Proposal for Procurement of Laboratory Equipment Through NMET Fund for Capacity Augmentation in CMPDIL

सेन्ट्रल माईन प्लानिंग एण्ड डिजाइन इन्स्टीच्यूट लिमिटेड
(कोल इण्डिया लिमिटेड की अनुषंगी कम्पनी / भारत सरकार का एक लोक उपक्रम)
गोन्डवाना प्लेस, कांके रोड, राँची - 834 031, झारखंड (भारत)
Central Mine Planning & Design Institute Limited
(A Subsidiary of Coal India Limited / Govt. of India Public Sector Undertaking)
Gondwana Place, Kanke Road, Ranchi - 834 031, Jharkhand (INDIA)
CORPORATE IDENTITY NUMBER - U14292JH1975GOI001223

APRIL-2024

Background:

MOC vide letter no F.No. 5507/3/2007-CRC-I(Vol-II) (FTS-323159) dt. 21/06/2023 has requested CMPDIL to explore minerals other than Coal/lignite during the course of exploration of Coal/Lignite under Central Sector Scheme/CIL funded activities.

CGPB Committee –V in its meeting in 2018 has also adopted a resolution for analysis of REE & Trace elements of Coal & Associated rock samples during all coal and lignite exploration projects. GSI has already implemented this recommendation in its coal/lignite exploration projects and reports on coal/lignite exploration generated after FS 2019-20 contain REE analysis with few trace element analyses.

In view of above, activities for Baseline Data Generation for Mineral commodities other than Coal have been introduced during Coal Exploration projects executed under CSS funding/CIL funding. In this regard a SoP is created by CMPDIL.

As per the SoP, Borehole Core Samples from boreholes drilled during the coal exploration may be subjected to Geochemical Studied (Major Oxides, REE & Trace Elements). ***1(one) Borehole per 10 sqkm area or minimum one borehole per block (for Coal blocks with area <10 sqkm) may be identified for this purpose & Complete borehole core section from top to bottom of the borehole will be subjected to systematic sampling and Geochemical Studied (Major Oxides, REE & Trace Elements)***. Few borehole core samples may also be subjected to Mineralogical Studies.

The laboratory analysis to be carried out are mainly:

- XRF studies (For Major Oxides)
- XRD studies (Mineralogical Studies)
- ICPMS studies (For REE & Trace Element Studies)
- EPMA/SEM-EDX/EBSD/LA-ICPMS Studies

Further, during review meeting by Secretary Coal on 27/12/2023, in reference to the communication received from PMO, CMPDI was advised to strengthen its capacity for REE & other mineral analyses while exploring for coal.

Existing Capacity of CMPDIL:

Laboratory Services of CMPDIL is a centre for excellence in resource quality evaluation, beneficiation and proper utilization of coal/lignite and minerals. Expert services are offered with highly skilled manpower and state-of-the-art equipment for characterisation of coal and lignite through chemical, petrographic and washability route supported by coal technologist for end use.

The Chemical Lab is equipped with the following testing facilities for sample analysis:

- Coal core logging and sample preparation.
- Band by band analysis (Ash %-Moisture % determination)
- Proximate analysis (Ash %- Moisture %-Volatile Matter %+Fixed Carbon % determination through conventional & Microprocessor based equipment)
- Determination of Gross Calorific Value (GCV(Kcal/kg))
- Ultimate analysis (Carbon %, Hydrogen %, Nitrogen %, Sulphur % & Oxygen %, determination)
- Moisture% at 60% Relative Humidity & 40°C
- Ash Fusion Temperature Range (Initial Deformation Temperature, Spherical Temperature, Hemi Spherical Temperature & Fluid Temperature).
- Hardgrove Grindability Index (HGI)
- Free Swelling Index (FSI), Crucible Swelling Number (CSN)
- Low Temperature Gray King Coke Type (LTGKCT)
- Plastometric test
- Mercury analysis
- Ash analysis through WDXRF
- Mineralogical Study through XRD

Coal Petrography Lab of CMPDI has been accredited by International Committee of Coal and Organic Petrology (ICCP) since 1996. With its highly trained and dedicated manpower and advance sophisticated imported equipment, the Laboratory is in a position to undertake following analysis:

- For Coal & Lignite
    - Maceral Composition Determination

- Vitrinite Reflectance Determination
  - Mean Random Reflectance %(Rr%)
  - Mean Maximum Reflectance %(MMR%)
- V Type Distribution
- Visible Minerals in Coal

- For Oil and Gas Exploration
  - Vitrinite Reflectance
  - Maceral Analysis, Liptinite (Exinite) Fluorescence
  - Maturation Potential
  - Thermal History Studies
- For Oil Shales
  - Maceral Analysis
  - Liptinite (Exinite) Fluorescence
  - Vitrinite Reflectance
- Micro area analysis through Scanning Electron Microscope(SEM)
  - Shape, size of Minerals in Coal.and non coal.
  - Micro Cleat Study in Coal

Proposal:

In view of directives of Ministry of Coal to strengthen of the capacity of CMPDIL for REE & other mineral analyses, this proposal for procurement of various lab equipment through NMET funding has been prepared.

1. Establishment of LA-HR-ICP-MS Facility.
2. Rock Cutting Polishing and Mounting Unit for Thin Section & Polished Section Preparation.
3. Transmitted and Reflected Light Polarizing Research Microscope with Camera, Image Analyses Software & Workstation.

Estimated Price Details are tabulated Below:

Sl no.	Item Description	Qty	Amount (INR) In Lakhs
1.	LA- ICP-MS Facility (Specifications in Annexure-I)	1 unit	310.00
2.	Rock Cutting Polishing and Mounting Unit Both for Thin Section & Polished Section. (Specifications in Annexure-II)	1 Unit	158.00
3.	Transmitted and Reflected Light Polarizing Research Microscope with Camera, Image Analyses Software & Workstation. (Specifications in Annexure-III)	1 Unit	21.00
		Total	**588 (including GST)**

Justification:

CMPDIL being the Nodal agency of Ministry of Coal for Coal exploration. CMPDIL supervise & execute almost 7 lakh meters of exploratory drilling is being carried out annually for coal exploration in the country, covering the vast area of India Coalfields. These facilities will help in characterisation of coalfields sediments/ rocks for any potential mineral enrichment if any.

It is also to mention here that world over coal & associated rocks are proving to be an alternate source for critical minerals.

In addition to above CMPDIL is also venturing in mineral exploration other than coal through NMET funding. These facilities will also help other exploration agencies for timely analyses of samples. that will ultimately result in timely completion of exploration projects.

