



**INTERNATIONAL ADVANCED RESEARCH CENTRE FOR  
POWDER METALLURGY AND NEW MATERIALS (ARCI)**

Balapur P.O, R.R. District, Hyderabad – 500 005, Telangana, India

Tel: 040-24452326, Fax: 040-24442699

Web Site: [www.arci.res.in](http://www.arci.res.in) eMail: stores@arci.res.in

**Tender No. CF20150108/PO**

**Date: 15.01.2019**

<b>e-TENDER DOCUMENT</b>
<b>PROCUREMENT OF TG DTA DSC COUPLED MASS SPECTROMETER</b>

1.	EMD ( Earnest Money Deposit/Bid Security)	<b>Rs 2,37,500/-</b>
2.	e-Tender document published date	<b>15.01.2019</b>
3.	Bid documents can be accessed from	<a href="https://eprocure.gov.in/eprocure/app">https://eprocure.gov.in/eprocure/app</a>
4.	Clarification start date and end date	<b>16.01.2019 to 25.01.2019</b>
5.	Bid submission start date and time	<b>28.01.2019 at 10:00 Hrs.</b>
6.	Bid submission end date and time	<b>28.02.2019 before 15:30 Hrs.</b>
7.	Online Bids opening date and time (for Technical Bids)	<b>04.03.2019 at 11:00 Hrs.</b>



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### Instructions to Bidders

## Table of Contents

Sl. No.	Description	Page No.
1.	Notice for inviting e-tender	3-5
2.	Special Instructions for online bid submission	6-8
3.	Part – 1: Technical Bid -Terms and conditions	9-13
4.	Part – 2: Earnest Money Deposit-Terms and Conditions	14
5.	Part – 3: Price Bid -Terms and Conditions	15-18
6.	Declaration by Vendor	19
7.	Scope of Supply (Annexure – I)	20-25
8.	Checklist	26



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### NOTICE FOR INVITING OPEN E-TENDER

International Advanced Research Centre for Powder Metallurgy and New Materials (henceforth referred to as ARCI) is an Autonomous Research and Development Centre of Department of Science and Technology (DST), Government of India with main campus at Hyderabad and with operations in Chennai and Gurugram.

#### **SERVICE: PROCUREMENT OF TG DTA DSC COUPLED MASS SPECTROMETER.**

You are invited to submit your most competitive online quotation through CPP Portal (Central Public Procurement Portal) website <https://eprocure.gov.in> on or before the prescribed due date. Manual bids shall not be accepted except for the original documents, if any mentioned in this tender.

Complete tender can be viewed and submitted through <https://eprocure.gov.in/eprocure/app>. To use the Electronic tender portal <https://eprocure.gov.in/eprocure/app> the bidders need to register on the portal.

**Tender Enquiry No: (Case No.) CF20150108/PO date 15.01.2019**

- Last date and time of submission of Tender online (EMD, Technical Bid, and Price Bid): **28.02.2019 before 03:30 PM.**
- EMD should be in the form of Demand Draft drawn in favour of **Director, International Advanced Research Centre, payable at Hyderabad.**
- **Estimated value: Rs. 95,00,000/-**
- Services to be provided at:  
**Centre for Automotive Energy Materials (CAEM), International Advanced Research Centre for Powder Metallurgy and New Materials (ARCI), IIT-M Research Park, Phase-1, 7<sup>th</sup> Floor, Section B, 6 Kanagam Road, Taramani, Chennai 600 113, Tamil Nadu, India.**
- **Estimated Delivery period: 04 (four) Months**

#### **Validity of Bid**

Quotation should have minimum validity of **120 days** from the date of opening

**Last date for submission: 28.02.2019 before 15:30 Hrs.**

**The bidders are required to submit soft copies of their bids electronically on the CPP Portal before the last date stated above using valid Digital Signature Certificates.**

**All the tenders, in which any of the prescribed conditions are not fulfilled or incomplete in any respect are liable to be rejected.**

**Bidders shall select the payment option as offline to pay the EMD and enter details of the Demand Draft, etc**

### **Clarification on bid**

Bidders can seek clarification as per the schedule start and end date through email IDs given below:

For technical clarifications: **sahanamb@arci.res.in**

For commercial clarifications: **stores@arci.res.in**

### **Opening of the tender**

- Only the Technical bid shall be opened online on the date of the tender opening. Price bids of only those firms will be considered for opening whose offer would meet all tender requirements including compliance to technical specifications and has passed all tender conditions/ technical evaluation.
- After opening of the price bids, detailed comparative statement will be generated online and the finalization of successful bidder will be done on L-1 (lowest price) basis as per CPP Portal.

