



Bid Number/बोली क्रमांक (बिड संख्या):
GEM/2024/B/5338747
Dated/दिनांक : 29-08-2024

Bid Document/ बिड दस्तावेज़

Bid Details/बिड विवरण	
Bid End Date/Time/बिड बंद होने की तारीख/समय	19-09-2024 18:00:00
Bid Opening Date/Time/बिड खुलने की तारीख/समय	19-09-2024 18:30:00
Bid Offer Validity (From End Date)/बिड पेशकश वैधता (बंद होने की तारीख से)	180 (Days)
Ministry/State Name/मंत्रालय/राज्य का नाम	Ministry Of Mines
Department Name/विभाग का नाम	Na
Organisation Name/संगठन का नाम	Jawaharlal Nehru Aluminium Research Development And Design Centre (jnarddc)
Office Name/कार्यालय का नाम	West
Total Quantity/कुल मात्रा	1
Item Category/मद केटेगरी	Graphite Furnace - Atomic Absorption Spectroscopy
Minimum Average Annual Turnover of the bidder (For 3 Years)/बिडर का न्यूनतम औसत वार्षिक टर्नओवर (3 वर्षों का)	35 Lakh (s)
OEM Average Turnover (Last 3 Years)/मूल उपकरण निर्माता का औसत टर्नओवर (गत 3 वर्षों का)	240 Lakh (s)
Years of Past Experience Required for same/similar service/उन्हीं/समान सेवाओं के लिए अपेक्षित विगत अनुभव के वर्ष	3 Year (s)
MSE Exemption for Years of Experience and Turnover/ अनुभव के वर्षों से एमएसई छूट	No
Startup Exemption for Years of Experience and Turnover/ अनुभव के वर्षों से स्टार्टअप छूट	No
Document required from seller/विक्रेता से मांगे गए दस्तावेज़	Experience Criteria,Past Performance,Bidder Turnover,Certificate (Requested in ATC),OEM Authorization Certificate,OEM Annual Turnover,Additional Doc 1 (Requested in ATC),Compliance of BoQ specification and supporting document *In case any bidder is seeking exemption from Experience / Turnover Criteria, the supporting documents to prove his eligibility for exemption must be uploaded for evaluation by the buyer
Past Performance/विगत प्रदर्शन	80 %

Bid Details/बिड विवरण	
Bid to RA enabled/बिड से रिवर्स नीलामी सक्रिय किया	No
Type of Bid/बिड का प्रकार	Two Packet Bid
Time allowed for Technical Clarifications during technical evaluation/तकनीकी मूल्यांकन के दौरान तकनीकी स्पष्टीकरण हेतु अनुमत समय	3 Days
Inspection Required (By Empanelled Inspection Authority / Agencies pre-registered with GeM)	No
Evaluation Method/मूल्यांकन पद्धति	Total value wise evaluation

EMD Detail/ईएमडी विवरण

Advisory Bank/एडवाइजरी बैंक	IDBI Bank
EMD Amount/ईएमडी राशि	210000

ePBG Detail/ईपीबीजी विवरण

Advisory Bank/एडवाइजरी बैंक	IDBI Bank
ePBG Percentage(%) / ईपीबीजी प्रतिशत (%)	5.00
Duration of ePBG required (Months) / ईपीबीजी की अपेक्षित अवधि (महीने).	14

(a). EMD EXEMPTION: The bidder seeking EMD exemption, must submit the valid supporting document for the relevant category as per GeM GTC with the bid. Under MSE category, only manufacturers for goods and Service Providers for Services are eligible for exemption from EMD. Traders are excluded from the purview of this Policy./जेम की शर्तों के अनुसार ईएमडी छूट के इच्छुक बिडर को संबंधित केटेगरी के लिए बिड के साथ वैध समर्थित दस्तावेज प्रस्तुत करने हैं। एमएसई केटेगरी के अंतर्गत केवल वस्तुओं के लिए विनिर्माता तथा सेवाओं के लिए सेवा प्रदाता ईएमडी से छूट के पात्र हैं। व्यापारियों को इस नीति के दायरे से बाहर रखा गया है।