Enclosures:

1. Annexure-I
2. Annexure-II
3. Annexure-III
4. MoC letter Dt. 21/06/2023

Annexure-I

Technical Specifications: LA

LASER ABLATION- INDUCTIVELY COUPLED PLASMA ANALYZER (LA- ICP-MS)

General requirement:

i. To be utilized for multi-element and isotopic analyses of solid and liquid samples
ii. Important analytical tasks envisaged include:

a) In situ U-Pb dating of zircon and other minerals
b) Pb-Isotope analyses of solid and liquid samples
c) High precision elemental analysis of elements from Li to U including REEs and PGEs
d) Isotope ratio measurements of conventional and unconventional elements

Detailed technical specifications of LA-HR-ICP-MS are given below:

Sl. No.	Parts/Components	Specifications
1	**LASER ABLATION SYSTEM**	**Nd : YAG Solid UV Laser with following features** 12.1 Frequency quintupled Q- switched 213 nm, UV 12.2 Energy density, >30 J/cm^2 on sample surface, fully under computer control 12.3 Flattop laser beam energy profile of craters with high absorption 12.4 Characteristics suitable for analysis of opaque and transparent minerals. 12.5 Laser Pulse width:<5ns. 12.6 Repetition Rate: 1-20Hz. 12.7 Optical imaging control system with digital camera (upto 60X zooming). 12.8 Built in laser energy measurement system 12.9 8X, UV achromatic objective lens Variable spot size aperture system: spots 3-110 µm with extended range up to 250 µm 12.10 Low volume laser chamber with provision to accept thin sections, more than 3 one-inch dia. Resin Stubs. 12.11 Large format ablation cell to hold at least five 1"diameter resin stubs 12.12 Stage movement resolution: µm or less inlets for He and Ar gases along with on line gold trap 12.13 Integrated control PC and software featuring auto-focus and sample image import capability

In addition to above CMPDIL is also venturing in mineral exploration other than coal through NMET funding. These facilities will also help other exploration agencies for timely analyses of samples, that will ultimately result in timely completion of exploration projects.

Enclosures:

1. Annexure-I
2. Annexure-II
3. Annexure-III
4. MoC letter Dt. 21/06/2023

Annexure-I

2	Software (For LA system)	13.1 The software should provide fully-integrated operation of the instrument and sample inlet system. 13.2 The software should be able to read output values and all-important paraments involved in the operations. 13.3 The system must include laser ablation software program with auto sampling functions. 13.4 Software should have built-in safety warnings features for safe operation and maintenance. 13.5 Software for remote handling and online servicing/remote diagnostics (form customer support of the manufacturer) of the instrument must be provided. 13.6 The software & interface must be able to connect the LA to Q-ICPMS/HR-ICPMS/MC-ICPMS. 13.7 All future software upgrades must be provided free of cost. 13.8 The software must include the sample cell map and ability to build the whole sample's mosaic. 13.9 The software should have the ability to import wide range of image files. 13.10 The system must also include software package for automated elemental imaging. 13.11 The software should accept all major ICPMS file formats. 13.12 Software also should be able to handle large data points for 2D, 3D or RGB multi-composite images. 13.13 Latest version of data reduction and processing software (IOLITE) should be included within the given price.
3	Spares and consumables	14.1 Complete list of consumables and spares that comes as standard supply with the Laser should be provided within the given price.
4	Training	15.1 Comprehensive hands-on onsite training (10 working days) for laboratory personnel in preventive maintenance, operations and application software of the HR-ICPMS and 213 nm laser after installation must be provided by an expert engineer at free of cost. 15.2 One-week advance training on application aspects, maintenance, troubleshooting, etc. for 3 persons at the principal's factory/application lab/training center without any additional cost. 15.3 Two on-site training per year till 5-year warranty should be provided at Consignee site covering an operational aspect of the instrument, maintenance, usage of software for sample analysis, and advanced applications without any additional cost.
5	Manuals and circuit diagrams	16.1 A complete set of operation and maintenance modules, covering instrument and software operation, instrument maintenance and fault diagnostics should be provided in hard copy as well as in CD/softcopy along with the HR-ICPMS and LA system.
6	Installation, warranty and maintenance and customs clearance	17.1 Installation at the site must be free of cost. 17.2 All the standard solutions and solid/minerals for the specification test should be supplied by the vendor. 17.3 Five years full comprehensive warranty within the given price for the HR-ICPMS and LA system and their subsystems including spares and consumables, support subsystems and the computer systems from the date of satisfactory installation and acceptance of installation. 17.4 It should include a minimum of 02 preventive visits per year and unlimited breakdown calls. 17.5 The response should be within 48 hours after lodging a warranty call for troubleshooting.

		17.6 Instrument downtime should not be more than five days in normal circumstances. In case of a spare part breakdown/malfunction, the part should be replaced within a month. In case of delay, extra downtime should be added to the warranty period. 17.7 Annual service and maintenance visits by the engineers (at the vendors cost) must be provided within the warranty period. 17.8 Customs clearance and delivery (including insurance) is to be met by the vendor. 17.9 Vendor should visit the site and providedetails of pre-installationrequirements for the instrument. 17.10 Sample preparation lab as per NABL requirement, its components (tables with drawers, required glassware, Micropipette set with tips (for 10000 samples), tip box (2 unit of each size) and Micropipette stand as per requirement) and the entire preparation, fabrication, electrical (including air conditioners etc) is the responsibility of the vendor.
18	Supply of standards/ reference materials/ tool kits	18.1 A full kit that includes all the necessary tools for the installation and maintenance of the HR-ICPMS & LA system for 5 years should be provided. 18.2 In addition to the standards/reference materials necessary for installation and testing, the following standards should be provided. 18.2.1 USGS (USA) standards (AGV-2, BCR-2, BHVO-2, BIR-1a, CLB-1, COQ-1, DNC-1a, DGPM-1, DTS-2b, GSP-2, NOD-A1, NOD-P1, RGM-2, SBC-1, SCo-1, SDC-1, STM-2, W-2a) 18.2.2 GSJ (Japan) standards (JA-1a, JA-2, JB-2, JG-1a, JG-2, JGb-1, JGb-2, JLs-1, JDo-1, JCFA-1) 18.2.3 CANMET (Canada) standards (SY-2, SY-3, TDB-1, WGB-1, WMG-1a, WMS-1a, WPR-1a) 18.2.4 SARM (South Africa) standards (SARM-7, SARM-39, SARM-40) 18.2.5 Sr: SRM 987 18.2.6 Ca, Pb, Zr, Si, U, Tl standards 18.2.7 91500 Zircon, GJ1 Zircon, Plesovice Zircon, TEMORA Zircon 18.2.8 SRM NIST 610, 612, 614, 616 glass standards 18.2.9 SRM NIST 1640A, 1643E water standards 18.2.10 Tuning and optimisation solutions 18.2.11 Certified multi-element solutions
19	Other items (within quoted price)	19.1 UPS: 50 KVA three-phase UPS, from reliable and reputed bands/manufacturers with automatic correction for phase reversal and 1-hour backup and power out as per instrument requirement. Five years warranty for UPS should be provided. 19.2 Refrigerator: 02 no. Double Door 4°C Refrigerator with Adaptive intelligence technology (Steel Onyx, Convertible), Capacity - 500 Litres, Warranty – 5-year warranty on the product and 10 years on the compressor. 19.3 Licenced version of the data reduction software (latest version of Iolite or Glitter) should be provided for 5 years.
20	Other requirements	20.1 Quotation should include complete sets of spares and consumables (other than standard supply) for 10000 samples for HR-ICPMS & LA system. 20.2 If any other items/features not covered in the above specifications and are likely to be required for the operation and maintenance of HR-ICPMS and LA-system must be quoted along with the supporting literature.