### **Award of Contract**

Contract will be awarded to successful bidder and a copy of the award of the contract will be uploaded in CPP portal after finalizing the tender.

### **DISQUALIFICATION OF TENDERS:**

The tenders are liable for rejection in the following circumstances:

- If they are not in line with the terms and conditions of this tender notice.
- Conditional quotations
- Incomplete tenders
- Tenders without EMD
- Tenders submitted through Fax or e-mail.

Director, ARCI reserves the right to accept or reject any or all tenders either in part or in full or to split the order without assigning any reasons there for.

**The original hard copies of Technical Bid documents along with EMD, supporting documents, etc., should be submitted on or before the due date to the following address:**

**International Advanced Research Centre for Powder Metallurgy and New Materials, Balapur Post, Hyderabad – 500 005, Telangana**

**IMPORTANT NOTE: Amendment, Corrigendum if any to this tender document, WILL BE HOSTED ONLY IN ARCI WEBSITE and CPP Portal and no separate Press Notification will be issued. Bidders are advised to visit our website and CPP Portal regularly to know such details.**

**Director, ARCI, Hyderabad**

## **SPECIAL INSTRUCTIONS FOR ONLINE BID SUBMISSION:**

Instructions to the Bidders to submit the bids online through the Central Public Procurement Portalfore-Procurement are at <https://eprocure.gov.in/eprocure/app>. The bidders must carefully follow the instructions.

- Possession of valid Digital Signature Certificate (DSC) and enrolment/registration of the contractors/bidders on the e-procurement/e-tender portal is a prerequisite for e-tendering.
- Bidder should do the enrolment in the e-Procurement site using the "Click here to Enroll" option available on the home page. Portal enrolment is generally free of charge. During enrolment/registration, the bidders should provide the correct/true information including valid e-mail-id. All the correspondence shall be made directly with the contractors/bidders through e-mail-id provided.
- Bidder need to login to the site through their user ID/ password chosen during enrolment/registration.
- Then the Digital Signature Certificate (Class III Certificates with signing key usage) issued by NIC/SIFY/TCS/nCode/eMudra or any Certifying Authority recognized by CCA India on e-Token / Smart Card, should be registered.
- The DSC that is registered only should be used by the bidder and should ensure safety of the same.
- Contractor / Bidder may go through the tenders published on the site and download the required tender documents/ Annexures for the tenders he/she is interested.
- After downloading / getting the tender document/ Annexures/ Appendices, the Bidder should go through them carefully and then submit the documents as asked, otherwise bid will be rejected.
- If there are any clarifications, this may be obtained online through the tender site, or through the contact details. Bidder should take into account the corrigendum / addendum published before submitting the bids online.
- Bidder then logs in to the site through the secured log in by giving the user id/ password chosen during enrolment/registration and then by giving the password of the e-Token/ Smart Card to access DSC.
- Bidder selects the tender which he/she is interested in by using the search option & then moves it to the 'my tenders' folder.
- From my tender folder, he selects the tender to view all the details indicated.
- It is construed that the bidder has read all the terms and conditions before submitting their offer. Bidder should go through the tender Annexures and appendices carefully and upload the documents as called for; otherwise, the bid will be rejected.
- Bidder, in advance, should get ready the bid documents to be submitted as indicated in the tender document/ Annexure and generally, they can be in PDF/xls/rar/zip/dwf formats. If there is more than one document, they can be clubbed together and can be provided in the requested format. Each document to be uploaded through online for the tenders should be

less than 2 MB. If any document is more than 2MB, it can be reduced through zip/rar and the same can be uploaded, if permitted. Bidders Bid documents may be scanned with 100 dpi with black and white option. However if the file size is less than 1 MB the transaction uploading time will be very fast.

- Bidder should take into account the corrigendum / addendum published from time to time before submitting the online bids.
- The Bidders can update well in advance, the documents such as certificates, annual report details etc., under My Space option and these can be selected as per tender requirements and then send along with bid documents during bid submission. This will facilitate the bid submission process faster by reducing upload time of bids.
- While submitting the bids online, the bidder reads the terms & conditions and accepts the same to proceed further to submit the bid packets.
- Bidder should submit the EMD as specified in the tender. The original should be posted/couriered/given in person to the Tender Inviting Authority, within the bid submission due date & time for the tender. **Scanned copy of the instrument should be uploaded as part of the offer.**
- The bidder has to select the payment option as offline to pay the EMD as applicable and enter details of the instruments
- The details of the DD/BC, physically sent, should tally with the details available in the scanned copy and the data entered during bid submission time. Otherwise submitted bid will not be acceptable.
- The bidder has to digitally sign and upload the required bid documents one by one as indicated. Bidders to note that the very act of using DSC for downloading the bids and uploading their offers shall be deemed to be a confirmation that they have read all sections and pages of the bid document including General conditions of contract without any exception and have understood the entire document and are clear about the requirements of the tender requirements.
- The bidder has to upload the relevant files required as indicated in the covered content. In case of any irrelevant files, the bid will be rejected.
- **If the price bid format is provided in a spread sheet file like BoQ\_xxxx.xls, the rates offered should be entered in the allotted space only and uploaded after filling the relevant columns. The Price Bid/ BOQ template must not be modified/replaced by the bidder, else the bid submitted is liable to be rejected for this tender.**
- The bidders are requested to submit the bids through online e-tendering system to the Tender Inviting Authority (TIA) well before the bid submission end date & time (as per Server System Clock). The TIA will not be held responsible for any sort of delay or the difficulties faced during the submission of bids online by the bidders at the eleventh hour.
- After the bid submission (i.e after Clicking "Freeze Bid Submission" in the portal), the acknowledgement number, given by the system should be printed by the bidder and kept as a record of evidence for online submission of bid for the

