



The Quest
Single Reflection ATR Accessory

User Manual



List of Safety Symbols

Safety Symbol	Meaning
	Caution! indicates Important information which needs to be followed for the safe operation of this accessory.
	Caution! – Hot Surface where used indicates the product contains heated surfaces which need to be taken into consideration while handling and operating this device
	Caution – Possibility of Electric Shock
	Indoor Use Only



Quest Heated Puck User Manual

The Quest Single Reflection ATR Accessory

P/N GS10800

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1. Introduction

Thank you for buying a Specac product. We trust it will provide you with invaluable and excellent service in use.

The Quest Single Reflection ATR Accessory is designed for the quantitative and qualitative analysis of solids, powders, liquids, pastes and gum-like samples using mid-IR spectroscopy at a nominal 45° incident angle under ambient or elevated temperature conditions.

The Quest is based upon Synopti-Focal technology – an innovative synoptic focusing array of highly reflective gold coated mirror only optics – in an optical unit fitted with interchangeable ATR puck assemblies (choice of diamond, ZnSe, Ge or Si). The ATR crystal is mounted in either a Standard (flat), Liquid or Heated Puck Assembly. For solid samples, where good contact with the ATR crystal is required, a clamp arm produces a highly reproducible load of 40 lbs.

The use of mirror optics maximizes the spectral range as follows:

ATR Crystal	Notes	Range (cm⁻¹)
Diamond	AR Coated	7800 - 400
	Non-AR Extended Range	10000 - 10
ZnSe	AR Coated	7800 - 500
	Non-AR heated puck	7800 - 500
Ge	AR coated	5500 - 500
Si	Non-AR coated	8333-1350 and 500-33
Arrow (Si wafer)	Thin Wafer	8333-33

Specular Reflectance measurements are also possible by the use of a specular reflectance puck at a nominal 45 ° angle.

2. Safety



Caution! Always use personal protective equipment (PPE) when operating this device and follow local safety operating procedures and practices with respect to potential toxic and flammable sample substances.

Make sure that all samples intended to be used with the ATR are chemically compatible with the accessory surfaces, including:

- The ATR crystal material (diamond, ZnSe, Ge, or Si)
- The indium sealing material around the crystal.
- Stainless-steel used in the puck and anvil components.
- Anodized aluminum & Viton O-ring in the volatiles cover.
- For Arrow only: polypropylene slide, thermoelastic seal (SBS-SEBS), anodized aluminum puck.

Safety data sheets (SDS) are available in the product support section of the Specac web site where required and are provided with each crystal type. As an alternative please contact your Specac representative for further details.

It is recommended to wear suitable gloves and eye protection PPE at all times when using this device.



Important! This manual should be read in conjunction with the Arrow QS user manual where applicable.



Important! This manual should be read in conjunction with the manual for the heated puck and USB temperature controller where applicable.

3. Checklist of Contents

The Quest ATR Accessory is provided in its own specific packaging.

The items that require checking upon delivery depend on which Quest ATR system has been ordered.

Please check for the following standard items:

- 1 x Quest ATR Accessory including optical unit
- 1 x Flat anvil P/N GS10820
- 1 x Pellet anvil P/N GS10821
- 1 x Pair of purge bellows P/N GS10707
- 1 x Volatiles cover P/N GS10825
- 1 x Ball driver 3.0 mm (for optical unit cover plate removal)
- 1 x Ball driver 2.5 mm (for mirror adjustment in optical unit)
- 1 x Purge port plug kit
- 1 x Benchmark™ baseplate for your FTIR spectrometer
- 1 x USB manual

Along with any Puck assemblies included with your order, which may include:

- ATR Flat puck (choice of diamond, ZnSe, Ge or Si)
- ATR Liquid puck (choice of diamond, ZnSe, Ge or Si)
- Arrow Puck and 100 Slides
- Heated puck (choice of diamond or Znse)
(consult relevant manuals for checklist of parts)
- Specular Reflectance Puck

Carefully remove your Quest ATR Accessory and ATR puck assembly(s) from the packaging in readiness for use.

4. “Bubble Numbers” Part Identification List

- 1) Optical unit thumb screw. (Figure 5-1).
- 2) Location slot of ATR puck assemblies (Figure 5-3).
- 3) Location pin on top surface of the optical unit (Figure 5-4).
- 4) Magnetic catch for ATR puck assemblies (Figure 5-4).
- 5) Front cover plate of optical unit (Figure 6-1).
- 6) Captive screw of front cover plate (Figure 6-1).
- 7) Grub screw for M6 mirror rotation (Figure 6-3).
- 8) Cap head screw for M6 mirror tilt (Figure 6-3).
- 9) Grub screw for M3 mirror rotation (Figure 6-3).
- 10) Cap head screw for M3 mirror tilt (Figure 6-3).
- 11) Grub screw for M1 mirror rotation (Figure 6-3).
- 12) Cap head screw for M1 mirror tilt (Figure 6-3).
- 13) Aperture port on optical unit (Figure 7-1).
- 14) Purge tube location port in front cover plate (Figure 7-1).
- 15) Curved grip plate for purge tubing in front cover plate (Figure 7-2).
- 16) Purge bellow (Figure 7-3).
- 17) Flat or Pellet Anvil (Figure 8-3).
- 18) Clamp arm assembly (Figure 8-3-figure 8-3).
- 19) Anvil storage port (Figure 8-3-figure 8-3).
- 20) Torque screw knob (Figure 8-3).
- 21) Volatiles cover (Figure 10-1).
- 22) Luer liquids flow anvil (Figure 10-3).
- 23) Specular reflectance puck (Figure 10-4).
- 24) Reference mirror for specular reflectance puck (Figure 10-4).