21	Other conditions	21.1 Comprehensive guidelines and requisites for the development of pre-installation infrastructures including requirement of air conditioning, UPS etc with specifications should be provided. Availability of telephone support, including telephone numbers and email addresses, must be detailed. The information must allow contact to be made during bid evaluation, in order to evaluate the length of time and quality of response to technical and procedure questions. 21.2 Supplier must provide a full specification of performance, including both internal and external precision in measurements of HR-ICPMS & LA system. 21.3 Various performance parameters of both HR-ICPMS & LA systems according to those mentioned in the brochures or on the company's website and/or quoted must be demonstrated during installation. 21.4 Name with full credentials and experience of the factory-trained service engineers currently on role in India and place of normal residency must be submitted in the offered quotation. 21.5 List of earth science laboratories in India and/or abroad must be provided with contact details of the person-in-charge, model and date of installation of similar models.
22	Other Necessary Lab Requirements (Within the quoted price)	01 unit Microweighing balance : 6.1 g capacity; 0.5 µg readability or better with vibration free table. 02 unit Branded Dehumidifier, Branded 04 unit metallic Almirah, 02 unit Metallic glass bookshelves, 01 unit Open rack for chemical storage

Specification for ICP-MS

ThermoFisher SCIENTIFIC

Trace elemental analysis

Power through your complexity

Removing the challenges of complex sample analysis

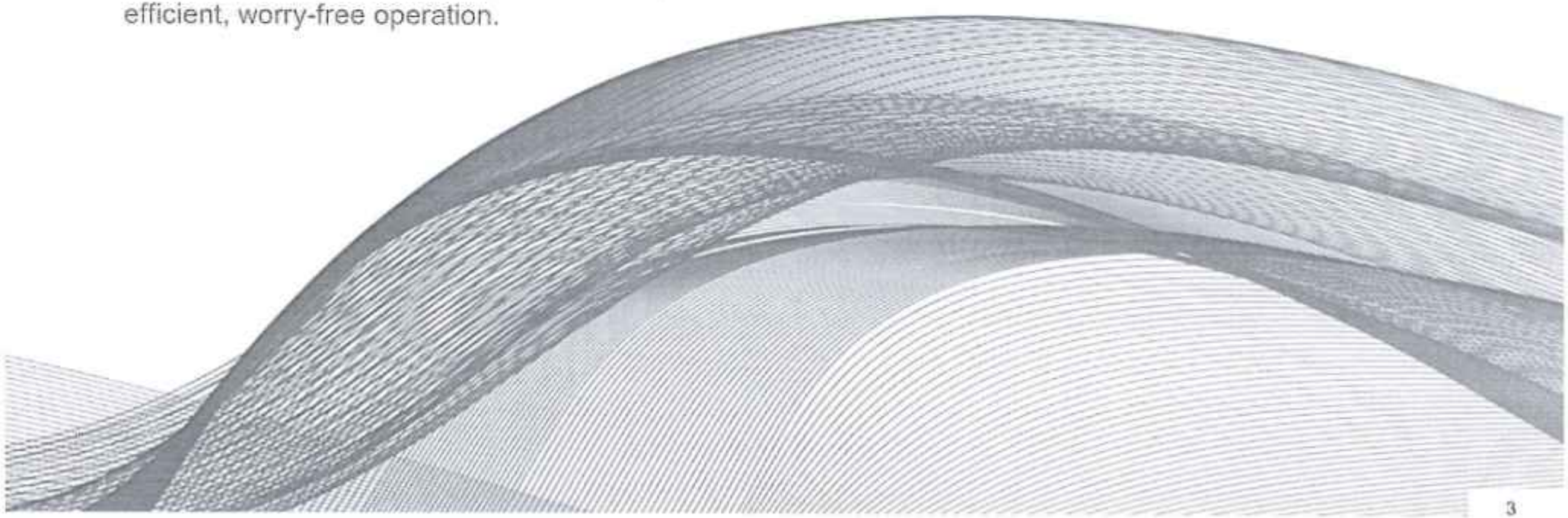
Thermo Scientific iCAP RQplus ICP-MS


thermoscientific

Reliable, robust trace elemental analysis of complex samples

Laboratories that face the challenge of analyzing trace elements in complex and diverse matrix samples need a solution that delivers results quickly, with minimum maintenance and labor costs.

The Thermo Scientific™ iCAP™ RQplus ICP-MS provides the operational simplicity, robustness, and stability required to enable long-term daily analysis of varying matrices without drift, QC failures, or the need to re-run samples. Active monitoring of instrument performance and consumables takes the guesswork out of maintenance, and further assures reliable, efficient, worry-free operation.



Power through your complexity

Simplify your workflow

Flexible software with an intuitive interface is essential for high-throughput laboratories. Thermo Scientific™ Qtegra™ Intelligent Scientific Data Solution™ (ISDS) Software provides simplified user experience via clearly structured method creation and user-configurable templates, easily interpretable data display, and comprehensive results reporting.

Power through challenging samples

With three pre-set, next generation, self-optimizing online Argon Gas Dilution (AGD) modes, any sample type, starting from food digests and drug products, up to high matrix samples like soil digests and saline waters, can be measured immediately without prior manual dilution. Carryover and cross-contamination are minimized by the intelligent design of the sample introduction system components. The resulting time savings is a game changer for the modern elemental laboratory running a wide variety of sample matrices.

Automate reliable performance

Validating instrument performance prior to analysis is vital for smooth daily operations. With the iCAP RQplus ICP-MS, the one-click Get Ready feature automatically checks performance and highlights any areas that need attention before analysis begins.

Comparing day-to-day performance over time helps track trends, pre-emptively identifies maintenance needs, avoids unplanned downtime, and aids audit preparation.

Petrochemical

Industrial

Clinical and toxicology

Food safety

Pharmaceutical

Environmental


thermo scientific

Reducing complexity with iCAP RQplus ICP-MS technology

Robust sample handling that meets regulatory demands

Low, medium, and high argon gas dilution (AGD) modes with set dilution factor configurations easily handle every type of sample. Dependable and predictable performance is ensured through pre-defined automatic parameter optimization for each AGD mode, enabling you to achieve exceptional long-term analysis stability.

