CHRYSOS CORPORATION
Assays at the speed of light

Research & Development Roadmap

James Tickner

Research and Development Drivers

CHRYSOS CORPORATION

Advancing capability to enable sustainable growth

Quality and Resilience

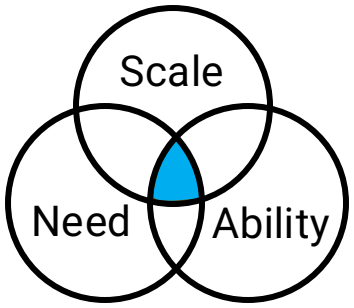
Supply chain resilience ensures providers are available for all critical components which cannot be produced in-house. Chrysos maintains practical ownership of its IP and the ability to freely build and support its equipment.

Performance delivery means Chrysos units continuously provide high-quality results that meet or exceed customer expectations. Data are fit-for-purpose and support miners meeting JORC or NI-43101 reporting obligations.

Reliability improvements mean instruments are always available when needed. Spare parts, maintenance and support staff requirements are minimised.

Ease-of-use units are straightforward to operate with minimal training. As far as possible, the quality of results should not depend on operator skill.

Continuing to develop our ability to independently manufacture, install and support units is critical to Chrysos' long-term growth



New opportunities must meet thresholds of scale, industry need and Chrysos' ability to deliver a unique solution

Broaden the Offering

New PhotonAssay™ services allow more to be done with existing units, often with no more than a software upgrade. New services include assaying a wider range of elements, or existing elements in different materials or matrices.

New technologies expand our analysis capabilities beyond PhotonAssay™, adding options for new elements or other material properties such as mineralogy or density. Preferred technologies build on Chrysos' strength of bulk analysis of large, unprepared samples.

Expanding up- and down-stream makes PhotonAssay™ a more compelling offering by reducing bottlenecks in sample preparation, data quality control and reporting. Provision of a more end-to-end service is especially relevant for mine-site installations.

Expanding Footprint in the Mining Data Chain

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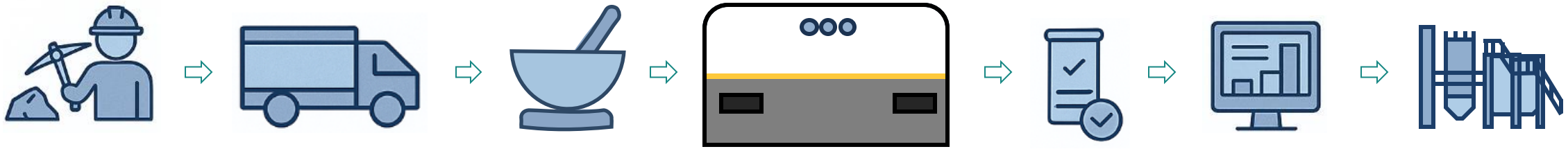
Delivering faster and more reliable analysis results for more materials

Automated sample preparation significantly **reduces onsite labour** requirements. It improves **turnaround times** and provides better **consistency**.

Opportunities to integrate preparation and PhotonAssay™ for smarter sampling decisions.

Lab manually dries, crushes and splits samples into jars. These are then scanned and run through PhotonAssay™ units for Au, Ag and/or Cu. Automated QC is performed and data quality reviewed. Batch results are reported to the lab or client laboratory information management system (LIMS).

Aggregation of PhotonAssay™ and sample metadata into one online portal. Enhanced quality control and reporting tools provide **better transparency of data provenance for end-users**. Opportunities to prioritise urgent samples and push results directly to specific endpoints, e.g. plant or mine control systems.



COLLECTION **TRANSPORT** **PREPARATION** **ASSAY** **QC** **REPORTING** **ACTION**

Generate **additional revenue** from existing deployed PhotonAssay™ unit base, either from better utilisation or simultaneous services.