(b). EMD & Performance security should be in favour of Beneficiary, wherever it is applicable./ईएमडी और संपादन जमानत राशि, जहां यह लागू होती है, लाभार्थी के पक्ष में होनी चाहिए।

Beneficiary/लाभार्थी :

Senior Administrative Officer
West, NA, Jawaharlal Nehru Aluminium Research Development and Design Centre (JNARDDC), Ministry of Mines
(R Srinivasan)

MII Purchase Preference/एमआईआई खरीद वरीयता

MII Purchase Preference/एमआईआई खरीद वरीयता	Yes
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MSE Purchase Preference/एमएसई खरीद वरीयता

MSE Purchase Preference/एमएसई खरीद वरीयता

Yes

1. The minimum average annual financial turnover of the bidder during the last three years, ending on 31st March of the previous financial year, should be as indicated above in the bid document. Documentary evidence in the form of certified Audited Balance Sheets of relevant periods or a certificate from the Chartered Accountant / Cost Accountant indicating the turnover details for the relevant period shall be uploaded with the bid. In case the date of constitution / incorporation of the bidder is less than 3-year-old, the average turnover in respect of the completed financial years after the date of constitution shall be taken into account for this criteria.

2. Experience Criteria: In respect of the filter applied for experience criteria, the Bidder or its OEM {themselves or through reseller(s)} should have regularly, manufactured and supplied same or similar Category Products to any Central / State Govt Organization / PSU for number of Financial years as indicated above in the bid document before the bid opening date. Copies of relevant contracts to be submitted along with bid in support of having supplied some quantity during each of the Financial year. In case of bunch bids, the category of primary product having highest value should meet this criterion.

3. OEM Turn Over Criteria: The minimum average annual financial turnover of the OEM of the offered product during the last three years, ending on 31st March of the previous financial year, should be as indicated in the bid document. Documentary evidence in the form of certified Audited Balance Sheets of relevant periods or a certificate from the Chartered Accountant / Cost Accountant indicating the turnover details for the relevant period shall be uploaded with the bid. In case the date of constitution / incorporation of the OEM is less than 3 year old, the average turnover in respect of the completed financial years after the date of constitution shall be taken into account for this criteria.

4. Preference to Make In India products (For bids < 200 Crore): Preference shall be given to Class 1 local supplier as defined in public procurement (Preference to Make in India), Order 2017 as amended from time to time and its subsequent Orders/Notifications issued by concerned Nodal Ministry for specific Goods/Products. The minimum local content to qualify as a Class 1 local supplier is denoted in the bid document. If the bidder wants to avail the Purchase preference, the bidder must upload a certificate from the OEM regarding the percentage of the local content and the details of locations at which the local value addition is made along with their bid, failing which no purchase preference shall be granted. In case the bid value is more than Rs 10 Crore, the declaration relating to percentage of local content shall be certified by the statutory auditor or cost auditor, if the OEM is a company and by a practicing cost accountant or a chartered accountant for OEMs other than companies as per the Public Procurement (preference to Make-in -India) order 2017 dated 04.06.2020. Only Class-I and Class-II Local suppliers as per MII order dated 4.6.2020 will be eligible to bid. Non - Local suppliers as per MII order dated 04.06.2020 are not eligible to participate. However, eligible micro and small enterprises will be allowed to participate .The buyers are advised to refer the OM No.F.1/4/2021-PPD dated 18.05.2023.

[OM No.1 4 2021 PPD dated 18.05.2023](#) for compliance of Concurrent application of Public Procurement Policy for Micro and Small Enterprises Order, 2012 and Public Procurement (Preference to Make in India) Order, 2017.