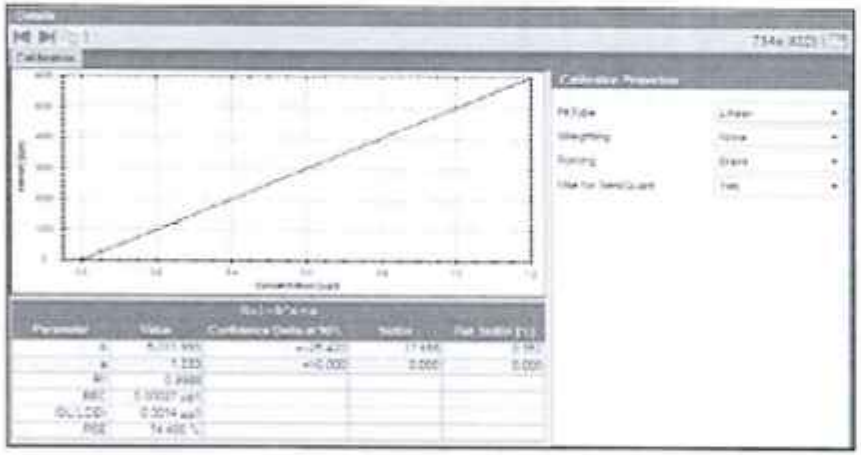


Figure 1. Arsenic Calibration Table with IDL

Efficiently managed uptime

Improve throughput by analyzing across the entire mass range in a single mode (Helium KED) without switching instrument conditions.

Automatic instrument monitoring with alerts keeps you running efficiently.

Quickly compare day-to-day instrument performance and track trends over time.

Maintain productivity and avoid unplanned downtime with Thermo Scientific™ Hawk™ Consumables and Maintenance Assistant.

Advanced accessory handling and novel applications

Fully integrated Qtegra ISDS Software plug-ins provide straightforward operation of the new Thermo Scientific™ iSC-65 Autosampler and other industry-standard autosamplers, autodilution, and rapid sample introduction systems.

Perform speciation, material characterization, and novel emerging applications with fully compatible accessories for chromatography, laser ablation, or single cell analysis.

Figure 2: Dashboard - RQplus ICP-MS with ISC-65 Autosampler

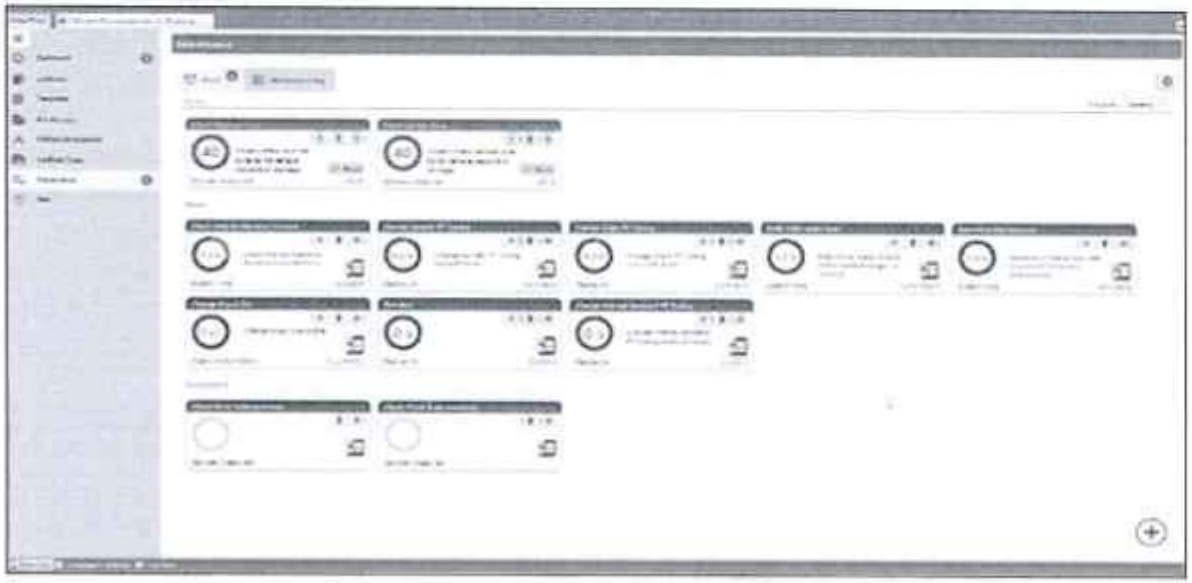


Figure 3: Hawk Consumables and Maintenance Assistant

Reducing complexity with iCAP RQplus ICP-MS technology

Simplified set up and operation, with accurate, right-first-time results

Having a correctly optimized ICP-MS is essential for ensuring performance that meets laboratory defined or external regulatory specifications. The iCAP RQplus ICP-MS is configured to support robust, reliable performance using simplified sample introduction hardware and system performance monitoring.

Key features and benefits

Quick, error-free sample introduction system with unique, automatically tensioned peristaltic pump. Take the guesswork out of pump tensioning and eliminate sample introduction variability.

Trouble-free operation using a quick-connect torch and injector, with automatically aligned gas connections.

Fast cone cleaning with easy-access interface door.

Maximum sensitivity and optimized polyatomic interference removal using QCell technology with helium cell gas and kinetic energy discrimination.

No user maintenance required downstream of the interface cones.