New elements etc, measured directly on existing PhotonAssay™ sample jars

Overcome resistance where the client needs additional services beyond Au, Ag and Cu. Reduce the need for additional laboratory staff, space or equipment.

PhotonAssay™ - The Next Generation

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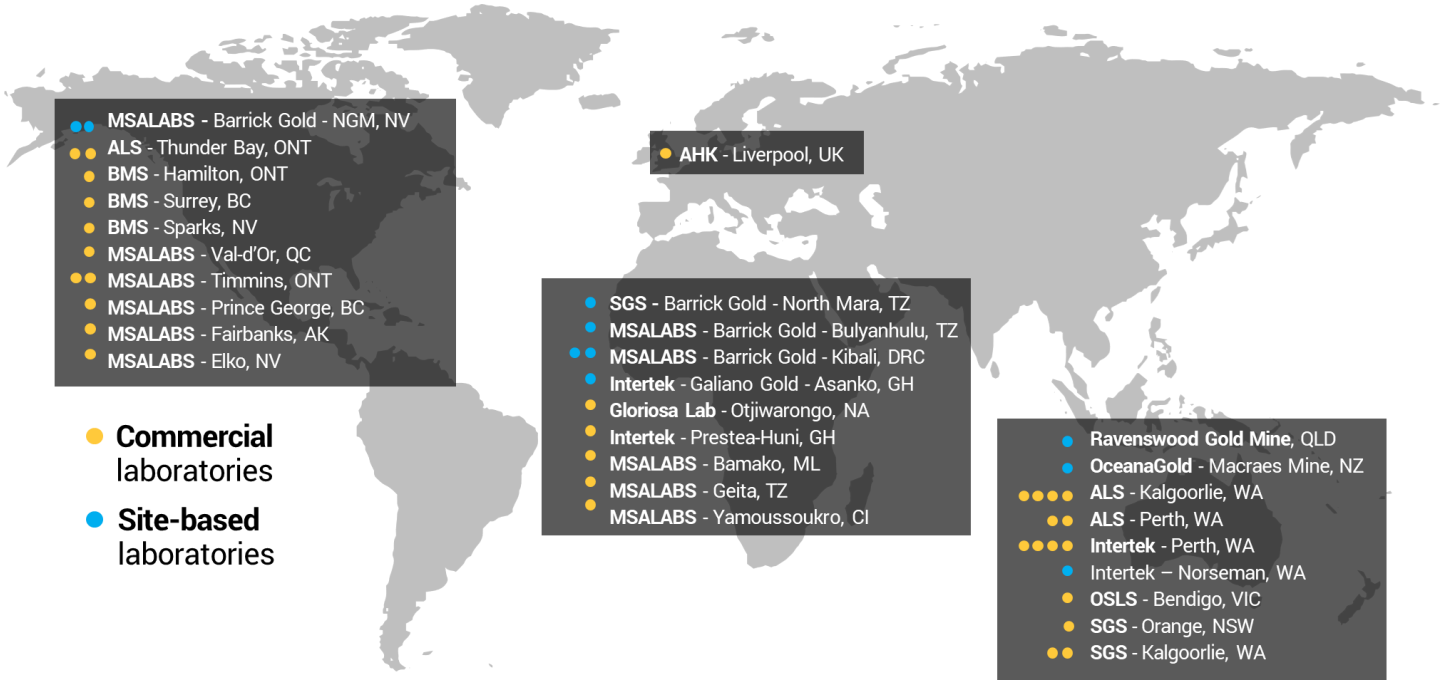
Improving quality, resilience and performance

41 Units Deployed

(at 24 November 2025)



Generation 2 – parallel supply chains

XC units target the North American market including the US, Canada and Mexico. They include US-made X-ray sources and detectors and Australian-sourced automation and shielding components. Other components are wholly designed and sourced by the Chrysos team.