particular tender and will also act as an entry pass to participate in the bid opening date.

- The time settings fixed in the server side & displayed at the top of the tender site, will be valid for all actions of requesting, bid submission, bid opening etc., in the e-tender system. The bidders should follow this time during bid submission.
- All the data being entered by the bidders would be encrypted using PKI encryption techniques to ensure the secrecy of the data. The data entered will not be viewable by unauthorized persons during bid submission & not be viewable by any one until the time of bid opening.
- Any bid document that is uploaded to the server is subjected to symmetric encryption using a system generated symmetric key. Further this key is subjected to asymmetric encryption using buyers/bid openers public keys. Overall, the uploaded tender documents become readable only after the tender opening by the authorized bid openers. The confidentiality of the bids is maintained since the secured Socket Layer 128 bit encryption technology is used. Data storage encryption of sensitive fields is done.
- The bidder should logout of the tendering system using the normal logout option available at the top right hand corner and not by selecting the (X) exit option in the browser.
- For any queries regarding e-tendering process, the bidders are requested to contact as provided in the tender document. For any further queries, the bidders are asked to contact over phone as mentioned in the CPP website or send an email to - [cphp-nic@nic.in](mailto:cphp-nic@nic.in).



PART-1  
**TECHNICAL BID - TERMS AND CONDITIONS**

**I. Vendor qualification criteria:**

- A. Original Equipment Manufacturer (OEM) or authorized representatives of OEM only can quote for this tender. Vendor should submit authorization letter valid on tender date from OEM along with the quotation.
- B. The OEM should have proven expertise in manufacture and supply of the item.
- C. The bidder should have supplied at least 10 or more similar units in India or abroad in last 05 years.
- D. It is essential that the manufacturer shall provide the list of users of the equipment with contact particulars.
- E. OEM is required to submit a letter of commitment at the time of quote for supply of spares and also for efficient and prompt after sales service of the equipment for a minimum period of 10 years after the guarantee/warranty period under mutually agreed terms and conditions.
- F. Failure to meet any of the above vendor qualification criteria may lead to disqualification of tender at technical evaluation stage itself and vendor's quotation may not be considered for procurement.

**II. Pre dispatch inspection**

- A. The manufacturer/supplier of the unit shall demonstrate, if required, at their works during pre-dispatch inspection by ARCI personnel and shall satisfy all the technical specifications as described in the tender document.
- B. The manufacturer /supplier of the unit shall demonstrate the features as provided in **Annexure-I (Scope of supply work)**.
- C. All the consumables, raw materials, required for the above demonstration should be arranged by the tenderer.
- D. All the utilities and manpower required for the demonstration shall be arranged by the supplier only

**III. Acceptance criteria:**

- A. If required, the manufacturer/supplier's trained engineer should carry out installation and commissioning of the unit at ARCI.
- B. The entire functionality of the equipment according to the specifications should be demonstrated at ARCI.
- C. The manufacturer/supplier of the unit shall demonstrate the features as specified in **Annexure I (Scope of work)**.

D. Infrastructure required for the above demo will be arranged by ARCI.

#### **IV. Other aspects:**

##### **A. PATENT RIGHTS:**

The Supplier shall indemnify ARCI against all third-party claims of infringement of patent, trademark or industrial design rights, copy rights arising from use of the Goods or any part thereof in India.

##### **B. Training:**

The manufacturer shall impart training in the operation and preventive/breakdown maintenance of the complete unit including sub-parts during installation to ARCI personnel for at least 4 no. of day at ARCI.

##### **C. Utilities/Infrastructure for installation:**

A. Supplier shall indicate all the required utilities/infrastructure such as power, water, gas, etc including power backup requirements.

