

Case Study

Client: Specac Ltd

Industry Sector: Scientific & Life Sciences Instrumentation

Project Name: ATR Spectrometry Accessory

Scope: From prototype to production & precision milling

Technical Plastic Moulders

Your trusted plastics partner

For the development of a new ATR (Attenuated Total Reflection) accessory for Specac's high-spec spectrometry instrument Broanmain Plastics provided tooling design support and project managed the entire process from prototype to production. The process involves precision milling and individually finishing 100+ spectrometry ATR units a month, each comprising seven individual components.

For this specific project, Broanmain invested in a state-of-the-art vertical CNC Hurco VM10i milling machine. Equipped with a 10K RPM spindle and full Renishaw probing system, the mill accomplishes complex and repeatable 3D and 2D geometries and delivers better surface finishes on the most intricate of parts. Accuracy is further enhanced with the assistance of Renishaw's TS27R tool setter and OMP400 part probe.

As a UK company that exports its spectrometry device to over 70 countries, being able to showcase British engineering on the world stage was clearly an influencer for Specac's Strategic Buyer Anthony Gomme. He comments: *"Being able to partner with a likeminded moulder that shares our engineering flair is important for both innovation and continuity. Right from the outset Broanmain has gone the extra mile. As well as helping up with the tooling design, we leaned on the team a lot for guidance on processing, tooling development and materials."*

Best of British

Based upon Specac's flagship Quest ATR accessory, the new unit is used by forensic, life science, pharmaceutical, food, polymer, academia and healthcare labs the world over to analyse samples, measure quality and maintain full traceability.

Processing precision is critical. As an infrared optical component, with mirrors and crystal materials slotting into exact places within

the ATR unit, everything has to be perfectly aligned. Achieving accuracy of the geometries and intricate cut outs cannot be accomplished by injection moulding alone.

One part within the unit involves repeatedly milling perfectly straight lines into a cylindrical component. It's a complex operation ensuring the 3-dimensional contours follow an exacting pattern in the curve.

To increase the tensile strength of the moulded component, Broanmain uses a special resin with glass fibres inserted.



Specac spectrometry units are used in forensic, life science, pharmaceutical, food, polymer, academia and healthcare labs throughout the world to analyse samples*

Increasing speed to market

"Broanmain's responsiveness, the ease of working with a single supplier, their tooling knowledge and general 'get-the-job-done' attitude has made such a difference to the speed we were able to bring this spectrometry advancement to market," comments Anthony.

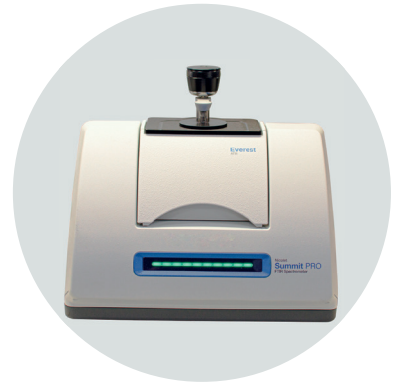
The new tool, made from steel, was designed and built in China under Broanmain's direction. Broanmain also generated some fast prototypes through a partner in Germany, to ensure the design was fit for purpose.

Finishing touches

Sourcing a very specific protective paint finish for the ATR's outer cover was necessary in order to meet Specac's blue chip clients' requirements. Applied Coating Technologies (ACT) successfully sourced the paint and developed the fine spatter finish in accordance with Specac's expectations.

Using trial plaques, ACT developed a process to achieve a fine spatter that matched a control plaque provided by Specac. This technique was later transferred to the mouldings. Stringent quality control procedures are in place to ensure the same finish is achieved with each ongoing batch.

In 2019, Specac named Broanmain their New Supplier of the Year. As a result of this project, Broanmain is currently assisting Specac with a revolutionary new project to create over-moulded disposable silicone chips to replace costly crystal and diamond specular reflectance pucks.



Broanmain moulds and individually finishing 100+ spectrometry ATR units a month for Specac.



Machining the fixture plates for the spectrometry ATR chassis at Broanmain's Dorking precision facility