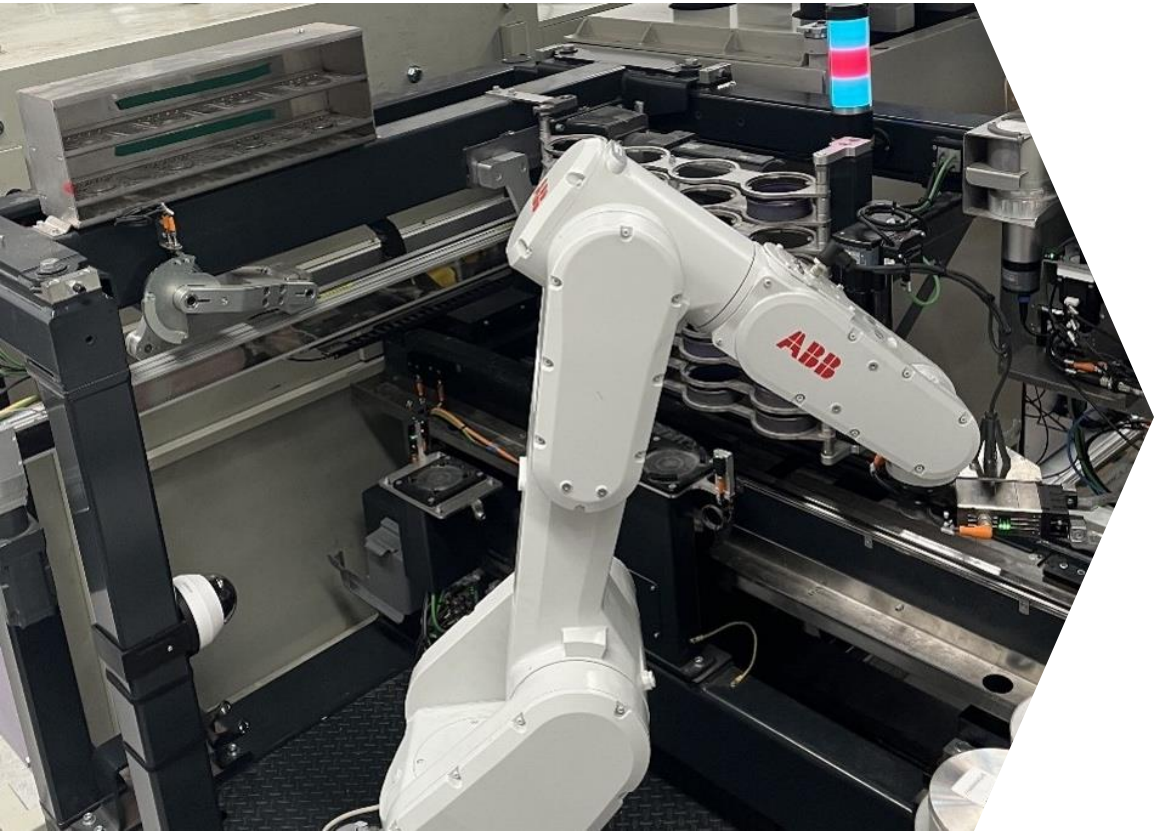
XN units are manufactured in partnership with our existing supplier, Nuctech Technology Ltd. They include upgraded versions of the X-ray source, a wholly new automation system and a smaller footprint.

Robotic automation used in both systems is a substantial upgrade on the Gen-1 units, designed for higher reliability and availability. It offers more flexible operation and higher sample throughput.

Ease-of-use is improved by internalising several operator functions, including sample mass and fill registration, instrument calibration, standard insertion for performance monitoring and handling of naturally radioactive samples.