Figure 4. Quick-connect torch and injector

Figure 5. EasyClick Compact (ECC) Peristaltic Pump

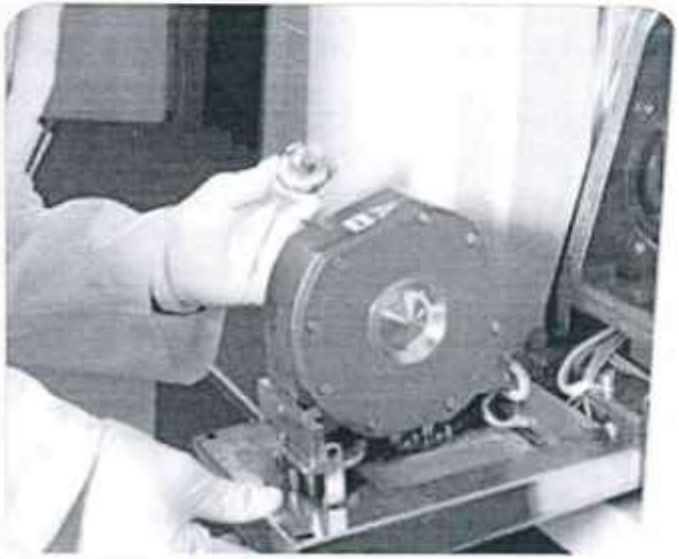


Figure 6. Easy Access Interface Door

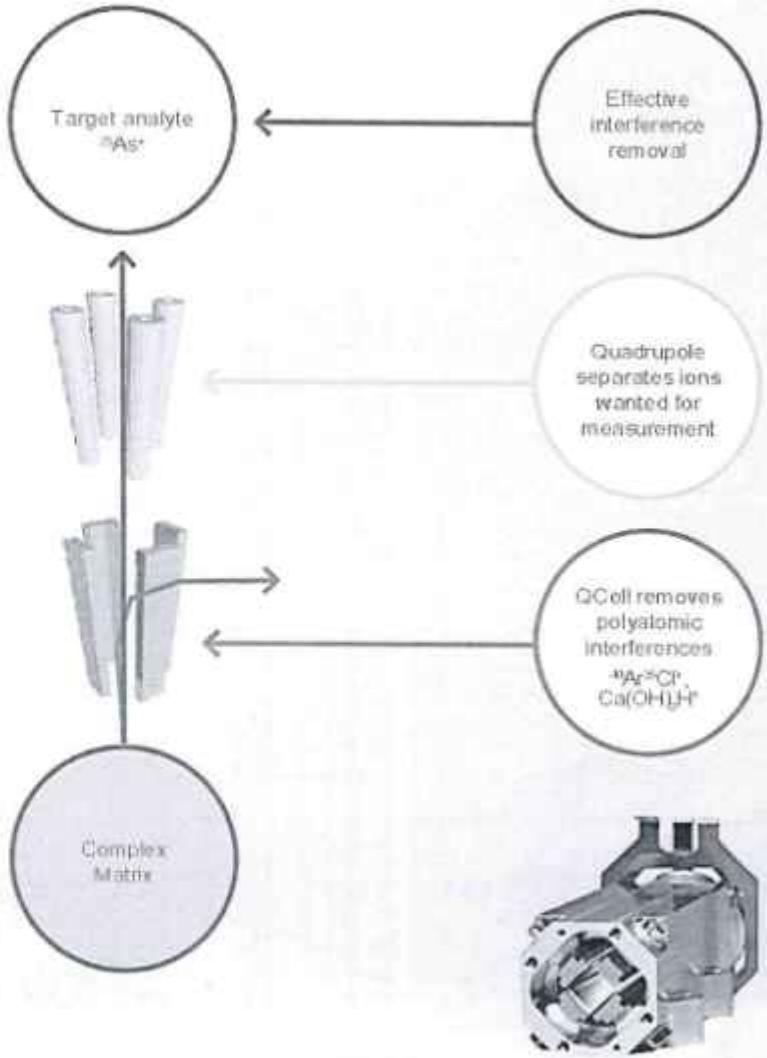


Figure 7. Advanced QCell interference removal technology

Qtegra Intelligent Scientific Data Solution (ISDS) Software

Workflow-structured software for optimized productivity

- Simple, intuitive, template-based workflow for easy implementation in your applied analytical laboratory.
- System DASHBOARD presents critical instrument status information in one clear view.
- Intelligent uptake and rinse functionality combined with unique Step Ahead technology optimizes throughput and eliminates carryover between samples.
- Fully integrated prescriptive and intelligent autodilution capabilities with industry leading accessories.
- Powerful options are available for laser ablation, chromatographic speciation, and single cell analysis.
- GET READY: fully automated, data driven startup process optimizes startup times and ensures consistent performance.

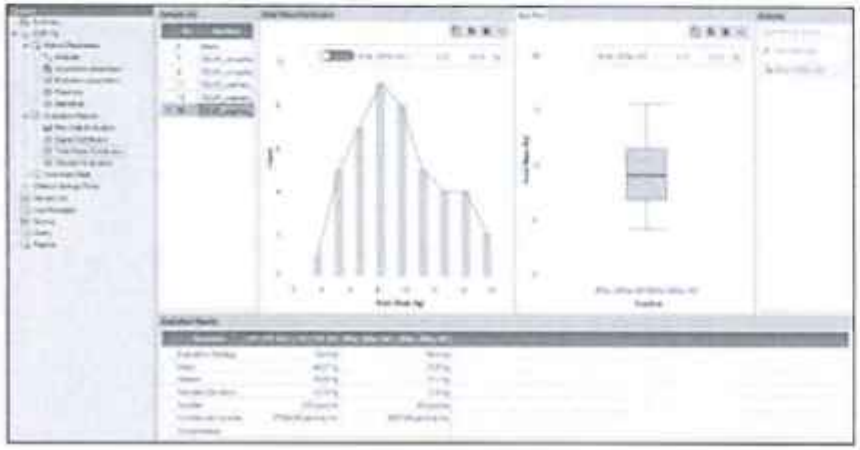


Figure 8. Single cell analysis with Qtegra ISDS Software

Intelligent data assessment

- Integrated, flexible QA/QC functionality ensures compliance with laboratory protocols such as ongoing calibration verifications, internal standard drift, and duplicate samples.
- User definable, analysis-specific limits and intuitive color-coding aid data visualization and highlight outlying data points, such as results higher than the calibration range.

Data and report management

Automated report generation and export features, including full LIMS compatibility, make data management effortless. Customize report formats to fit with the needs of the laboratory or your customers.

Compliance support

Compliance with regulatory requirements such as 21 CFR Part 11 is easily achieved within Qtegra ISDS Software via tools such as audit trailing, administrator / user access rights, and locked methods.

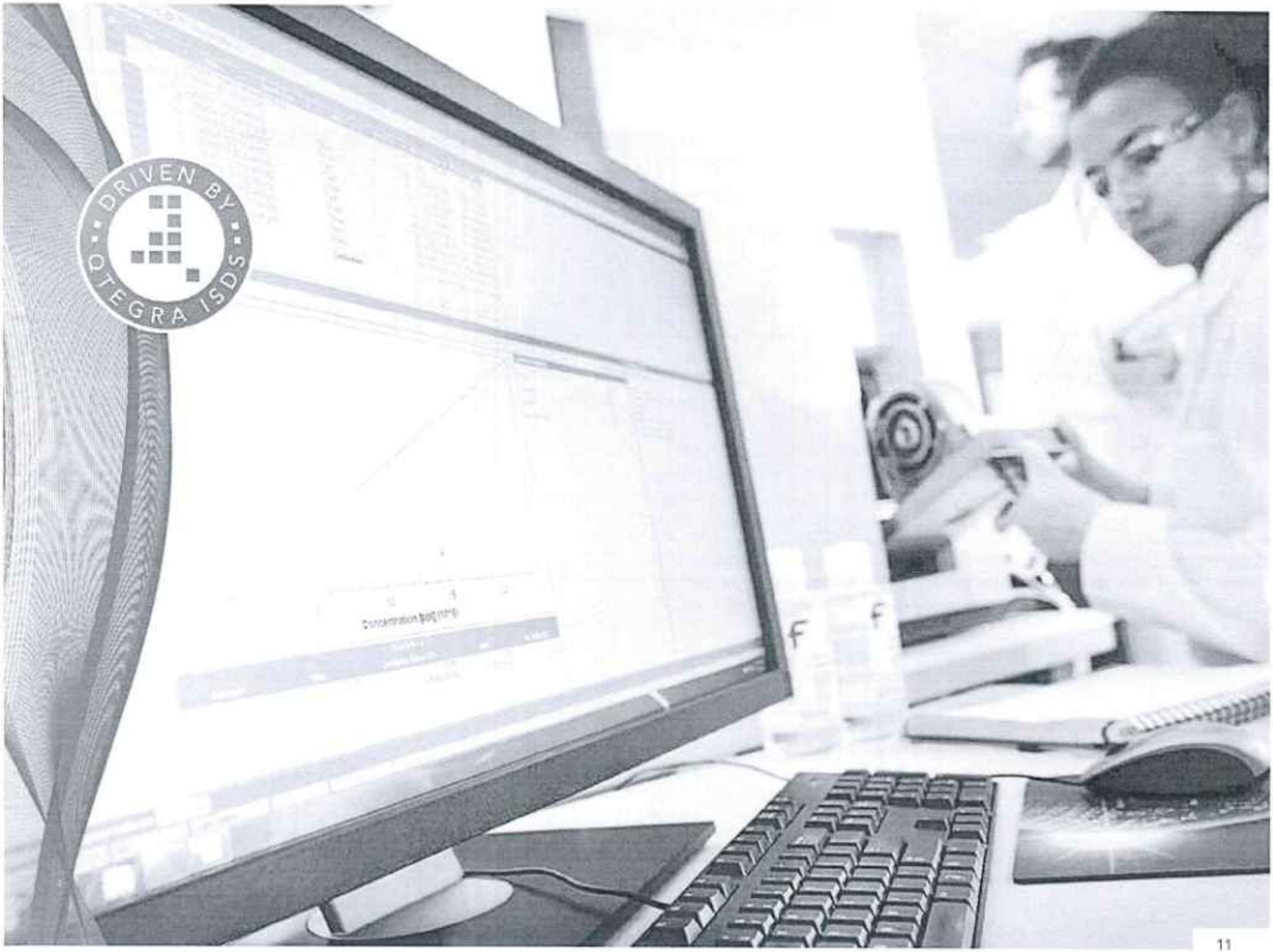
EPA, FDA, and ICH regulatory compliance and audit support