5. Installation

5.1. Mounting the Quest into the Spectrometer sample compartment

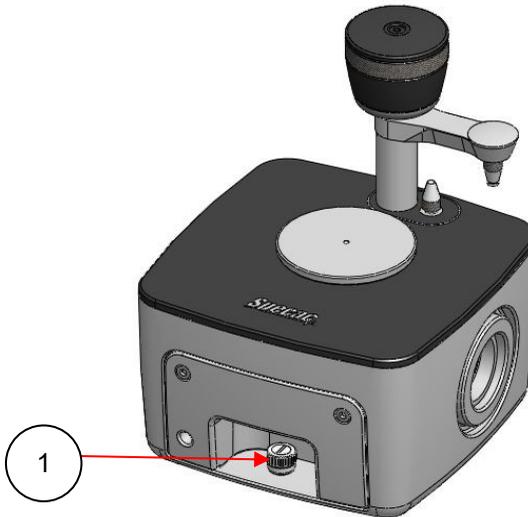


Figure 5-1: Quest ATR Accessory – Optical Unit and ATR Puck Assembly

The Quest ATR Accessory is supported on a Benchmark™ baseplate when installed into a spectrometer. A Benchmark™ baseplate has three pillars across the front for location/fixing and a fourth to the rear for support only. The thumb screw (1) at the front of the Quest ATR optical unit screws into the front central pillar, while the outer studded pair locate in slots beneath the Quest unit."

Note: *Install the Benchmark™ baseplate in the spectrometer first before locating the Quest ATR Accessory.*

Fixing holes and studs in the Benchmark™ baseplate will vary depending upon the make and model of the spectrometer. Refer to the Benchmark™ baseplate Installation Guide/User Manual.

5.2. Quest Puck Assembly

5.2.1. Quest ATR Puck Assemblies Identification

Top and underside views of the Quest ATR Flat and Liquid puck assemblies are shown in Figure 5-2 and Figure 5-3.

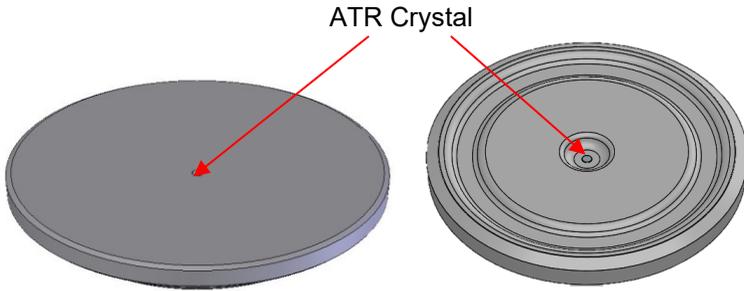


Figure 5-2: Top view of Quest ATR Diamond Crystal puck: Standard (left) and Liquids (right) Puck Assembly

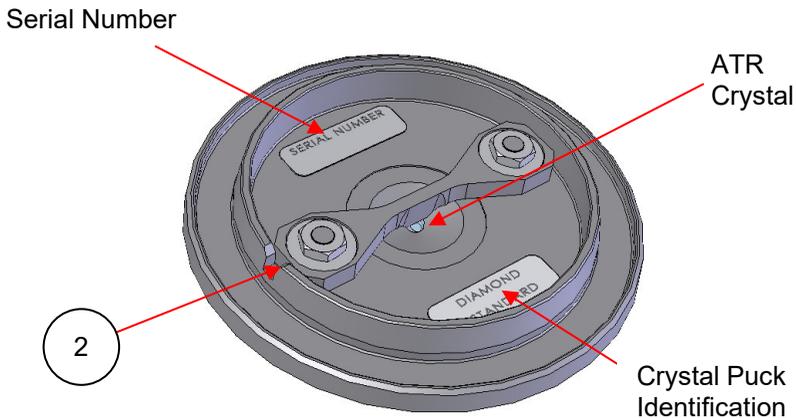


Figure 5-3: Underside view of Quest ATR Diamond Crystal Puck Assembly

Puck assemblies have an ATR crystal that protrudes from the top surface of the puck. Please refer to the Arrow/Heated puck manuals for more details on these pucks.

Note: The fixing nuts for the underside support bracket of the puck assembly will be covered with tamperproof red marking strips and these fixing nuts **should never be touched**. Any attempt to adjust these nut fixings will be identifiable and will invalidate any warranty for the puck assembly.

5.2.2. Fitting the Puck Assembly to the Quest

Install the puck assembly onto the Quest by lining up the alignment notch (2) in the puck with the locating pin (3) on the Quest top plate (see Figure 5-3 and Figure 5-4). Three magnets (4) capture and hold the puck in place when it is correctly positioned on the Quest ATR optical unit. Some puck assemblies (e.g. heated puck) may need to be firmly pushed into position.

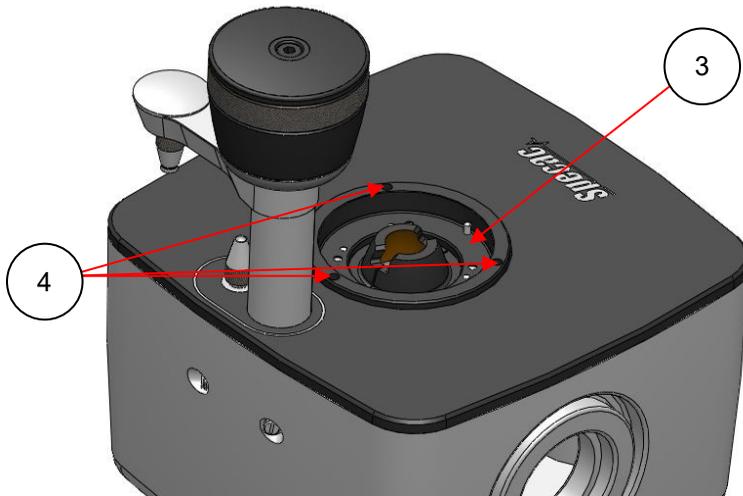


Figure 5-4: Top view of Quest ATR Optical Unit showing location area for the Puck Assemblies

6. Alignment Procedure for Quest ATR

The Quest ATR Accessory has been factory aligned with your choice of puck. However, it may be necessary to maximize the optical throughput for a specific spectrometer by adjusting the mirrors in the optical unit of the Quest ATR Accessory.