PhotonAssay™ - XC

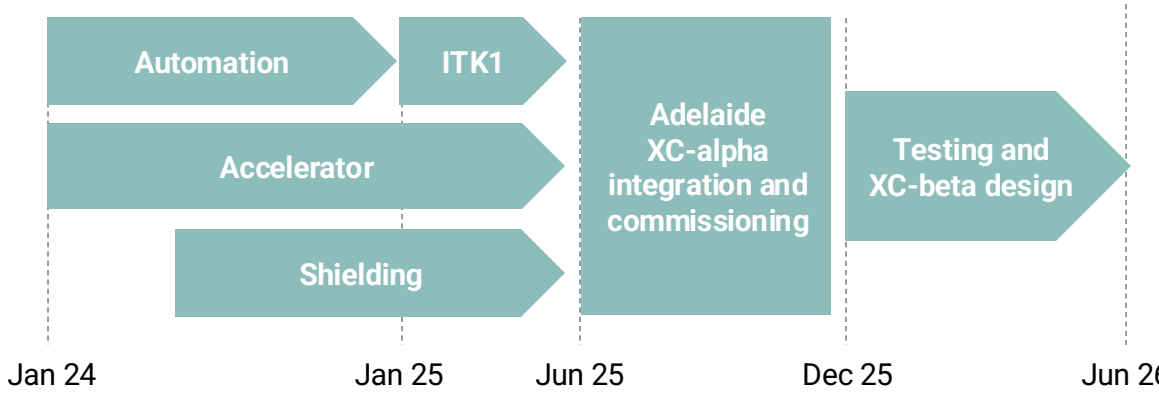
The Aussie contender



Automation redesign undertaken in partnership with Australian companies SAGE and Automation Innovation. High-performance robot executes majority of sample handling, providing flexibility to reprogram operations and add additional analysis stages. Installed as an upgrade to ITK1 unit and operating successfully in Perth since May 2025. Throughput increased to 83-84 jars per hour.

X-ray source (accelerator) developed for Chrysos by the US company Accelerad. Modular design with many key components available 'off the shelf' from commercial vendors. Training provided for Chrysos staff to install and maintain accelerators around the world.

Shielding sees supply chain decoupled from Chinese manufacturers.



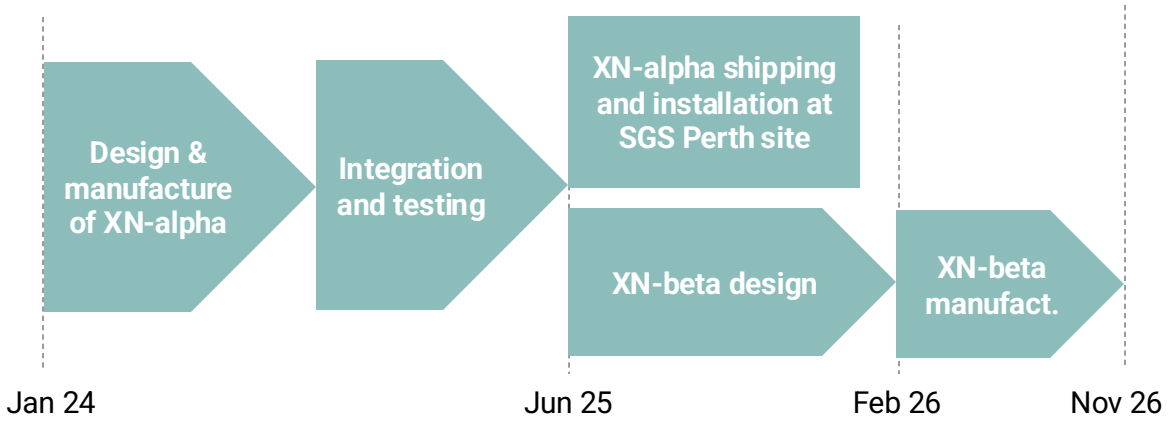
PhotonAssay™ - XN

Continuing the Nuctech partnership

Shared automation design with XC, building on the successful operating experience with the first prototype. Manufacture will be transferred to China for more efficient integration with Nuctech's supply chain.

Cabins have been redesigned to significantly reduce footprint and the required facility height, with the aim of making it easier to find existing buildings to accommodate new units.