B. Supplier shall provide overall dimensions of the Unit along with floor area/height of the site or building, including foundation details if any, for accommodating the Unit.

C. The operating environment for the Unit including temperature and humidity control, anti-vibration, EMI, EMC etc. should be indicated.

D. If any charges extra are payable for Installation and Commissioning, the same should be included in the total cost of the stores as per the price schedule (BOQ).

E. The equipment should be lifted to 8<sup>th</sup> floor through the passenger lift. Keeping this constrain, the dimension of the packing should be restricted to the dimension of the passenger lift (lift dimension 0.9m width, 1.7m height, 2.0m depth)

##### **D. Manuals, software and other drawings etc.:**

The following documents (in English) shall be provided along with the Unit in both hardcopy and softcopy forms:

- A. Operation and maintenance manuals, troubleshooting procedures, calibration methods, wiring and other schematic diagrams, list of components, spares and accessories.
- B. If there are any bought-out systems and components, manuals should be provided in hardcopy and softcopy forms for the same.
- C. Calibration certificates for sensors, instruments, gauges, display units etc. must be provided.
- D. Software upgrades pertaining to the supplied Unit should be provided free of cost as and when new versions are released by the OEM.
- E. Safety and security instruction manual should be provided.

#### **E. After-sales service:**

The supplier shall guarantee efficient and prompt after-sales service including the supply of the spares for a minimum period of 10 years after the guarantee/warranty period under mutually agreed terms and conditions.

#### **F. Bought-out items:**

All bought-out sub-systems and components if any should be of reputed make conforming to international standards. Make and details of all bought-out sub-systems and components shall be specified.

#### **G. General Quote:**

The breakup for accessories or sub system(s) /attachments apart from the basic system, if any, should be quoted separately.

Bidders shall download the Schedule of Quantities and Prices in the XLS Format and save it without changing the name of the file. Bidder shall quote their rate in figures in the appropriate cells, thereafter save and upload the file in financial bid cover (Price Bid) only. Bidder shall quote the prices in the given format BOQ\_XXXX in excel sheet for online submission of bids. The Technical bid also shall be uploaded in CPP Portal in the appropriate place.

It is required to take utmost care for uploading Schedule of Quantities & Prices and any change/modification of the price schedule shall render it unfit for bidding.

**If the template of Schedule of Quantities & Prices file is found to be modified/ corrupted in the eventuality by the bidder, the bid will be rejected.**

#### **H. Export License:**

The supplier should clearly indicate their ability/readiness to obtain the export license /clearance from the concerned authority for the supply of the unit as per the contract specifications to ARCI.

#### **I. Technical compliance statement:**

The vendor should provide item wise details against each and every specification, Deviations if any are to be highlighted.

#### **J. Guarantee/warranty:**

The Unit shall be under warranty **for a period of three years from the date of acceptance.** During the warranty period, all software and hardware updates shall be provided free of cost. Items, if any, excluded from the warranty shall be explicitly mentioned by the supplier.

The Unit shall be guaranteed for satisfactory performance for 3 years from the date of installation, commissioning and acceptance at ARCI. The manufacturer shall replace premature failure of parts during the guarantee period at their cost and risk.

### **K. Delivery/ time schedule:**

The offer shall be accompanied by a detailed delivery time schedule showing the individual time schedule required for submission of initial equipment layout drawings, foundation drawings along with load data, main equipment and sub-assembly drawing, shipment schedule of the equipment as well as the time for installation, commissioning and performance tests.

### **L. Packing:**

The Supplier shall provide such packing of the Goods as is required to prevent their damage or deterioration during transit to their final destination. The packing shall be sufficient to withstand, without limitation, rough handling during transit and exposure to extreme temperatures, salt and precipitation during transit and open storage. Packing case size and weights shall take into consideration, where appropriate, the remoteness of the Goods' final destination and the absence of heavy handling facilities at all points in transit. In order to maintain safety of the equipment, we prefer to have wooden crating with adequate cushion inside for transportation of any goods. The material has to be dispatched with International standard packing to withstand rigors, and to avoid any transit damages.

### **M. Packing Instructions:**

Each package will be marked on three sides with proper paint/indelible ink, the following:

- i. Purchaser Name & Address
- ii. Item Nomenclature
- iii. Order/Contract No.
- iv. Country of Origin of Goods
- v. Packing list reference number

### **N. Insurance:**

The Goods supplied under the Contract shall be fully insured in Indian Rupees against loss or damage incidental to manufacture or acquisition, transportation, storage and delivery.

For delivery of goods at the purchaser's premises, the insurance shall be obtained by the Supplier in an amount equal to 110% of the value of the goods from "Warehouse to warehouse" (final destinations) on "All Risks" basis including War Risks and Strikes. The insurance shall be valid for a period of not less than 3 months after dispatch **or upto installation and commissioning of stores whichever is later.** However, in case of orders placed on FOB/FCA basis, the purchaser shall arrange insurance.