Set up your Quest as described above. For alignment purposes an ATR crystal puck should be fitted to the Quest. Alternatively, the Quest can be aligned using an Arrow puck + slide or a specular reflectance puck fitted with a reference mirror. Setup your spectrometer to monitor the energy throughput. The precise method of doing this will vary depending on your spectrometer and software. Please refer to your spectrometer manual for further information. If no energy throughput is observed, please refer to page 16.

An overall spectral throughput of light energy between 10% and 35% of the open beam energy should be achievable, depending upon the ATR puck assemblies and spectrometer used.

6.1. Front Cover Removal

The optical unit front cover plate (5) is removed by undoing the two captive cover plate screws (6) (see Figure 6-1) using the 3 mm ball driver supplied. The front cover plate (5) is pulled up and forward over the fixing thumb screw (1) to gain access to the internal mirrors.

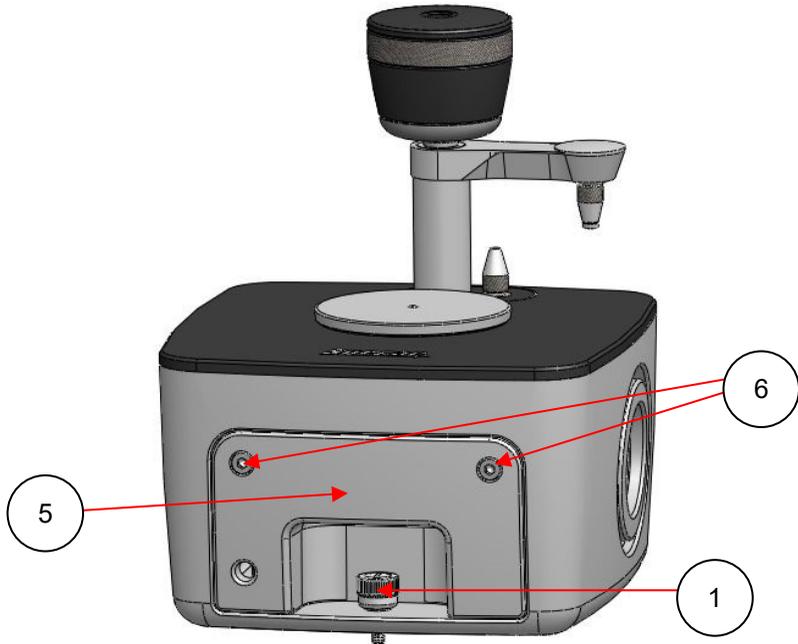


Figure 6-1: Quest ATR - Front Cover Plate Removal

6.2. Synopti-Focal Mirror System

The Synopti-Focal mirror arrangement is shown in figure 5-2. For a right-to-left beam direction, the beam strikes the mirrors in the following sequence from source-side (S) to detector-side (D):

S, M1, M2, M3, M4, ATR Crystal, M5, M6, D

A left to right beam direction spectrometer inverts the order of the mirrors between the source and detector. The mirrors M1, M2, M3 and M6 are flat, gold coated mirrors. (M6 is the slightly larger sized mirror). Mirrors M4 and M5 are aspheric, focusing gold coated mirrors. The angle of incidence for the IR light beam when it interacts at the crystal/sample interface surface is nominally set at 45°.

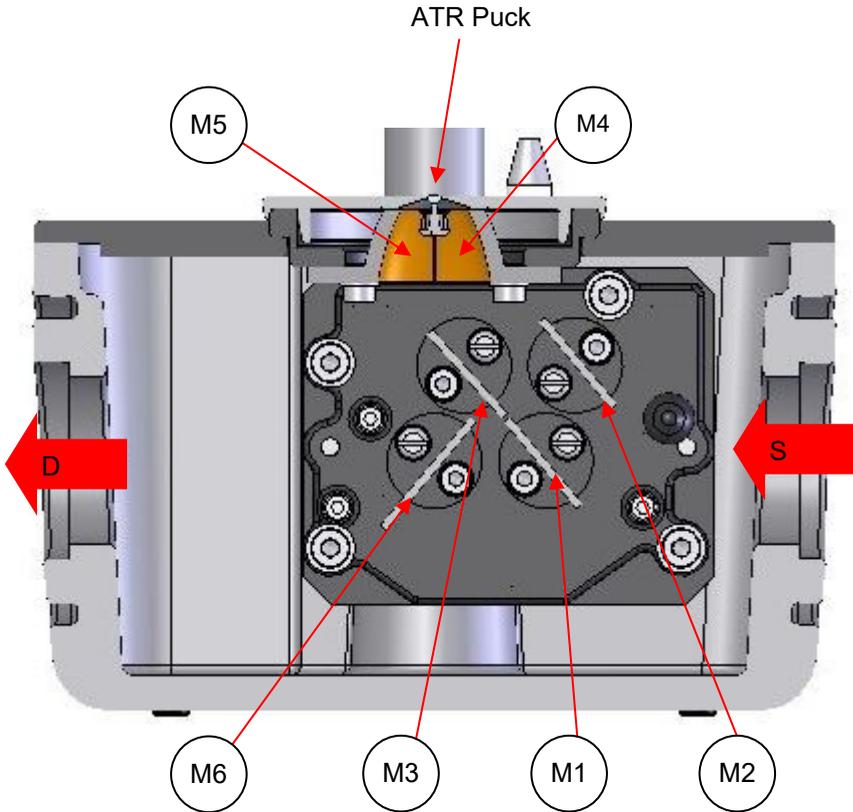


Figure 6-2: Cutaway front view of Quest ATR Accessory showing the Synopti-Focal arrangement of mirror components

6.3. Alignment Procedure

The alignment procedure consists of adjusting mirrors M1, M3 and M6 mirrors, optimizing first **rotation** then **tilt**.