Shielding redesigned for easier, faster and safer installation. Splitting accelerator cabin into two parts allows for shipping and onsite setup without removing heavy shielding blocks.



RAFT – Rapid Analysis of Fill & Transmission

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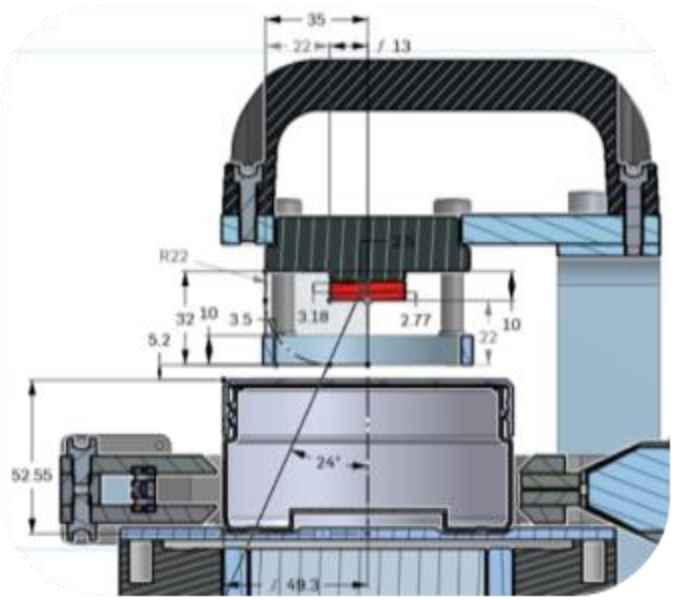
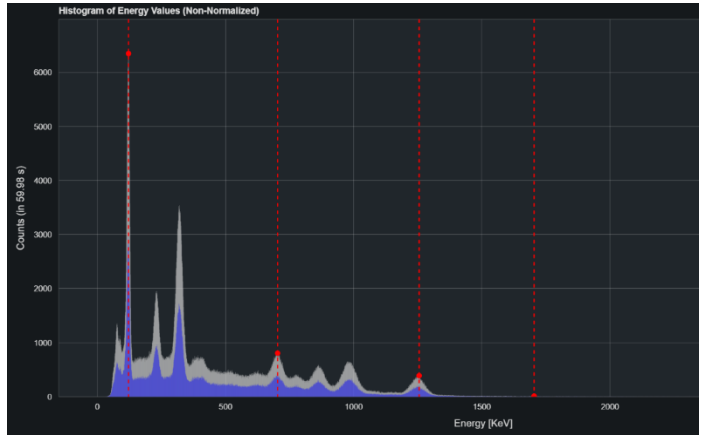
Improving ease-of-use and data quality

FACT

Jar fill level and gamma-ray transmission are important parameters needed for accurate analysis of gold and other elements

- Several parameters, including sample mass, jar fill level and how easily radiation passes through the sample material ('gamma-ray transmission'), are inputs into the calibration algorithm
- The jar fill level is currently measured by the operator using an optical camera system. This requires careful attenuation and can be affected by dusty or dirty jars and particularly light or dark sample materials
- Accurate knowledge of gamma-ray transmission is particularly important for certain elements. This factor currently dominates the analysis precision for silver, for example.
- The RAFT project overcomes both these limitations, determining the jar fill using an X-ray scan and directly measuring radiation absorption using a small radioisotope source
- RAFT will be included as standard in XC and XN units, and has been designed as a retrofittable upgrade for existing Generation 1 units
- Result: easier process for users, 3-4× better jar fill and gamma-ray transmission measurements and more accurate assay results





Broadening the Offering

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Moving beyond gold, silver and copper; making life easier on-site

Doing more with standard PhotonAssay™

- PhotonAssay™ systems were always designed to be inherently software-upgradeable
- Changing the operating conditions of the X-ray source allows a wide range of elements to be excited
- The high-resolution detector system allows emissions from these elements to be distinguished and counted
- Upgrading the analysis software and internal corrections tables allows new elements to be assayed and reported