### **O. General instructions:**

- A. The bidder should submit the scanned copy of the Technical Bid for online submission and original hard copy of all the documents must be submitted in an organized and structured manner. No brochures/leaflets etc. should be submitted in loose form. Please indicate page nos. on your quotation. The price should not be mentioned anywhere in this document.
- B. The original hard copies of Technical Bid documents along with supporting documents etc., should be submitted on or before the due date. The bidder should ensure that all the technical documents submitted through online and hard copies are one and the same. If any deviation is found, the tender is liable to be rejected.**

- C. Price Bid should be submitted online only and no other mode of submission is acceptable.**
- D. The technical offer should be complete to indicate that all products and services asked for are quoted. Each page of the bid and strikeout/corrections shall be duly signed and stamped by the bidder. Unsigned Tenders are liable to be rejected. Failure to comply with this requirement may result in the bid being rejected.
- E. The purpose of certain specific conditions is to get or procure best product/service etc. for ARCI. The opinion of Technical Committee shall be the guiding factor for technical short listing.
- F. Vendor should provide list of deliverables / bill of materials and services.

**PART- 2**  
**EARNEST MONEY DEPOSIT – TERMS AND CONDITIONS**

Earnest Money Deposit (EMD) for an amount of Rs. 2,37,500/- in the form of demand draft / Banker's Cheque Drawn in favour of **Director, International Advanced Research Centre, Payable at Hyderabad** should be submitted on or before the due date as part of Technical Bid. **Scanned copy of such document must be attached online along with the technical bid documents, failing which tender document would be rejected.**

No interest is payable on EMD. The EMD will be returned to the bidders(s)/Agents whose offer is not accepted by ARCI within one month from the date of the placing of the final order(s) on the selected bidder(s). EMD of the successful bidder shall be converted into performance guarantee and shall be released on submission of bank guarantee.

EMD in the form of BG is not acceptable.

**Amount of EMD Rs. 2,37,500/- in INR (Rupees Two Lakh Thirty Seven Thousand and Five Hundred Only)**

**Bidder registered with Department of Micro, Small and Medium Enterprises as MSMEs and having valid NSIC registration are exempted for payment of tender fee and EMD subject to submission of documentary evidences. Copies of registration certificate and other supporting documents should be submitted both online and offline.**

**PART- 3**  
**PRICE BID – TERMS AND CONDITIONS**

**PRICE BID SHOULD BE SUBMITTED ONLINE ONLY AND NO OTHER MODE OF SUBMISSION IS ACCEPTABLE.**

Bidders shall download the Schedule of Quantities and Prices in the XLS Format and save it without changing the name of the file. Bidder shall quote their rate in figures in the appropriate cells, thereafter save and upload the file in financial bid cover (Price Bid) only. Bidder shall quote the prices in the given format BOQ\_XXXX in excel sheet for online submission of bids. The Technical bid also shall be uploaded in CPP Portal in the appropriate place.

It is required to take utmost care for uploading Schedule of Quantities & Prices and any change/ modification of the price schedule shall render it unfit for bidding.

**If the template of Schedule of Quantities & Prices file is found to be modified/ corrupted in the eventuality by the bidder, the bid will be rejected.**

**I. Terms and Conditions:**

- a) Tenders with any condition, including conditional rebate, are liable to be rejected.
- b) **The Price Bid/BOQ template must not be modified/replaced by the bidder, else the bid submitted is liable to be rejected for this tender.**
- c) **The bidder should carefully read the BOQ columns and feed the price as per the price breakup asked in the BOQ. If the quoted price is not as per the price breakup given in the BOQ, the concerned price bid will be rejected.**
- d) **For Domestic bidders, the unit price of materials is basic cost. GST, packing, forwarding, freight and insurance amount if any may be provided separately as per the BOQ.**
- e) **For Foreign bidders, the unit price of the materials is Ex-Works price and packing, forwarding and freight and insurance charges if any, may be provided separately as per the BOQ.**
- f) **Unit price should include main equipment (total system) including computer hardware and software as per the specifications in scope of the work.**
- g) **Total price is F.O.R. ARCI, Chennai or CIP/CIF, Chennai.**
- h) **Final landing cost shall be basis of price evaluation.**
- i) **The bidder should quote single price in their respective currency for the equipment in the price bid (excel BOQ) taking into account all the items as per their specifications mentioned in SCOPE OF WORK.**
- j) Printed conditions of the vendor submitted with the tender will not be binding on ARCI.
- k) The commercial bids of only the technically qualified bidders shall be considered for further processing.
- l) Commercial Bid (prices quoted) should not be enclosed in the technical bid envelope. If the price quote is submitted with technical bid, the tender is liable to be rejected.
- m) The Director, ARCI reserves the right to accept the offer in full or in part or reject summarily or partly thereof.