5. Purchase preference will be given to MSEs having valid Udyam Registration and whose credentials are validated online through Udyam Registration portal as defined in Public Procurement Policy for Micro and Small Enterprises (MSEs) Order, 2012 dated 23.03.2012 issued by Ministry of Micro, Small and Medium Enterprises and its subsequent Orders/Notifications issued by concerned Ministry. If the bidder wants to avail themselves of the Purchase preference, the bidder must be the manufacturer / OEM of the offered product on GeM. Traders are excluded from the purview of Public Procurement Policy for Micro and Small Enterprises and hence resellers offering products manufactured by some other OEM are not eligible for any purchase preference. In respect of bid for Services, the bidder must be the Service provider of the offered Service. Relevant documentary evidence in this regard shall be uploaded along with the bid in respect of the offered product or service and Buyer will decide eligibility for purchase preference based on documentary evidence submitted, while evaluating the bid. If L-1 is not an MSE and MSE Seller (s) has / have quoted price within L-1+ 15% (Selected by Buyer) of margin of purchase preference /price band defined in relevant policy, such MSE Seller shall be given opportunity to match L-1 price and contract will be awarded for 25% (selected by Buyer) percentage of total quantity. The buyers are advised to refer the OM No. F.1/4/2021-PPD dated 18.05.2023 [OM No.1 4 2021 PPD dated 18.05.2023](#) for compliance of Concurrent application of Public Procurement Policy for Micro and Small Enterprises Order, 2012 and Public Procurement (Preference to Make in India) Order, 2017. Benefits of MSE will be allowed only if seller is validated on-line in GeM profile as well as validated and approved by Buyer after evaluation of documents submitted.

6. Past Performance: The Bidder or its OEM {themselves or through re-seller(s)} should have supplied same or similar Category Products for 80% of bid quantity, in at least one of the last three Financial years before the bid opening date to any Central / State Govt Organization / PSU. Copies of relevant contracts (proving supply of cumulative order quantity in any one financial year) to be submitted along with bid in support of quantity supplied in the relevant Financial year. In case of bunch bids, the category related to primary product having

highest bid value should meet this criterion.

Graphite Furnace - Atomic Absorption Spectroscopy (1 pieces)

(Minimum 50% and 20% Local Content required for qualifying as Class 1 and Class 2 Local Supplier respectively/क्रमशः श्रेणी 1 और श्रेणी 2 के स्थानीय आपूर्तिकर्ता के रूप में अर्हता प्राप्त करने के लिए आवश्यक)

Technical Specifications/तकनीकी विशिष्टियाँ

Buyer Specification Document/क्रेता विशिष्टि दस्तावेज़	Download
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Consignees/Reporting Officer/परेषिती/रिपोर्टिंग अधिकारी and/ तथा Quantity/मात्रा

S.No./क्र. सं.	Consignee Reporting/Officer/ परेषिती/रिपोर्टिंग अधिकारी	Address/पता	Quantity/मात्रा	Delivery Days/डिलीवरी के दिन
1	Lalit Mohan	440023,Opp Wadi Police Station Amarawati Road	1	60

Buyer Added Bid Specific Terms and Conditions/क्रेता द्वारा जोड़ी गई बिड की विशेष शर्तें

1. Generic

OPTION CLAUSE: The Purchaser reserves the right to increase or decrease the quantity to be ordered up to 25 percent of bid quantity at the time of placement of contract. The purchaser also reserves the right to increase the ordered quantity by up to 25% of the contracted quantity during the currency of the contract at the contracted rates. Bidders are bound to accept the orders accordingly.

2. Generic

Actual delivery (and Installation & Commissioning (if covered in scope of supply)) is to be done at following address

JNARDDC
Opposite Wadi Police Station
Amravati Road
Wadi
Nagpur - 440023

3. Generic

Bidders are advised to check applicable GST on their own before quoting. Buyer will not take any responsibility in this regards. GST reimbursement will be as per actuals or as per applicable rates (whichever is lower), subject to the maximum of quoted GST %.

4. **Generic**

Data Sheet of the product(s) offered in the bid, are to be uploaded along with the bid documents. Buyers can match and verify the Data Sheet with the product specifications offered. In case of any unexplained mismatch of technical parameters, the bid is liable for rejection.