Modifying PhotonAssay™ for new elements

- Neutron activation analysis (NAA) is a powerful complement to PhotonAssay™
- NAA enables the analysis of many elements that are not accessible to PhotonAssay™
- Analysis can potentially be performed using existing X-ray source and detector systems
- Concepts for a combined PhotonAssay™/NAA system are under development

New assay technologies

- Take advantage on work already done to obtain, label and prepare samples for PhotonAssay™
- Focus on technologies that provide complementary analysis capabilities
- Measurements performed on bulk, minimally prepared samples in existing jars
- Current focus on X-ray fluorescence (XRF) analysis, already widely used and accepted in minerals industry
- Additional technologies planned in the future

Automated sample preparation

- With labour savings realised from elimination of fire-assay, sample preparation is major driver of onsite manpower requirements
- Sample preparation requirements for PhotonAssay™ are a good match for emerging automated technologies

New elements with standard PhotonAssay™

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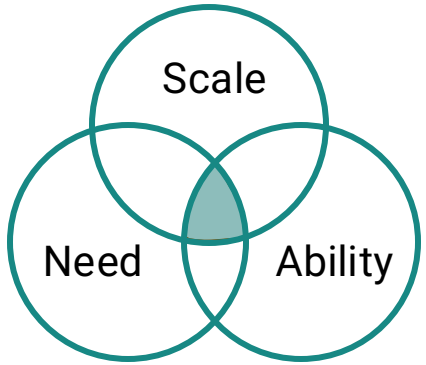
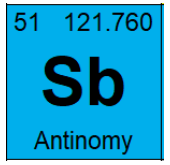
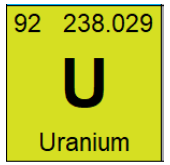
Unlocking further market opportunities

- Measurement via PhotonAssay™ requires an element to have a suitable activation reaction with a short half-life and distinctive emission signature
- About half the elements in the periodic table meet these basic requirements
- Changing the energy and duration of the X-ray activation phase can target specific elements or element combinations
- Two applications under active development are analysis of antimony (Sb) and uranium (U)
- Applications must always meet basic requirements of market scale, industry need and PhotonAssay™ performance







Stibnite, a major ore source of antimony[1]

Uraninite, a significant ore source of uranium[1]

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Neutron analysis using PhotonAssay™ units

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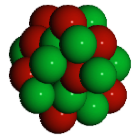
Broadening our element coverage

- **Neutrons** are emitted as a by-product from the X-ray source in a PhotonAssay™ unit
- **Current instrument design** minimises their production, but there are opportunities to modify the source design to rapidly 'tune' neutron production
- **Computer modelling** is being used to optimise instrument design and calculate likely performance for different elements
- **Experimental testing** planned for coming calendar year
- **Applications** to many critical, commodity and penalty elements



FACT

Neutrons are one of the constituents of atomic nuclei, the other being protons. Being uncharged, neutrons penetrate solid samples easily and are well suited to bulk analysis