## **II. Tenderer to inform himself fully**

The tenderer is required to carefully examine the documents enclosed and get fully aware himself as to all conditions and matters which may in any way affect the works or the cost thereof, before submitting his offer.

If the tenderer finds any discrepancies, omissions, or contradictions in the documents or is in doubt as to the true meaning of any part, he shall at once contact in writing for an interpretation/clarification from the Director, ARCI.

The tenderer shall however not be entitled to any extension of time for submission of his tender on such account, unless the Director extends the due date.

## **III. Payment terms:**

### **1. For import:**

An irrevocable Letter of Credit [L/C] for 100% of the order value will be established by the purchaser in favour of the supplier, through purchaser's bank in India once the following condition is met:

### **Receipt of order acknowledgement and acceptance of the order.**

THE ACTUAL PAYMENT TO SUPPLIER WILL HOWEVER BE RELEASED IN TWO STAGES IN THE FOLLOWING MANNER:

Payment for 90% of the order value will be made upon shipment of the equipment and negotiation of the following shipping documents through L/C:

- A) Signed Commercial Invoice - Original + 5 Copies
- B) Airway Bill/Bill of lading - Original + 5 Copies.
- C) Packing List -Original + 5 Copies
- D) Certificate of conformity from the supplier that stores/equipment has been tested by the supplier and the same meet the technical specification - Original + 3 Copies.
- E) Supplier's Certificate to the effect that the contents in each package are not less than those entered in the Invoice and the Packing List - Original + 3 Copies.

Balance 10% of the order value will be released through L/C upon submission of the following documents:

- A) Commercial Invoice for 10% order value.
- B) Final Acceptance Certificate [FAC] issued by the purchaser/authorized representative in original against satisfactory installation and commissioning of the equipment at ARCI Site.
- C) Bank Guarantee Equivalent to 10% of total order value covering warranty period of the



equipment issued or counter guaranteed by an Indian Bank clearly mentioning the relation with OEM if submitted by Indian Agent.

D) If the above-mentioned performance bank guarantee is not provided, 10% of the order value (i.e. second stage payment) will be released only after the expiry of the warranty period from the date of FAC.

## **2. Domestic purchase:**

### Payment Terms

Subject to deduction of taxes at source, if any,

90% of the goods cost + 100% taxes will be paid after receipt of the goods at our site subject to inspection & acceptance of the goods/works/commissioning by ARCI authorities.

Balance 10% will be paid against submission of Performance Bank Guarantee (i.e. 10% of the total order value excluding taxes etc.) from a Nationalized /Scheduled Bank valid till the expiry of the warranty period OR after completion of warranty period from the date of successful commissioning of equipment at ARCI.

## **IV. Inspection Certificate (IC)**

The end user will provide inspection certificate after receipt of materials based on which payment will be released.

## **V. Liquidated damages (LD)**

As time is the essence of the contract, the work period mentioned in the Service Order should be strictly adhered to. Otherwise, LD clause will be applicable /enforced. If the supplier fails to provide the services mentioned in the order within the stipulated period, the Director, ARCI shall without prejudice to any other right or remedy available in law, levy a penalty for such delay by way of liquidated damages, at 0.5% per week of delay or part thereof, subject to a maximum of 10% of contract value. Such LD will be deducted from any amount due or which may become due to the supplier.

## **VI. Order acceptance**

The successful bidder, on award of contract/order, must send the contract/order acceptance in writing, within 15 days of award of contract.

## **VII. Award of contract:**

ARCI reserves the right at the time of award of Contract to increase or decrease the quantity of items specified in the Schedule of Requirements without any change in price or other terms and conditions.

### **VIII. Corrupt or Fraudulent Practices:**

ARCI requires that the bidders who wish to bid for this project have highest standards of ethics. ARCI will reject a bid if it determines that the Bidder recommended for award has engaged in corrupt or fraudulent practices while competing for this contract. ARCI may declare a vendor ineligible, either indefinitely or for a stated duration, to be awarded a contract if it at any time it is determined that the vendor has engaged in corrupt and fraudulent practices during the execution of contract.

### **IX. Interpretation of the clauses in the Tender Document/Contract Document:**

In case of any ambiguity/dispute in the interpretation of any of the clauses in this Tender Document, Director, ARCI's interpretation of the clauses shall be final and binding on all parties.