5. **Generic**

End User Certificate: Wherever Bidders are insisting for End User Certificate from the Buyer, same shall be provided in Buyer's standard format only.

6. **Generic**

Experience Criteria: The Bidder or its OEM {themselves or through reseller(s)} should have regularly, manufactured and supplied same or similar Category Products to any Central / State Govt Organization / PSU for 3 years before the bid opening date. Copies of relevant contracts to be submitted along with bid in support of having supplied some quantity during each of the year. In case of bunch bids, the primary product having highest value should meet this criterion.

7. **Generic**

Installation, Commissioning, Testing, Configuration, Training (if any - which ever is applicable as per scope of supply) is to be carried out by OEM / OEM Certified resource or OEM authorised Reseller.

8. **Generic**

Manufacturer Authorization: Wherever Authorised Distributors/service providers are submitting the bid, Authorisation Form /Certificate with OEM/Original Service Provider details such as name, designation, address, e-mail Id and Phone No. required to be furnished along with the bid

9. **Generic**

Scope of supply includes Training: Number of employees to be trained

2

, Place for Training
JNARDDC, Nagpur
and Duration of training

2

days.

10. **OEM**

IMPORTED PRODUCTS: In case of imported products, OEM or Authorized Seller of OEM should have a registered office in India to provide after sales service support in India. The certificate to this effect should be submitted.

11. **Inspection**

Nominated Inspection Agency: On behalf of the Buyer organization, any one of the following Inspection Agency would be conducting inspection of stores before acceptance:
Pre-dispatch Inspection at Seller Premises (applicable only if pre-dispatch inspection clause has been selected in ATC):

Not Required

Post Receipt Inspection at consignee site before acceptance of stores:
After Installation and Configuration

12. **Forms of EMD and PBG**

Bidders can also submit the EMD with Account Payee Demand Draft in favour of

JNARDDC
payable at
Nagpur

. Bidder has to upload scanned copy / proof of the DD along with bid and has to ensure delivery of hardcopy to the Buyer within 5 days of Bid End date / Bid Opening date.

13. **Forms of EMD and PBG**

Bidders can also submit the EMD with Payment online through RTGS / internet banking in Beneficiary name

JNARDDC
Account No.
041104000192392
IFSC Code
IBKL0000041
Bank Name
IDBI Bank
Branch address
Civil Lines, Nagpur

. Bidder to indicate bid number and name of bidding entity in the transaction details field at the time of on-line transfer. Bidder has to upload scanned copy / proof of the Online Payment Transfer along with bid.

14. **Forms of EMD and PBG**

Successful Bidder can submit the Performance Security in the form of Account Payee Demand Draft also (besides PBG which is allowed as per GeM GTC). DD should be made in favour of

JNARDDC
payable at
Nagpur

. After award of contract, Successful Bidder can upload scanned copy of the DD in place of PBG and has to ensure delivery of hard copy to the original DD to the Buyer within 15 days of award of contract.

15. **Forms of EMD and PBG**

Successful Bidder can submit the Performance Security in the form of Payment online through RTGS / internet banking also (besides PBG which is allowed as per GeM GTC). On-line payment shall be in Beneficiary name

JNARDDC
Account No.
041104000192392
IFSC Code
IBKL0000041
Bank Name
IDBI Bank
Branch address
Civil Lines, Nagpur

. Successful Bidder to indicate Contract number and name of Seller entity in the transaction details field at the time of on-line transfer. Bidder has to upload scanned copy / proof of the Online Payment Transfer in place of PBG within 15 days of award of contract.

16. **Warranty**

Warranty period of the supplied products shall be 1 years from the date of final acceptance of goods or after completion of installation, commissioning & testing of goods (if included in the scope of supply), at consignee location. OEM Warranty certificates must be submitted by Successful Bidder at the time of delivery of Goods. The seller should guarantee the rectification of goods in case of any break down during the guarantee period. Seller should have well established Installation, Commissioning, Training, Troubleshooting and Maintenance Service group in INDIA for attending the after sales service. Details of Service Centres near consignee destinations are to be uploaded along with the bid.