Note: The mirrors M2, M4 and M5 do not require adjustment. A cover has been placed over the rotation adjustment screw for mirror M2 to prevent adjustment.

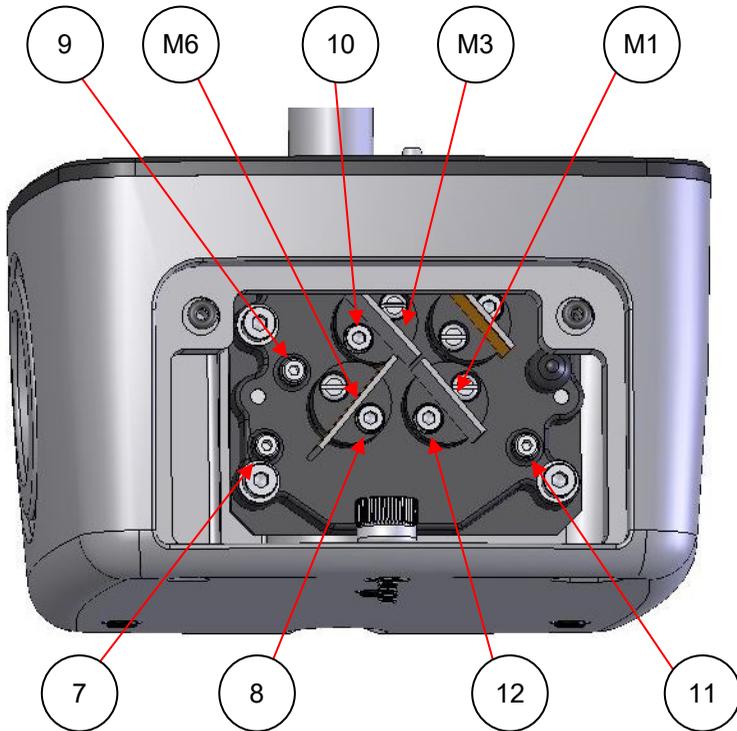


Figure 6-3: Access to Mirrors M1, M3 and M6 - Cover Plate Removed

1. Using the 2.5 mm ball driver tool supplied, adjust the **rotational alignment** of the mirrors M6, M3 and M1 in that sequential order, via the grub screws, (7), (9) and (11). Carefully adjust each mirror one at a time, maximizing the energy signal as far as possible before moving onto the next mirror.
2. Again using the 2.5 mm ball driver, carefully adjust the **tilt alignment** of the mirrors using the grub screws labeled (8), (10) and (12) in turn for these three mirrors (in the same sequence) to maximise the energy.
3. Repeat steps 1 and 2 a second time to obtain the best possible alignment.

When satisfied after one or two adjustment sequences have been carried out that an acceptable throughput energy has been established, the front cover plate (5) can be repositioned onto the optical unit.

For some spectrometer configurations, if the Benchmark™ baseplate is mounted on a rail or is movable in the spectrometer, further improvements may be possible by adjusting the position of the Quest. Firmly secure the Benchmark™ baseplate with the Quest Accessory into this new position before use.

Note: In some spectrometers it may be necessary to remove the Quest ATR optical unit before securing the baseplate. Where this is the case, ensure that the Benchmark™ baseplate does not move when removing the Quest ATR optical unit.

6.4. Procedure to Follow from Any Accidental Mis-Alignment

If a mistake is made during the alignment procedure and no signal from the detector can be obtained, then it may be possible to recover the situation by making a rough **visual** alignment of the mirror optics M1, M3, and M6. This will allow enough energy to reach the detector for the alignment procedure described above to be followed.

Note: The following procedure should also be used if no energy is observed at the detector on installation.

1. Ensure the fault is with your Quest unit by removing the accessory and checking for a signal to show that the spectrometer is functioning correctly (consult Spectrometer manual/dealer for more information).
2. Remove the Benchmark™ baseplate, front cover plate (5) and any puck assembly from the top of the optical unit.
3. Using the 2.5 mm ball driver tool in the screws (8), (10) and (12), adjust all three mirrors M1, M3 and M6 **ONLY** for their angle of tilt such that these mirror surfaces are **normal** (i.e. at a 90° right angle) with relation to the **back plane** of the main mirror mount frame assembly.

4. Adjust the rotation of mirrors M3 and M1 using grub screws (9) and (11) to form a straight line. Refer to Figure 6-2.
5. Adjust Mirror M6 using grub screw (7) until it is approximately perpendicular to the plane of mirrors M3 and M1, as shown in Figure 6-2.
6. With the three mirrors M1, M3 and M6 now roughly positioned for their tilt and rotation angles, the optical unit can be placed back onto the Benchmark™ baseplate within the spectrometer compartment and the puck fitted back on top of the optical unit.
7. Set up your IR spectrometer to monitor the energy throughput. If there is still **no signal** after the procedural steps above have been completed, then turning the grub screw (7) for rotation of the mirror M6 (first one way and then the other), which should lead to the energy level signal returning.
8. There should now be some energy level indication (however small), at the detector after passage of light through the Quest ATR Accessory and so the fine alignment procedure can now be followed starting with rotation of mirror M6 as described from step 1) on page 15 of this instruction manual.

7. Purging the Quest ATR Optical Unit

The Quest is fitted with an optional purging port into which 1/4" tubing can be inserted. This is useful for suppressing atmospheric water vapor and/or CO₂ with inert gas from a cylinder or from a purge gas generator. To fit a purge line remove the front cover plate (5), push your tube through the purging port (14) and secure in place using the curved grips (15), as shown in Figure 7-1 and Figure 7-2. Then refit the front cover plate (5).