Data security and access control

Compliance management tools

Advanced reporting capability

The Qtegra ISDS Software platform is common across our ICP portfolio, which reduces training requirements and enables operators to switch easily between instruments.


DRIVEN BY
QTEGRA ISDS

Industries

With operational simplicity and reliable long-term performance at the core of the iCAP RQplus ICP-MS, a wide range of applications are accessible, covering multiple markets such as clinical research, pharmaceutical compliance, geosciences, petrochemical, and academic research.

Environmental

Measure both trace and major analytes in recurrent and challenging samples with confidence. Optimize productivity and accuracy for your elemental analysis using pre-defined AGD sample dilution modes and trusted He KED collision cell interference removal. With integrated QC checks, automatic self-assessment of the analysis performance with corrective actions can be easily implemented. Whether you are monitoring drinking water, wastewater, or soil digests, the high-throughput iCAP RQplus ICP-MS meets the demands of environmental analysis methods such as U.S. EPA 200.8, U.S. EPA 6020A, and the European ISO/DIN methods.

Food safety

Rapid and robust, simultaneous measurement of toxic and essential elements for food quality and safety confirmation is routinely achievable with the iCAP RQplus ICP-MS. A full set of integrated QC features ensures compliance with the requirements of food safety legislation and regulations. Extend your applied analytical laboratory capabilities by coupling ion chromatography (IC) or high-performance liquid chromatography (HPLC) with the iCAP RQplus ICP-MS to speciate critical elements such as chromium, arsenic, and mercury in food materials.

Industrial

Whether you are running low-level alloy QA/QC analysis or qualifying advanced materials in the battery, clean energy, and metallurgy industries, the iCAP RQplus ICP-MS can be easily configured to meet your analysis needs. Reliable and robust plasma generation enables you to obtain quality results from complex, variable matrix samples, including organic materials such as petroleum, kerosene, and organic solvents. With the QCell interference removal system, accurate and precise results are assured, even in complex matrix samples.

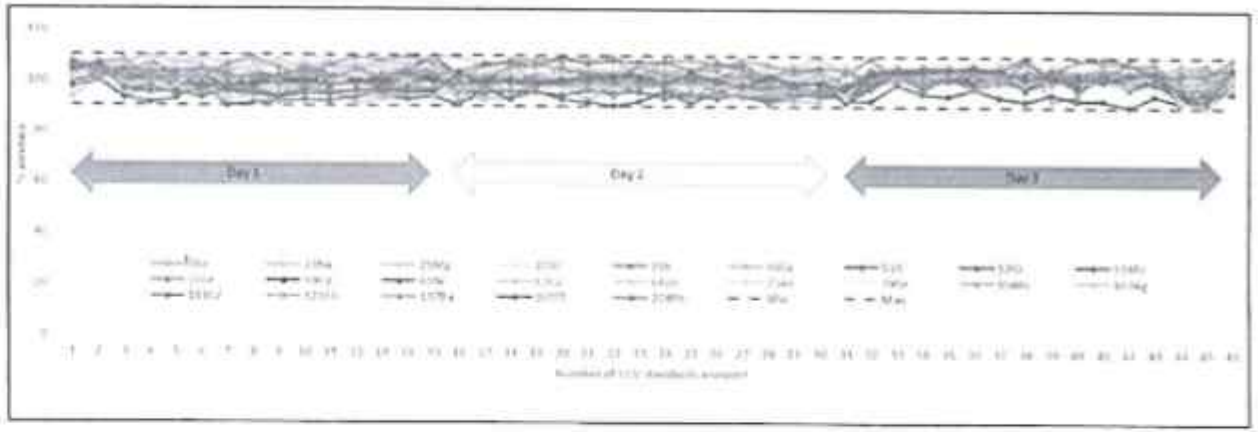


Figure 9. Percent accuracy of CCV standard analyzed over three consecutive days, EPA 6020B (SW-846)

Figure 10. Color coded sample results, 6020B

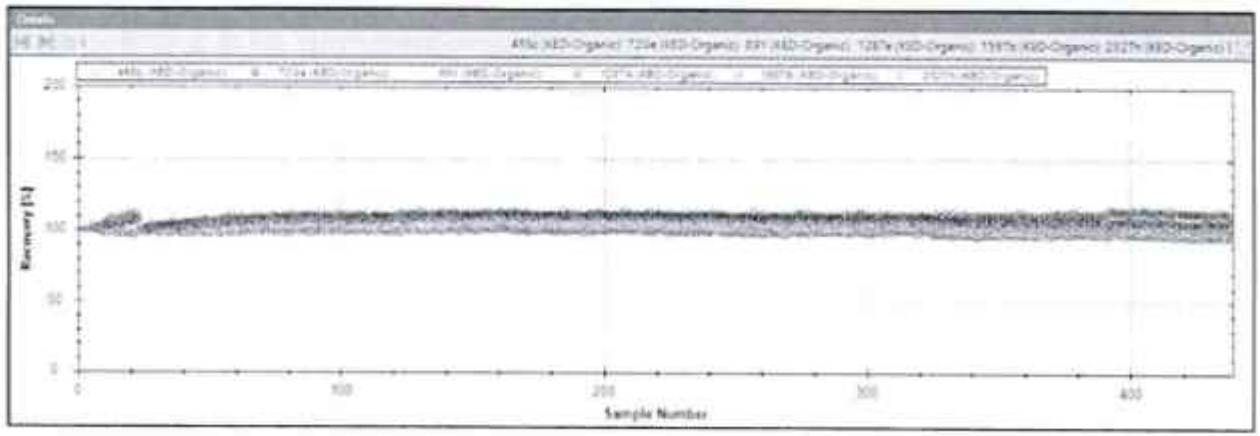


Figure 11. Signal stability of internal standards during the continuous analysis of acetonitrile over 28 hours