17. **Scope of Supply**

Scope of supply (Bid price to include all cost components) : Supply Installation Testing and Commissioning of Goods

18. **Certificates**

Bidder's offer is liable to be rejected if they don't upload any of the certificates / documents sought in the Bid document, ATC and Corrigendum if any.

19. **Service & Support**

Availability of Service Centres: Bidder/OEM must have a Functional Service Centre in the State of each Consignee's Location in case of carry-in warranty. (Not applicable in case of goods having on-site warranty). If service center is not already there at the time of bidding, successful bidder / OEM shall have to establish one within 30 days of award of contract. Payment shall be released only after submission of documentary evidence of having Functional Service Centre.

20. **Warranty**

Successful bidder will have to ensure that adequate number of dedicated technical service personals / engineers are designated / deployed for attending to the Service Request in a time bound manner and for ensuring Timely Servicing / rectification of defects during warranty period, as per Service level agreement indicated in the relevant clause of the bid.

21. **Buyer Added Bid Specific ATC**

Buyer Added text based ATC clauses

1. Catalogue of the offered product must be submitted with bid documents for technical evaluation. Catalogue and offered model submitted with this bid must be available at OEM website. Fabricated /customized catalogue will not be accepted.
2. If any deviation in offered model with JNARDDC technical specifications, same to be mentioned in technical compliance sheet.
3. Bidder have to submit 03 satisfied customers (Govt/PVT/PSU/Educational Institution) details where bidder has sold this product. For this copy of purchase order along with installation report to be submitted. Name of buyers, mobile no and e-mail address also to be submitted. Without this bid will be simply rejected.
4. Demonstration of offered model will be the part of technical evaluation. JNARDDC reserve the rights to ask any bidder to arrange demonstrate the offered model.

Disclaimer/अस्वीकरण

The additional terms and conditions have been incorporated by the Buyer after approval of the Competent Authority in Buyer Organization, whereby Buyer organization is solely responsible for the impact of these clauses on the bidding process, its outcome, and consequences thereof including any eccentricity / restriction arising in the bidding process due to these ATCs and due to modification of technical specifications and / or terms and conditions governing the bid. If any clause(s) is / are incorporated by the Buyer regarding following, the bid and resultant contracts shall be treated as null and void and such bids may be cancelled by GeM at any stage of bidding process without any notice:-

1. Definition of Class I and Class II suppliers in the bid not in line with the extant Order / Office Memorandum issued by DPIIT in this regard.
2. Seeking EMD submission from bidder(s), including via Additional Terms & Conditions, in contravention to

exemption provided to such sellers under GeM GTC.

3. Publishing Custom / BOQ bids for items for which regular GeM categories are available without any Category item bunched with it.
4. Creating BoQ bid for single item.
5. Mentioning specific Brand or Make or Model or Manufacturer or Dealer name.
6. Mandating submission of documents in physical form as a pre-requisite to qualify bidders.
7. Floating / creation of work contracts as Custom Bids in Services.
8. Seeking sample with bid or approval of samples during bid evaluation process. (However, in bids for [attached categories](#), trials are allowed as per approved procurement policy of the buyer nodal Ministries)
9. Mandating foreign / international certifications even in case of existence of Indian Standards without specifying equivalent Indian Certification / standards.
10. Seeking experience from specific organization / department / institute only or from foreign / export experience.
11. Creating bid for items from irrelevant categories.
12. Incorporating any clause against the MSME policy and Preference to Make in India Policy.
13. Reference of conditions published on any external site or reference to external documents/clauses.
14. Asking for any Tender fee / Bid Participation fee / Auction fee in case of Bids / Forward Auction, as the case may be.