### **X. Arbitration**

In case of Dispute or difference arising between the Purchaser and a domestic supplier relating to any matter arising out of or connected with this agreement, such disputes or difference shall be settled in accordance with the Indian Arbitration & Conciliation Act, 1996, the rules there under and any statutory modifications or re-enactments thereof shall apply to the arbitration proceedings. The dispute shall be referred to arbitrator appointed by the Director, ARCI. The award of the arbitrator so appointed shall be final, conclusive and binding on all parties to this order.

The venue of the arbitration shall be the place from where the purchase order/contract is issued. Notwithstanding any reference to arbitration herein, the parties shall continue to perform their respective obligations under the Contract unless they otherwise agree.

## **Declaration by the Vendor**

**(to be provided in the following format in their letter head)**

It is hereby declared that I/We the undersigned, have read and examined all the terms and conditions etc. of the tender document for which I/We have signed and submitted the tender under proper authorization. It is also certified that all the terms and conditions of the tender document are fully acceptable to me/us and I/We will abide by the conditions of the tender. We have not given any printed conditions beyond the scope of this tender. It is also certified that I/We/our firm has no objection in signing the contract if the opportunity for the work against this tender is given to me/us.

Date:

Signature:

Name:

Address:

Designation:

On behalf of:

SCOPE OF WORK

**PROCUREMENT OF TG DTA DSC COUPLED MASS SPECTROMETER**

**Simultaneous Thermal Analysis System (TGA-DSC) (Simultaneous Thermogravimetry and Differential Scanning Calorimetry (TG-DSC)) Coupled with mass spectrometer and accessories**

**The bidder should quote single price in their respective currency for above system in the price bid (excel BOQ) taking into account all the following items as per their specifications:**

- a. Simultaneous Thermal Analysis System
- b. Furnace cooling system
- c. Software for STA and Mas spectrometer
- d. vacuum pump and in built vacuum gauges and connectors
- e. Mass flow control block for 3 gases
- f. Transfer line: 2 numbers
- g. Quadrupole Mass Spectrometer with suitable detector with all necessary accessories
- h. Necessary pumping system for mass spectrometer
- i. Sample preparation set
- j. Sapphire heat capacity standard with purity certificate
- k. Minimum 8 certified pure metal standard for the full temperature range up to 1600 degree C 400 mg each with certificate of compliance
- l. Barium carbonate with certificate of compliance
- m. Calcium oxalate monohydrate 2g with certificate of compliance
- n. Benzoic acid 500 mg with certificate of compliance
- o. Silver sulfate 500 mg with certificate of compliance
- p. High sensitivity DSC rod (sensor) with suitable thermocouple and crucible
- q. DTA and TGA rods with suitable sensors, and crucible
- r. Low temperature DSC option (down to ~ -150 C) along with liquid nitrogen sub ambient temperature accessories
- s. Sample crucible Al<sub>2</sub>O<sub>3</sub> 99.7 , ~ 0.3 ml (with appropriate lid 100 pieces
- t. sample cups Pt or Pt/Rh with lids for ~ 100 micro liter 10 numbers
- u. Protective washers
- v. Tool kit for TG DSC crucibles for reshaping of crucible and crucible lids
- w. Computer
- x. Common tools and essential spares

1. Main Equipment: Simultaneous Thermal Analysis System (TGA DSC) (Simultaneous Thermogravimetry and Differential Scanning Calorimetry (TG DSC)) Coupled with mass spectrometer and accessories
2. Measurement Modes: Simultaneous DSC TGA, DTA TGA and TGA measurements mode in the same System. Measurement mode should be based on heat flux sensor design for true DSC
3. Metallic Furnace with temperature range: From ambient up to 1600 degree C
4. Heating rate: 0.1 degree C per min to 20 degree C per min up to 1600 degree C
5. Preferred Cooling rate: 5 degree C per min minimum
6. Temperature resolution + or - 0.1degree C or better, with suitable temperature sensor from ambient to 1600 degree C Temperature accuracy < + or - 0.5 degree C
7. Programmable Temperature controller: microprocessor (With 32 bits or better). Should accommodate at least 20 programs to heat, cool, and isothermal hold to facilitate different linear rates of heating cooling between one or two isothermal steps of different duration
8. Calibration: The system should have facility to calibrate with certified pure metal standard for the full temperature range up to 1600 degree C. Calibration kit with minimum 8 traceable standards for temperature, enthalpy calibration and weight calibration.
9. Appropriate furnace cooling system
10. Pressure: vacuum of 10<sup>-2</sup> mbar along with adequate vacuum pump and in built vacuum gauges (Range: digital in % of vacuum) should also be provided to measure the pressure.
11. Atmospheric condition: dynamic with air, oxygen, inert gas (Nitrogen, Argon) and vacuum
12. Mass flow controllers with automatic switching and setting of gas flow rates through Software.
13. Gas flow rate range should be 10 to 200 ml per min or more for each purge gas in sample chamber, controlled by mass flow meter using digital mass flow controllers. Mass flow controller should be calibrated. Flow rate should be programmable in the software and deliverable as a saved signal in the data file
14. Balance load capacity for TG: 1 g or more TG: Resolution 0.1 to 1 micro gram real resolution for complete measurement range