Annexure

Email **SOURABH SINGH**

RE: Rquest for Budgetory Offer

From : rajkishorsahani@aimil.com Tue, Mar 12, 2024 01:05 PM

Subject : RE: Rquest for Budgetory Offer 9 attachments

To : SOURABH SINGH <sourabh.singh@coalindia.in>

Cc : RAGAWENDRA PRATAP SINGH <singh.rp@coalindia.in>, PRIYANKAR UPADHYAY <priyankar.upadhyay@coalindia.in>

Dear Sir,

We thankfully acknowledge the receipt of your valuable enquiry. We offer comprehensive solution for sample preparation (Thin Section and Bulk Specimen) for petrography & minerography study from our principals M/s. Struers Aps,Denmark .

Mineralogy and thin sectioning insight | Struers.com

The solutions we offer meets all the following requirements-

Annexure

Email

SOURABH SINGH

RE: Rquest for Budgetory Offer

From : rajkishorsahani@aimil.com

Tue, Mar 12, 2024 01:05 PM

Subject : RE: Rquest for Budgetory Offer

9 attachments

To : SOURABH SINGH <sourabh.singh@coalindia.in>

Cc : RAGAWENDRA PRATAP SINGH <singh.rp@coalindia.in>, PRIYANKAR UPADHYAY <priyankar.upadhyay@coalindia.in>

Dear Sir,

We thankfully acknowledge the receipt of your valuable enquiry. We offer comprehensive solution for sample preparation (Thin Section and Bulk Specimen) for petrography & minerography study from our principals M/s. Struers Aps,Denmark .

Mineralogy and thin sectioning insight | Struers.com

The solutions we offer meets all the following requirements-

SPECIMEN TYPES

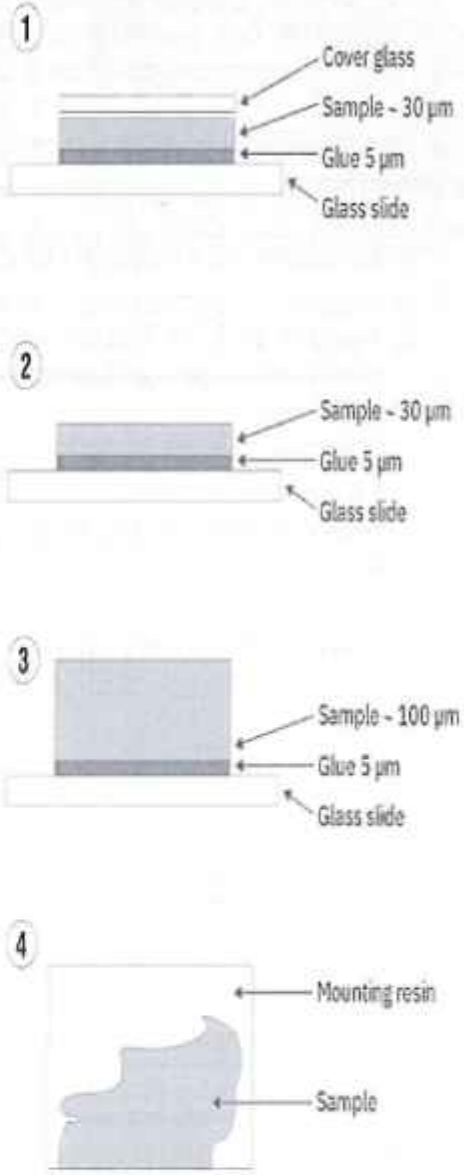
Specimen types can be split into four groups:

1. Thin Sections (30µm) (+ cover glass) - for examination in transmitted light or electron microscope/probe
2. Polished Thin sections - for examination in transmitted/ reflected light or electron microscope/probe
3. Thick Sections (~100µm) - for examination in reflected light or electron microscope/probe
4. Polished blocks/mounts - for examination in reflected light or electron microscope/probe

Specimen types 1)+2)+3) all have "special requirements" from a materialographic point of view. Differences between the three types are characterized by surface finish and specimen thickness.

Specimen type 4 is a more conventional materialographic specimen in terms of requirements.

The same mineralogical material will have similar preparation methods across the four different specimen types, as the material characteristics are decisive for all the preparation steps.



We've long experience of supply, installation, demonstration, training and handover of the complete mineralogical sample preparation lab .

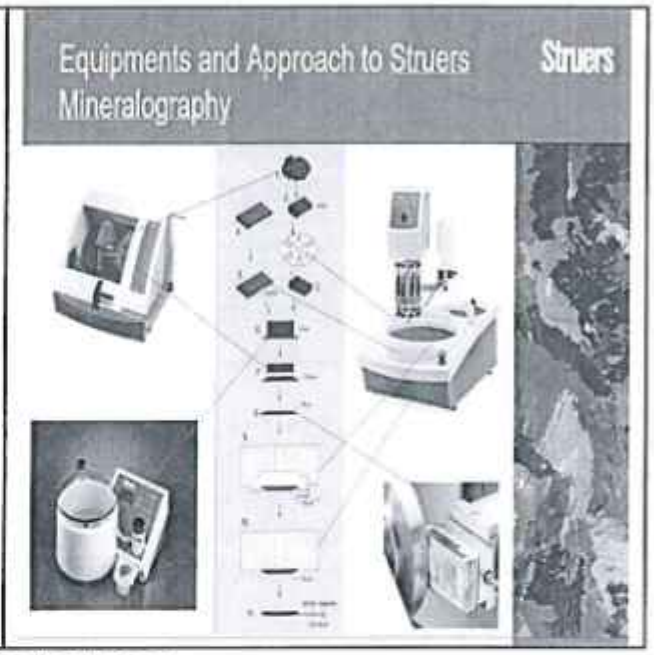
Followings are few users of Struers Mineralogical Solutions-

- 1. CSIR-NATIONAL GEOPHYSICAL RESEARCH INSTITUTE , HYDERABAD
- 2. IISER KOLKATA
- 3. IISC BANGALORE
- 4. CSIR- CENTRAL BUILDING RESEARCH INSTITUTE , ROORKE
- 5. KURUKSHETRA UNIVERSITY
- 6. JADAVPUR UNIVERSITY

- 7. NMDC NAGARNAR
- 8. Pt RAVI SHANKAR SHUKLA UNIVERSITY RAIPUR
- 9. NISER, BHUBANESWAR
- 10. COE, OIL ENERGY CENTRE GUWAHATI

The comprehensive offer will include following 4 major equipments and their accessories plus consumables

1. Labotom-5 Cutting Machine
2. Accutom-100 Automatic Grinding and Re-Sectioning Machine
3. LaboPol-30 / LaboForce-Mi Semi-Automatic Lapping/ Polishing Machine
4. CitoVac Vacuum impregnation , mounting and Gluing Machine



We shall submit our techno-commercial offer very soon.