Further, if any seller has any objection/grievance against these additional clauses or otherwise on any aspect of this bid, they can raise their representation against the same by using the Representation window provided in the bid details field in Seller dashboard after logging in as a seller within 4 days of bid publication on GeM. Buyer is duty bound to reply to all such representations and would not be allowed to open bids if he fails to reply to such representations.

[This Bid is also governed by the General Terms and Conditions/ यह बिड सामान्य शर्तों के अंतर्गत भी शासित है](#)

In terms of GeM GTC clause 26 regarding Restrictions on procurement from a bidder of a country which shares a land border with India, any bidder from a country which shares a land border with India will be eligible to bid in this tender only if the bidder is registered with the Competent Authority. While participating in bid, Bidder has to undertake compliance of this and any false declaration and non-compliance of this would be a ground for immediate termination of the contract and further legal action in accordance with the laws./जेम की सामान्य शर्तों के खंड 26 के संदर्भ में भारत के साथ भूमि सीमा साझा करने वाले देश के बिडर से खरीद पर प्रतिबंध के संबंध में भारत के साथ भूमि सीमा साझा करने वाले देश का कोई भी बिडर इस निविदा में बिड देने के लिए तभी पात्र होगा जब वह बिड देने वाला सक्षम प्राधिकारी के पास पंजीकृत हो। बिड में भाग लेते समय बिडर को इसका अनुपालन करना होगा और कोई भी गलत घोषणा किए जाने व इसका अनुपालन न करने पर अनुबंध को तत्काल समाप्त करने और कानून के अनुसार आगे की कानूनी कार्रवाई का आधार होगा।

---Thank You/धन्यवाद---

Specifications of GF-AAS

1. Atomizer System

- a. A space-saving compact integrated and stacked high performance dual atomizer system with inbuilt flame and Zeeman Graphite furnace atomizers.
- b. Incorporate preferably a true double beam flame spectrometer.
- c. An instant changeover from Flame to Furnace mode and vice-versa should be automatic through the software.

2. Flame Atomizer

- a. The system should have software controlled automatic vertical and horizontal alignment of the flame burner head for optimum light transmission.
- b. System should come with Standard 10 cm corrosion resistant high-quality titanium burner head for Air – Acetylene flame for better absorbance. For elements that need N_2O – Acetylene flame, 5 cm burner head should also be quoted.
- c. System should have software-controlled flame ignition and it should have all safety interlocks to avoid instrument damage and human health hazard.
- d. System should be quoted with suitable air compressor.

3. Furnace Atomizer

- a. The Graphite Furnace Atomizer alignment should be fully automatic, and time of changeover from flame to furnace should be <2 minutes. The Furnace Autosampler must be integrated to main Spectrometer with a minimum of 100 sample positions and should have the auto dilution capability.
- b. The Graphite Furnace system should be equipped with pyrolytically coated graphite tube, L'vov platform, rapid furnace heating, internal gas stop, matrix modification, fast signal processing, peak area measurements and Zeeman background correction for effective interference removal.
- c. The heating of the Graphite Atomizer should be through the walls of the tube, ensuring the uniform temperature distribution across the graphite tube.
- d. A furnace should have option of injection temperature which can be applied while injecting sample in graphite tube.
- e. A graphite furnace should have option of pre-concentration of sample by multiple injection for very lower detection.

- f. The Graphite Furnace Atomizer must be permanently aligned with no movement, alignment and optimization required. The Furnace Autosampler must be integrated to main Spectrometer with a minimum of 100 sample positions and should have the auto-dilution capability.
- g. Dispensed sample volume should be in the range of 1 -80 ul in increment of 1 ul or better and flushing volume should be more than 1 ml.
- h. The system should be equipped with an integrated graphite furnace camera for easy autosampler tip alignment and real time viewing of the process happening in graphite furnace.
- i. The Graphite Furnace system should be equipped with pyrolytically coated graphite tube with platform, rapid furnace heating with deuterium background correction for furnace.
- j. Graphite furnace should capable to get desired sensitivity of all elements. Temperature heating should not be more than 2600°C to avoid corrosion of tube which normally happens due to higher temperature.
- k. An imported Self-priming water recirculating chiller unit of appropriate capacity for cooling of Graphite Furnace must be quoted by the manufacturer.
- l. Variable gas flow for furnace for low minimum consumption an external protective gas stream around the graphite tube prevents the entrance of outside air to maximize tube life.
- m. System should have feasibility to set a sequence to run different elements sequentially without manual disturbance.