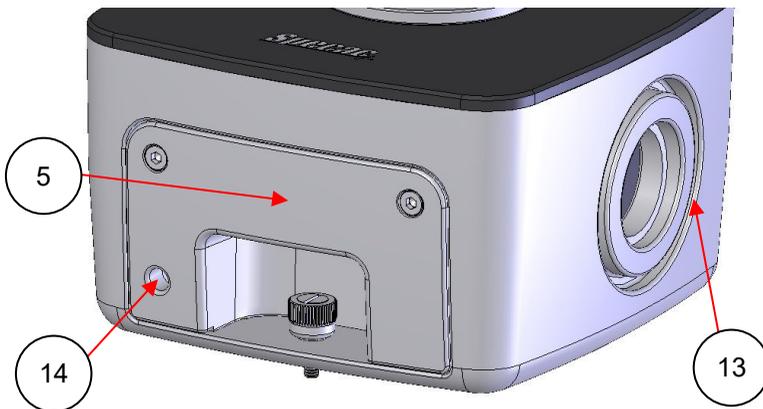


Figure 7-1: Aperture Ports and Purge Connection on the Quest ATR Optical Unit

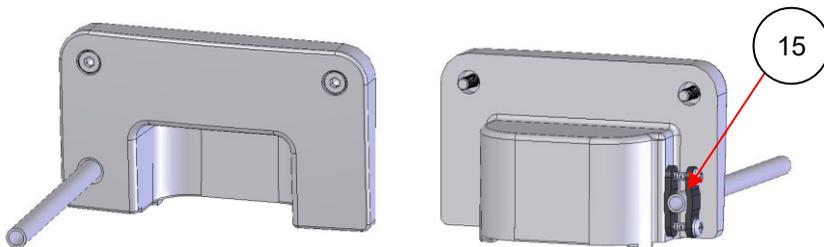


Figure 7-2: Front Cover Plate with Purge Tube – Front and Back Views

When not in use the purge port can be blocked with the supplied purge port plug kit (tube and grub screw). The grub screw is fitted into the tube and installed in the purge port as described above.

A pair of purge bellows (16) (P/N GS10707) are supplied to help maintain the purged environment inside the accessory. They attach to the accessory's two aperture ports (13) and seal the gaps between the accessory and the spectrometer bulkhead (see (see Figure 7-1 and Figure 7-3.)

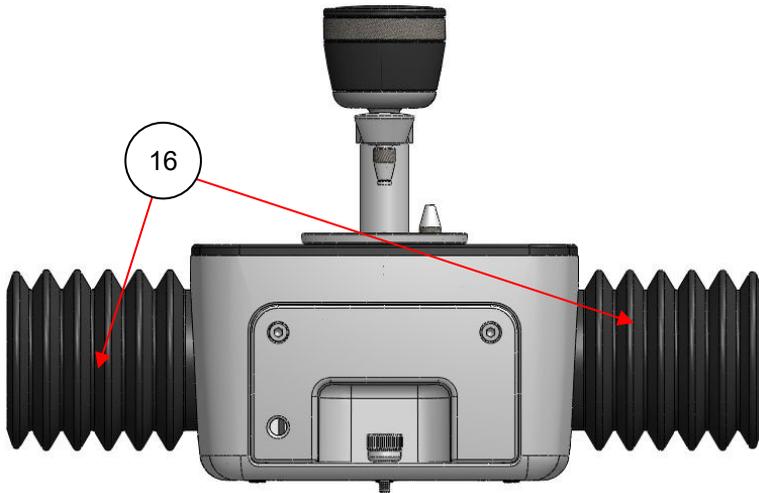


Figure 7-3: Quest ATR Accessory fitted with Purge Bellows

The purge bellows (16) are installed by a push fit to the aperture ports (13) of the Quest. If the gap/distance between the optical unit and bulkhead is small, the purge bellows can be cut to size for a better fit. It is best to cut along one of the ridged grooves. For optimal results ensure a flush fit with the inlet/outlet bulkhead faces of the spectrometer sample compartment

Tip: *It is recommended that purge bellows (16) are fitted during use to help stabilize the spectrometer/instrument background even if purging is not to be carried out.*

8. Quest ATR Clamp Arm and Anvils

8.1. Clamp Arm Assembly

When using the Quest ATR Accessory with a solid sample a load must usually be applied to ensure good contact between the ATR crystal and sample. To use: rotate the clamp arm assembly into the position shown in Figure 8-1, if necessary adjusting the height of the anvil (17) by adjustment of the Torque Knob (20). When in the correct position the arm will click into place. When not in use it can be rotated out of the way and will again click into the parked position.

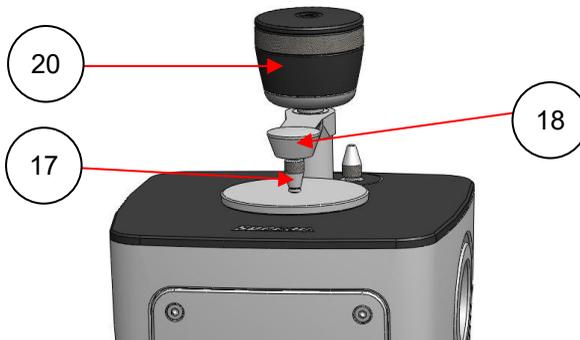


Figure 8-1: Clamp Arm Assembly with Flat Anvil in Sampling Position

8.1.1. Torque Limiter

To apply a load to the sample it should be placed onto the crystal with the anvil positioned directly over it. A load is applied by rotating the torque limited screw knob assembly (20) until it clicks three times. This will apply a consistent load of 40 lbs to your sample. Further rotation of the knob will not increase the load beyond 40 lbs.



Always apply force to the sample slowly, applying the load gradually via the clamping arm assembly. Beware of point loads, particularly with harder samples, which could damage your ATR crystal. An acceptable ATR spectrum for the sample may be produced without having to apply the maximum load.