Thanking you and assuring you of our best attention and services at all times.

With warm regards,

Rajkishor Sahani
Team Member, Material Testing and Metallurgy Div.
off: +91 33 40846414 / mob: +91 98360 45800
e-mail: rajkishorsahani@aimil.com
web: www.aimil.com

Aimil

Aimil Ltd., Shrachi Tower, 6th Floor, C & D Block, 686 Anandapur E.M. Bypass (Near Ruby General Hospital), Kolkata - 700 107, INDIA.

From: SOURABH SINGH <sourabh.singh@coalindia.in>
Sent: Tuesday, March 12, 2024 11:19 AM
To: Rajkishor Sahani <rajkishorsahani@aimil.com>
Cc: RAGAWENDRA PRATAP SINGH <singh.rp@coalindia.in>; PRIYANKAR UPADHYAY <priyankar.upadhyay@coalindia.in>
Subject: Rquest for Budgetory Offer

Sir,

CMPDI, or Central Mine Planning & Design Institute Limited, is a public sector undertaking (PSU) under the Ministry of Coal, Government of India.

We have our Headquarter at Ranchi, Jharkhand. CMPDI is a leading consultancy and Exploration services provider in the field of coal and mineral sector.

We are in processes of setting up a petrography & minerography study lab at Ranchi. For this purpose we need a complete set-up for preparation of thin section and polished section, starting from cutting, grinding, polishing to mounting.

From market survey it came to our knowledge that your company is a leading supplier of instruments required for above preparation.

In this regard, we are interested in requesting a budgetary quote from your company for following :

1. Equipment required for above mentioned preparation ; Equipment wise price & detailed technical specification required
2. CAMC for three years including supply of required consumables required for the operation.
3. Complete Lab Setup (we will provide space for lab), Details may be provided

We look forward to hearing from you soon.

From : SOURABH SINGH <sourabh.singh@coalindia.in> Tue, Mar 12, 2024 11:18 AM

Subject : Rquest for Budgetory Offer

To : rajkishorsahani@aimil.com

Cc : RAGAWENDRA PRATAP SINGH <singh.rp@coalindia.in>, PRIYANKAR UPADHYAY <priyankar.upadhyay@coalindia.in>

Sir,

CMPDI, or Central Mine Planning & Design Institute Limited, is a public sector undertaking (PSU) under the Ministry of Coal, Government of India.

We have our Headquarter at Ranchi, Jharkhand. CMPDI is a leading consultancy and Exploration services provider in the field of coal and mineral sector.

We are in processes of setting up a petrography & minerography study lab at Ranchi. For this purpose we need a complete set-up for preparation of thin section and polished section, starting from cutting, grinding, polishing to mounting.

From market survey it came to our knowledge that your company is a leading supplier of instruments required for above preparation.

In this regard, we are interested in requesting a budgetary quote from your company for following :

1. Equipment required for above mentioned preparation ; Equipment wise price & detailed technical specification required
2. CAMC for three years including supply of required consumables required for the operation.
3. Complete Lab Setup (we will provide space for lab), Details may be provided

We look forward to hearing from you soon.

Annexure-III

Specification for Research Polarizing Microscope with attached Drawing Tube Attachment

Sr. no.	Frame	Specification
1.	Body	Polarizing microscope with transmitted and reflected light illumination system with intensity control and constant colour intensity that provide the same actual colour impression whenever changing the light intensity or objective for long working hours.
2.	Contrast and Illumination	For reflected light: Bright-field, Dark-field, Pol & DIC and should have LED illumination. For Transmitted light: Bright field and Pol should have LED illumination.
3	Reflected light filter turret/ Illumination	Reflected light illumination with LED lamp house for bright field, Dark filed and DIC or Aperture and field diaphragm discs, with 4-5 fold turret for reflector and cubes.
4.	Observation Tube	Trinocular photo tube with viewing ergonomic angle about 5°-30°, field of view ~22 mm or more, variable beam splitters, beam splitter positions: 100% eyepieces, 100% documentation port, and an intermediate distribution.
5.	Nosepiece	5-6 fold nose pieces (coded)
6.	Stage	Top grade rectangular ceramic coated, 360° rotatable polarizing stage with XY Mechanical Stage should be suitable for different slide formats. Engraved stage calibration in 1° increments. Vernier's on two sides to 0.1°
7.	Focus drive	Focus drive should have moving range about 25 - 50mm. Manual Z drive with focusing drive knob for coarse and fine movements.
8.	Eyepiece	10x Pair with graticule with crossline 10 x10mm 1.0mm division.
9.	Objective	High resolution and long working distance objective 2x/ or better High resolution and free working distance objective 5X/0.15 NA or better High resolution and long working distance objective 10x/0.30 NA or better. Long working distance objective 20 x/0.40 NA or better with working distance of about 10 mm or more. Long working distance objective 50 x/0.50 NA or better with working distance of about 8 mm or more. Long working distance objective 100x/0.75 or better with working distance of 3 mm or more.
10.	Filters	Yellow filter–contrast filter for observation of polished surface of grains, etched surface crack and nuclear tracks.
11.	Graticule	Graticule crossline 10mm=100 div., about 26mm (2 pieces) One additional scale of 10 division (10 micrometre) for thin section studies
12.	Stage micro meter	1mm = 100 div
13	Intermediate tube attachment	Intermediate tube, Bertrand lens attachment for orthoscopic and Conoscopic observation
14	Compensator	a) Lambda (Gypsum/Senarmont) Plate b) Quarter Lambda (lambda) Plate
15	Condenser	Strain free Polarizing condenser 0.85 with 360-degree rotatable polarizer with swing out achromat top lens.

Annexure-III

16	Polarizer/ Analyser	Analyzer for reflected light with 360° rotatable polarized direction. Separate polarizer for transmitted light and reflected light
17	Drawing Tube	Should have additional drawing tube for fission track length measurements.

18	Digital camera	• Resolution: 12MP or more, ~30 fps, 3 X 8 bits or more colour depth • Sensor type CMOS Colour sensor suitable for all contrast techniques. • Optical Interface : C-Mount, Sensor size ½.3" or bigger
19.	Image Analyser Software	Software to have control of • HRD/Observation Mode, Image annotation, Movie acquisition • Intensity control of all the lamps/Aperture stop • Should support basic microscope operations like live image preview and image capture • Image analysis software for particle, grain counting.
20	Computer System	Branded computer system with 24" LED slim screen, intel i7 processor, 8 GB RAM, 2 GB graphic card, 2 TB hard disc, Original window 10 pro software installed, Compatible with camera and microscope.
21	Warranty	3 years warranty.
Note:		1. Microscope, objectives, Camera & Software are from single manufacture for better integration and future upgradation. 2. Microscope dust cover, all USB cables for microscopes and PC-connection wires should be with microscopes.