Critical minerals

- Scandium
- Vanadium
- Manganese
- Antimony

Penalty/deleterious elements

- Fluorine
- Arsenic
- Sulphur

Rock-forming elements

- Silicon
- Aluminium
- Calcium
- Iron etc

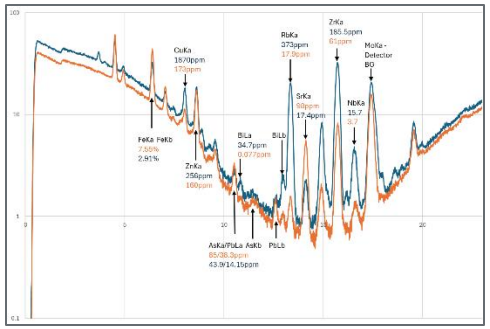
Commodity elements

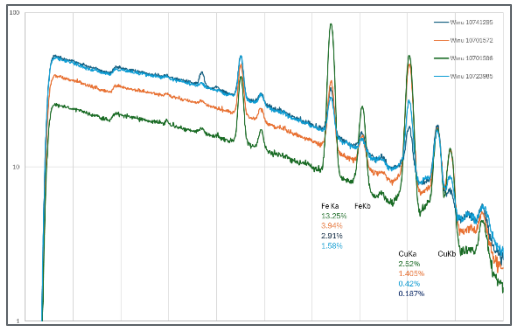
- Aluminium
- Titanium
- Tin
- Rare earths

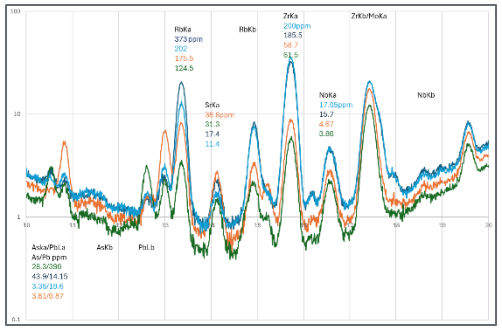
New technologies – X-ray Fluorescence

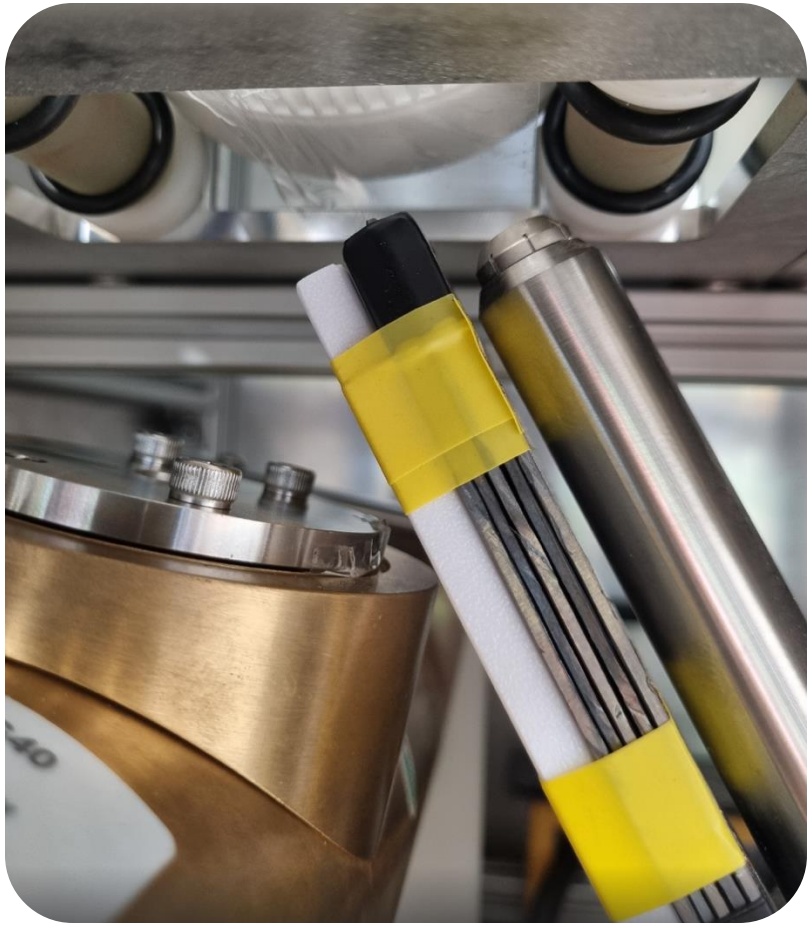
Fast, low-cost supplement to PhotonAssay™