8.2. Choice of Anvils

There are two different anvils (17) that can be used with the Quest ATR Accessory as follows:

- The flat anvil (Figure 8-2, left) has a self-levelling surface head and should be used for most solid and powder samples.
- The pellet anvil (Figure 8-2, right) has a concave recessed surface head designed to take round-shaped samples such as polymer beads.

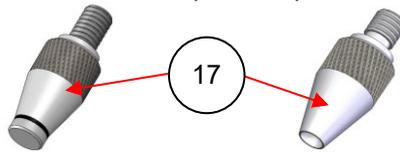


Figure 8-2 : Flat (left) and Pellet (right) anvils

Both anvils have a threaded screw fitting for attachment to the clamp arm assembly (18). The anvil which is not in use can be stored in the threaded location port (19), in Figure 8-3.

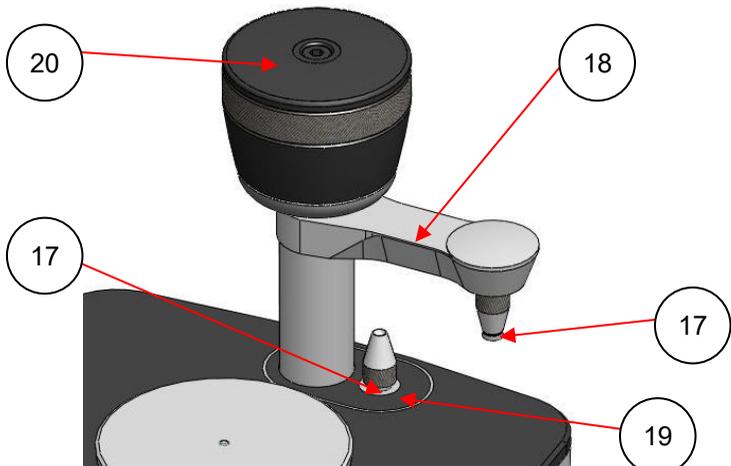


Figure 8-3: Anvil in Clamp Anvil Arm Assembly and in Storage Port

9. Sampling Using the Quest ATR Accessory

Once the Quest has been set up as described in previous sections, you may now begin recording spectra.

9.1. Background Acquisition

Ensure that the ATR crystal is clean and then record a background spectrum of your accessory (refer to your spectrometer manual for more information). It is not necessary to collect a new background between samples however frequent background collection will improve spectral quality (for instance by reducing the effect of atmospheric fluctuations)

9.2. Solid Sampling Procedure



This procedure must NOT be used with the Arrow system. Applying a load will break the ATR wafer which could result in your sample entering the Quest optics and damaging your Quest.

1. If required collect a background spectrum.
2. Place the sample on the crystal. The puck can be removed from the Quest to load a sample if required.

Note: For best results a small amount of sample should be used (sufficient to completely cover the crystal and no more).

3. Apply a load to the sample as described in section 8 (page **Error! Bookmark not defined.**).
4. Collect the ATR spectrum of the sample.
5. Release the load. The anvil can be rotated out of the way for access if necessary.
6. Remove the sample from the ATR crystal (taking care not to scratch it) and then clean the crystal and anvil (see page 24).

Sample type	Recommended Anvil	Notes
Powders	Flat Anvil	Minimal sample is required, providing the crystal is completely covered. To reduce risk of damage the sample should be finely powdered, with no hard lumps or inclusions.
Flat Solids	Flat Anvil	For best results and to avoid the possibility of damage, flat solid sample should be smooth and homogenous with no hard lumps or inclusions.
Pellets and Beads	Pellet Anvil	Pellet beads less than 1.5 mm in diameter are not suitable for use with the pellet anvil and should be analysed carefully using the Flat anvil.
Fibre Samples	Flat Anvil	Lay the fibre(s) centrally across the ATR crystal surface. If necessary, the ends of the fibre can be taped down to hold them in position before applying a load from the anvil.

9.3. Liquid Sampling procedure

The procedure for collecting a liquid sample is broadly the same as a Solid, with the exception that no load needs to be applied to the sample (i.e. skip steps 3 and 5).



Sample solutions that fall within the pH range of pH5 to pH9 are tolerated by the ZnSe crystal material. Stronger acids and bases will damage ZnSe irreparably.

For liquid sample types Specac offer several different options for containment.. Viscous samples and samples with high surface tension can be used on the Standard puck. The Liquids puck has a well around

the crystal for sample containment. Likewise, the Arrow consumable ATR slide system also contains a well for sample containment. There are also the options of the Luer Lock anvil (see “10.2 Luer Liquids Flow Anvil”, page 27) or the Volatiles Cover (See “10.1 The Volatiles Cover”, page 26).

9.4. Cleaning Tips

It is very important to avoid damage to the crystal materials. It may be useful to remove the puck from the optical unit and carry it to a safe area for cleaning in order to minimize any risk of contamination being carried over to other components of the accessory.

Solvents such as water, methanol and acetone are suitable to use for cleaning purposes. When wiping away any solid or liquid sample, use very soft lens tissues to avoid scratches being caused on the surface of the ATR crystal, particularly if using the ZnSe, Ge or Si pucks as these crystal materials are not as resilient as diamond. Scratches and blemishes to the ATR crystal surface will result in poor light throughput for the ATR technique and an overall degradation in the accessories performance.

Note: When cleaning the flat anvil (17), do not soak the contact tip head with solvent as this degrades the nitrile washer component. Carefully wipe the stainless-steel tip head only using moistened or dry tissues to clean it.

In common and general usage, it will only be necessary to wipe and clean away at the top surface of any Quest ATR puck between samples. Avoid getting any solvent or cleaning solution materials on the underside of the puck. There is a risk that any dried solution components on the underside of the ATR puck could be observed as an impurity in the background.

9.4.1. Diamond Crystal

The diamond crystal material is much more chemically durable than either the ZnSe, Ge or Si puck options. Therefore, if a sample is stubbornly resistant to removal from the crystal surface, a more vigorous

method of cleaning may be carried out for the diamond material than could be achieved with the ZnSe or Ge puck options. More aggressive solvents and abrasive cleaners could be considered for use to remove the sample, if necessary.



