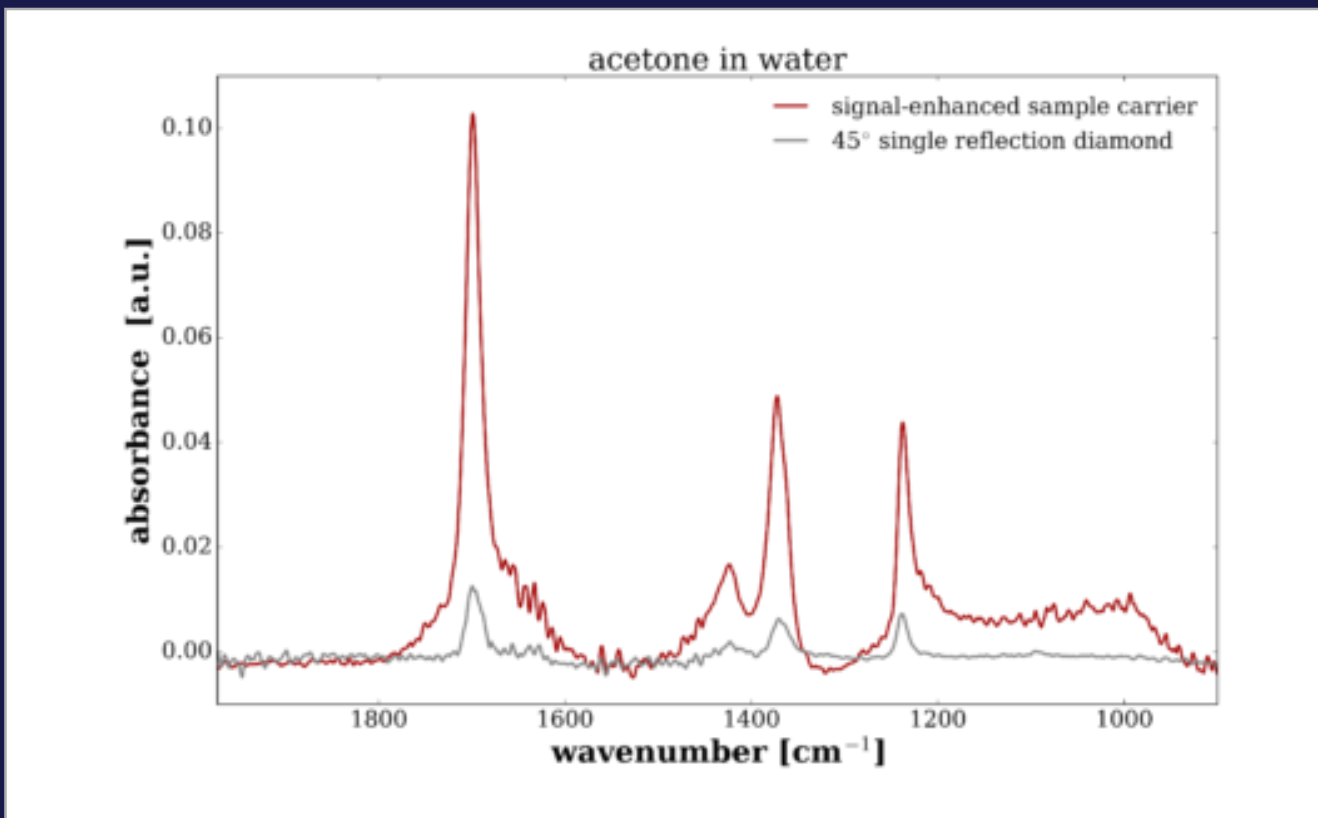
Specialized 2 ATR Crystal • Filter Effect



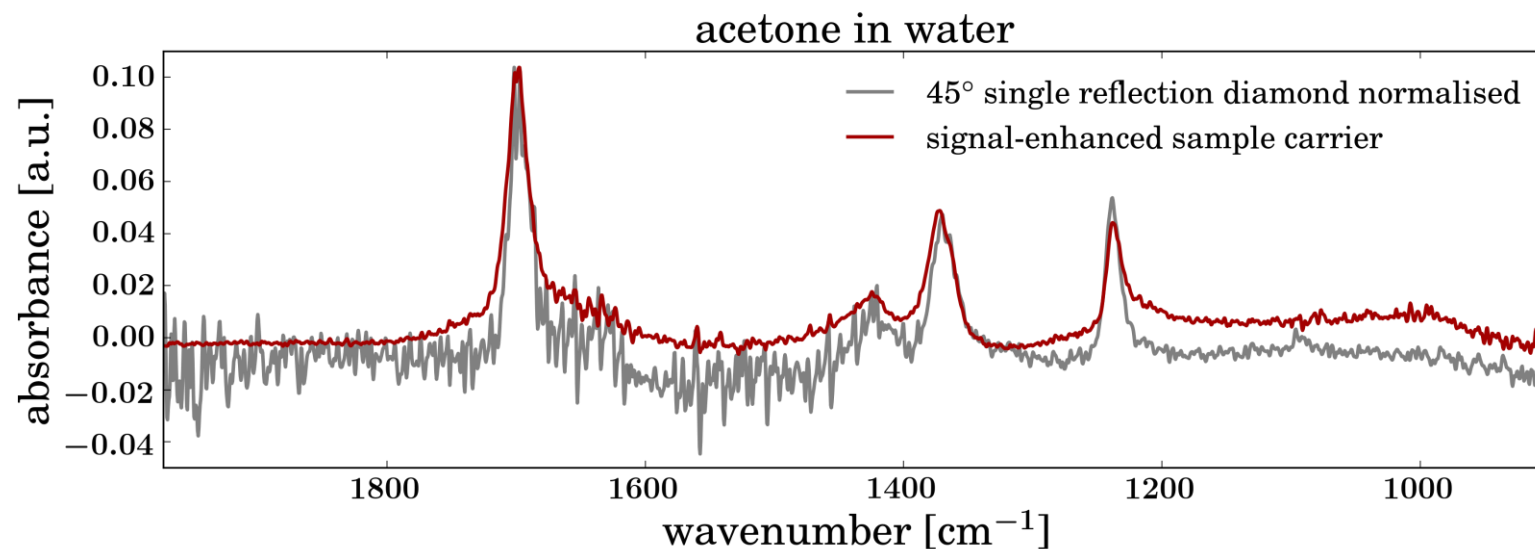
The microstructured surface of the carrier acts like a plasma filter and separates the blood plasma from the blood cells.

Therefore, centrifugation is not required as only the plasma in between the microstructures is being screened by the IR beam.

Specialized 2 ATR Crystal • Sample Spectra



Specialized 2 ATR Crystal • Sample Spectra



Pricing

Universal / Specialized 1

Quantity (pcs)	Price per Unit (€)
1-2	75
3-9	57
10-19	52
20-49	49.50
> 49	On Request

Please note: The SEIRAS Optimized Crystal comes without the gold layer.

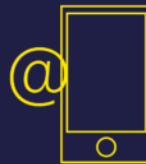
Specialized 2

Quantity (pcs)	Price per Unit (€)
To be announced	

Prices are displayed without tax and are subject to change.



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