- Widely deployed technology for multi-element analysis
- Accurate, quantitative lab applications require careful and extensive sample preparation – typically fusion – due to significant matrix and particle size effects
- ‘Low-prep’ approaches such as portable XRF (pXRF) typically provide only semi-quantitative data, but there is growing interest in performing semi-automated pXRF as a fast, low-cost adjunct analysis in laboratory settings
- Chrysos is exploring targeted XRF performed directly on samples inside PhotonAssay™ jars. The team has significant R&D experience in on-stream XRF analysis of mineral slurries and similarly ‘unprepared’ materials
- Equipment would be installed inside PhotonAssay™ units and operate in parallel without reducing overall sample throughput or analysis time
- Opportunities to combine PhotonAssay™ and XRF data to improve calibration performance









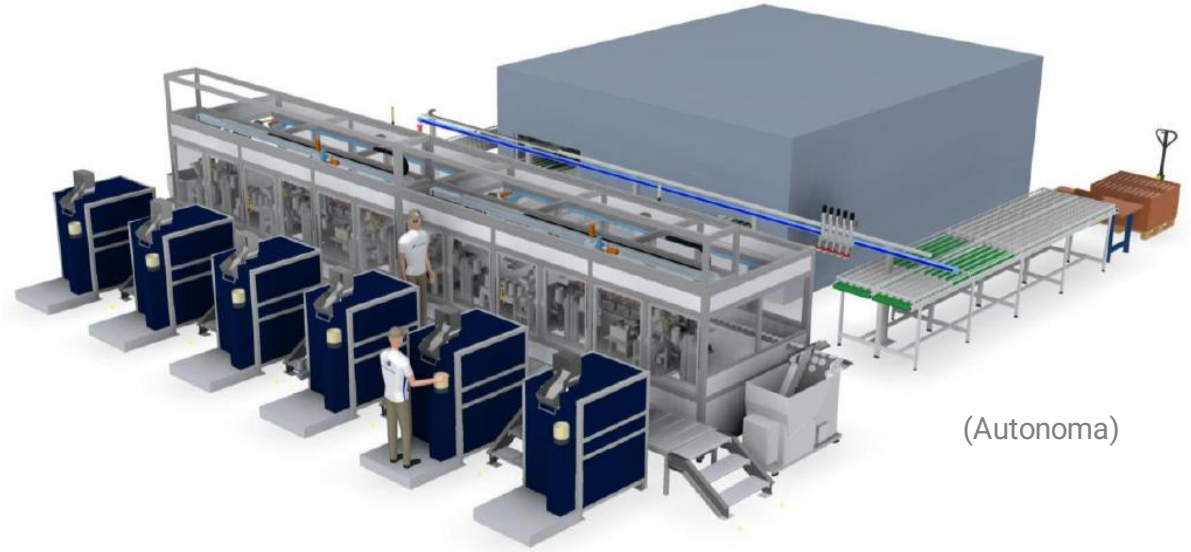
Automated Sample Preparation

Towards a fully automated on-site laboratory

- Several industrial automation specialist providers have developed automated sample preparation solutions specifically targeted at PhotonAssay™
- Typically, these include manual loading of sample bags by operators, followed by automated crushing, splitting, jarring and weighing
- Samples can then be automatically conveyed to PhotonAssay™ unit for analysis and reporting
- Parallel installations are currently planned or underway at client sites in North America and Australia

Action	Fire-assay	PhotonAssay™
Sample receipt	👤👤	👤👤
Sample prep	👤👤👤👤 👤👤👤👤	👤👤👤👤
Assay	👤👤👤👤👤👤	👤👤👤
Lab finish	👤👤👤👤👤👤	
Admin/QC	👤👤👤	👤👤👤

Staffing for lab, 1500 samples/day (manual prep)



(Autonoma)

Long-term IP strength is about momentum, not position

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Thank you

For more information, please visit **chrysoscorp.com**
or contact us at **investors@chrysoscorp.com**

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