Warning: Aggressive cleaning procedures suitable for diamond will very likely cause irreparable damage to ZnSe or Ge materials. Make sure the cleaning procedure is suitable for the crystal material employed.

10. Quest Sampling Accessories

10.1. The Volatiles Cover

Included with the Quest ATR Accessory is a volatiles cover (21), compatible with the Standard and Liquid Pucks. A larger volatiles cover is supplied with the heated puck. This can be used for sampling and containing liquid samples, particularly when they are volatile. The volatiles cover is a flat circular plate with an O-ring on the underside for sealing and a location groove on the top (See Figure 10-1). To use, place your sample onto the ATR crystal, place the volatiles cover over the sample and then clamped into position using the Flat Anvil (see page 20) as shown in Figure 10-2.

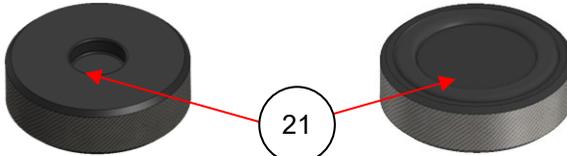


Figure 10-1: Volatiles Cover (top view left – underside view right)

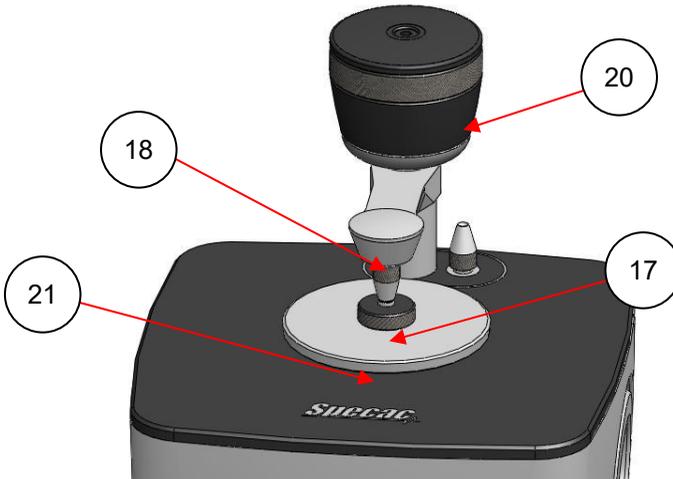


Figure 10-2: Volatiles Cover clamped into position using the Flat Anvil with the Clamp Arm Assembly

10.2. Luer Liquids Flow Anvil

A Luer Liquids Flow Anvil (22) is also available for longer duration experiments with liquids. Figure 10-3 shows top (left) and underside (right) views of the Luer Liquids Flow Anvil (22).

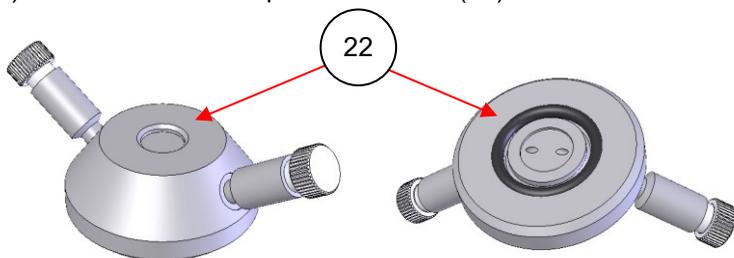


Figure 10-3: Luer Lock Liquids Anvil

The anvil (22) is placed centrally over the ATR crystal and then clamped into position using the Flat Anvil (17) (see page 20). A liquid sample can then be injected into the anvil (22) through either one of the Luer port connections and then sealed using PTFE caps in the Luer port connections.

10.3. The Specular Reflectance Puck

Flat surface films can be measured by the specular reflectance technique. An optional specular reflectance puck assembly (23) with an open aperture hole of 3.8 mm diameter allows the IR light beam to be projected directly to a solid sample surface.

A reference mirror (24) is also provided with the specular reflectance puck (24) for collection of a background spectrum, by placing the reflective surface of the mirror (24) **face down** over the aperture hole. The sample should then be placed over the hole and a sample spectrum recorded.

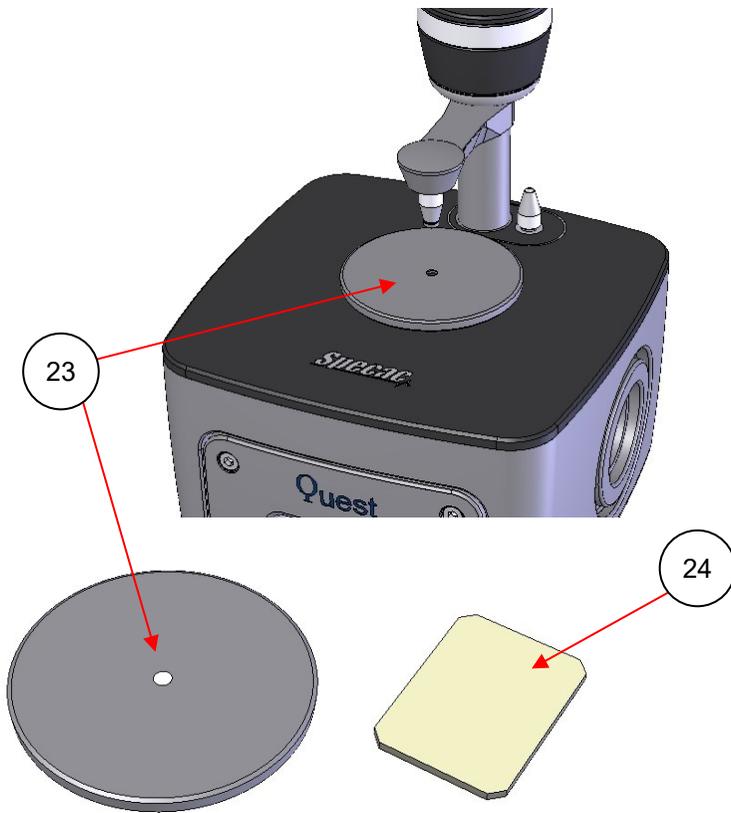


Figure 10-4: Quest Specular Reflectance Puck and Reference Mirror

11. Quest ATR Part Numbers and Spares

Complete Accessories – (Optical unit with clamp arm assembly, and ATR puck option and Benchmark™ baseplate)