4. Lamps

- a. The system should have 8 lamp holders with a provision of automatic lamp selection and fixed lamp positions. Horizontal mounting for easy installation.
- b. Built-in power supplies for both the Coded Hollow Cathode Lamps for (Platinum, Palladium, Gold, Silver, Bismuth, Beryllium) and the special lamps that are used for the analysis of volatile elements like As, Hg, Se. (e.g. Boosted HCL's Ultra Lamps, Super Lamps, Electrode Less Discharge Lamps, etc.) Single element standards for all elements 1000 ppm (500 mL) each.
- c. Lamp selection, alignments and operating current should be software controlled.
- d. Lamp usage should be monitored by the software.

5. Sample Introduction System

- a. A high sensitivity nebulizer system including impact bead and flow spoiler with corrosion resistant against the acids like 5% hydrofluoric acid, hydrochloric acid and Nitric Acid.
- b. Corrosion resistant pre-mix spray chamber.

6. Optical System

- a. Monochromator system with a diffraction grating ruling density of at least 1800 lines/mm blazed in both the UV and Visible regions.
- b. A system should be able to select wavelengths automatic and manual both.
- c. A focal length of minimum above 270 mm and the Reciprocal Linear Dispersion of 1.6 nm/mm.
- d. Variable slit width between 0.2 to 2.0 nm or more with automatic slit selection.
- e. System should have the maximum light transmission for the best detection limits with least maintenance.
- f. System should automatically adjust to changes in lamp intensity for stable baselines and compensates for drift multiple times per second.
- g. System should have fast start-up and exceptional long-term stability without recalibration.

7. Detector

- a. Wide range Photomultiplier Tubes (PMT) or Solid-State Detector, with highest quantum efficiency with dedicated areas for sample and reference beams.
- b. Wavelength range: 190 – 900 nm or better
- c. Operator selectable Read time from 0.1 to 120 seconds in increments of 0.1 second.

8. Background Correction Methodology

- a. High speed continuum source Deuterium Lamp Background Correction for Flame.
- b. Zeeman Background Correction for the Graphite Furnace with the magnetic field parallel to the light beam.

9. Gas Flows system

- a. Software controlled flame ignition and automatic changeover of oxidant flow from acetylene to nitrous oxide when switching to or from air-acetylene to nitrous oxide - acetylene flame.
 - b. Fully software-controlled oxidant and fuel gas flow monitoring.
 - c. All safety interlocks built-in and additional feature like Burner Head Interlock, Nebulizer/End Cap Interlock, and Drain Interlock to be built-in.
- 10. Sensitivity:** Vendor should provide report of the quoted system demonstrating >0.8 absorbance with the precision of $<0.5\%$ RSD from 5 second integrations for 5 ppm Cu standard.
- 11. System should be quoted with flow injection** hydride generation accessory to connect with both FLAME to achieve low detection limits for volatile elements like Hg, As, Sb etc. Sample consumption should be 500uL to 1000ul per replicate. System should have capability to couple hydride system with graphite furnace (Hydride System-Graphite furnace hyphenation) to achieve very lower concentrations from ppt to low ppb.
- 12.** Vendor should quote appropriate UPS 20 KVA, fume hood, acetylene cylinder, nitrous oxide, Argon (if Hydride quoted) cylinder with dual stage regulators and purification panel, PC and printer.
- 13. Additional Consumables:**
- a. Nebulizer corrosion resistant – 1 no.
 - b. Graphite tubes – 100 nos.
 - c. Sample inlet tube – 2 nos.
 - d. Quartz cell for hydride – 1 no.