GS10800	Quest ATR Diamond Accessory
GS10801	Quest ATR Diamond Extended Range Accessory
GS10802	Quest ATR ZnSe Accessory
GS10803	Quest ATR Ge Accessory
GS10804	Quest ATR Si Accessory
GS10884	Quest ATR Arrow Accessory with 100 slides
GS10894	Quest ATR Heated Diamond Extended Range Accessory
GS10895	Quest ATR Heated ZnSe Accessory

Optical unit with clamp arm assembly and Benchmark™ baseplate

GS10805	Quest ATR (Requires a Puck Assembly for use)
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Puck Assemblies

ATR Crystal Pucks			
Crystal \ Puck Type	Standard (Flat)	Liquid	Heated
Diamond	GS10810 [†]	GS10860 [†]	N/A
Diamond - Extended Range	GS10811	GS10861	GS10890 ^a GS10892 ^b
ZnSe	GS10812 [†]	GS10862 [†]	GS10891 ^a GS10893 ^b
Ge	GS10813 [†]	GS10863 [†]	N/A
Si	GS10819	N/A	N/A
Arrow ATR System			
Arrow Aluminium Puck + 100 Slides			GS10885
Arrow Aluminium Puck (Requires Arrow Slides)			GS10883
Arrow Slides - Refill Pack of 100			GS10882
Specular Reflectance Puck			GS10816

[†]The ATR crystals of these puck assemblies have an antireflection (AR) coating on their underside surfaces for improved light throughput

^a Includes USB Temperature Controller

^b No USB Temperature Controller

Spare Parts and Accessories

GS10816	Quest Specular Reflectance Puck
GS10820	Quest ATR Self Levelling Flat Anvil
GS10821	Quest ATR Pellet Anvil
GS10822	Quest ATR Luer lock liquids anvil
GS10825	Quest ATR Volatiles Cover
GS10503	Quest ATR Heated Puck Volatiles Cover
GS10882	Arrow 100 Slide Pack
GS10707	Purge Bellows (pair)

12. Quest ATR Technical Specifications

	ZnSe	Ge	Diamond	Si
ATR Crystal Active Area	3.4 mm dia.	3.4 mm dia.	1.8 mm dia.	3.4 mm dia
Angle of Incidence	45 °			
Accessory Transmission Range / cm ⁻¹	7800 - 500 (AR coated)	5500 - 500 (AR coated)	7800 - 400 (AR coated) 10,000 - 10 (Extended)	8000 – 33 (absorbs between 1350 – 500)
Refractive Index at 1000 cm ⁻¹	2.43	4.0	2.40	3.42
Depth of Penetration (For Sample Refractive index 1.5 @ 1000 cm ⁻¹)	2.0 µm	0.7 µm	2.0 µm	0.9 µm
ATR Crystal Plate Assembly	ZnSe	Ge	Diamond	Si
	sealed with indium into stainless-steel puck			
Applied Force From Clamp Anvil	40 lbs			
Maximum Compression Head (Anvil) Travel	18 mm			
Quest ATR Accessory Weight	1.6 Kgs			
Quest ATR Dimensions	150 x 150 x 180 mm (W x D x H)			

13. Quest ATR Serial Numbers

Your Quest ATR Accessory will be provided with a unique serial number which can be found on the exterior of the packaging box and also on the rear of your Quest accessory. Puck assemblies have their own unique serial number which can be found on the underside of the puck. It is advisable to make a note of these numbers for future reference. If you need to contact Specac for any issues regarding your Quest ATR Accessory, it may be necessary to provide the serial number of the item to identify for replacement parts.

Worldwide Distribution

France

Eurolabo - Paris.
Tel.01 42 08 01 28
Fax 01 42 08 13 65
email: contact@eurolabo.fr

Germany

L.O.T. - Oriel GmbH & Co,
KG - Darmstadt
Tel: 06151 88060
Fax: 06151 880689
email:info@LOT-Oriel.de
Website: www.LOT-Oriel.com/de

Japan

Systems Engineering Inc. -Tokyo
Tel: 03 3946 4993
Fax: 03 3946 4983
email:systems-eng@systems-eng.co.jp
Website: www.systems-eng.co.jp

Spain

Teknokroma S.Coop C. Ltda Barcelona
Tel: 93 674 8800
Fax: 93 675 2405
email: comercial@teknokroma.es

Switzerland

Portmann InstrumentsAG
Biel-Benken
Tel: 061 726 6555
Fax: 061 726 6550
email: info@portmann-instruments.ch
Website:www.portmann-instruments.ch

USA

SPECAC INC.
414 Commerce Drive
Suite 175,
Fort Washington,
PA 19034, USA
Tel: 215 793 4044
Fax: 215 793 4011

United Kingdom

Specac Ltd.
Science and innovation Centre
Unit 12
Halo Business Park
Orpington
London
BR5 3FQ
Tel: +44 (0) 1689 873134

Brilliant Spectroscopy™

www.specac.com

SPECAC INC.
414 Commerce Drive
Suite 175,
Fort Washington,
PA 19034, USA
Tel: 215 793 4044
Fax: 215 793 4011

SPECAC LTD.
Science and Innovation Centre,
Halo Business Park,
Cray Avenue,
Orpington,
Kent BR5 3FQ
Tel:+44 (0) 1689 87313