15. Baseline Linearity + or - 1 micro gram for complete temperature range
16. Balance drift <10 micro gram per hour or better throughout the entire temp range
17. Thermostat for balance (Water or Air cooled) Temperature accuracy +or - 0.01 degree C  
Stability of balance temp. at 22degree C +or - 0.1degree C
18. Sensor type: DTA, DSC, DSC Cp quick change
19. DSC : Resolution : < 1 micro W
20. High sensitivity DSC Cp (heat capacity) sensor: < 3%
21. A suitable interface between Quadrapole Mass Spectrometer and thermogravimetric analyzer to be provided for analyzing the gases coming from the sample
22. Controlling the TG DTA and MS units together through a single Workstation shall be provided. Plotting Editing Exporting the data in ASCII form and as a curve shall be possible with a user friendly software.
23. EGA Needed with the system: Quadrupole Mass Spectrometer with suitable detector and following specification
  1. Mass range (amu): 1 to 300 amu or better
  2. Mass resolution : ~ 1 amu
  3. Sensitivity: ~ 1 ppm (gas dependent)
  4. Ionization source: Electron Ionization
  5. Transfer line temperature: 300 degree C or more
  6. Transfer line: of the order of 1meter, flexible 2 numbers or skimmer arrangement.
  7. Software: synchronized data acquisition along with TGA
  8. Provision for multiple ion detection
  9. Shall have suitable safety interlock to protect the quadrupole analyzer and detector in case of accidental over pressurization.
  10. Necessary pumping system for mass spectrometer to be provided. It should encompass a turbo molecular pump (10<sup>-6</sup> mbar) to pump the mass spectrometer Chamber backed by a suitable roughing backing pump (10<sup>-3</sup> mbar), along with isolation valve and vacuum measurement gauges

### Software:

MS Windows based thermal analysis software for data collection and treatments for routine evaluations such as glass transition, peak area, peak temperature and mass loss. PEAK TEMPERATURE, STEP CALC. with appropriate calibration routines, horizontal or tangential regression lines, tables, 2nd & higher derivative, blank curve subtraction, normalization, signal deconvolution, X scaling with respect to time, temperature, sample temperature; result documentation settings using single step, multi step or multi limit, auto limit; choice of different baselines for interpretation (line, tangential, integral) etc.

Software corrections for thermal resistance and time constant factors to be available.

Data and graphic export to MS office, origin, etc (.csv, .txt, and .dat format).

Software shall have to be compatible for installation in multiple computers and repeated installation have to be allowed. Provision to save data automatically till the temperature of operation in case of power tripping and facility for multitasking.

### Main Accessories:

- (i) Reference standard for calibration for low temperature and high temperature up to 1600 degree C): Calibration sample kit with 8 substances 400 mg each (Indium, Tin, Bismuth, Zinc, Aluminum, Silver, Gold, Nickel) for DSC DTA calibration of enthalpy and temperature
- (ii) Set of standard samples for calibration measurements (Cp or sensitivity enthalpy), with purity certificate.
- (iii) Sample preparation set for high temperature range, appropriate for STA
- (iv) Mass flow controller for accurate gas flow ranging from 0 to 200 ml min
- (v) Sample crucible from Al<sub>2</sub>O<sub>3</sub> 99.7, 0.3 ml (or nearest capacity) set of 100 pieces with appropriate lids (mandatory)
- (vi) Matched pair of sample cups for DSC in sets of 5 pairs made of Pt with lids for 100 micro liter or nearest sample capacity (mandatory)
- (i) Reference standard for calibration (01 set for low temp. and 01 set for high temp.)
- (ii) High end Desktop PC with MS Windows 7 OS

- (iii) Common tools and essential spares (such as each type of O rings, ferrule, nuts, bolts, ranges, PTFE SS gas tube between system and cylinders etc.) necessary for servicing or trouble shooting have to be supplied for a period of three years operation.
- (iv) Double stage SS regulators, connectors, has to be supplied by the supplier of the instrument and those have to be connected and integrated with the main unit. Capacity of the regulator and gas flow meter should comply with the desired gas flow rate as stated in the specification
- (v) Sensor stand 01 no.
- (vi) Tool kit for TG DSC crucibles for reshaping of crucible and crucible lids

Optional: low temperature option down to - -170 degree C

Note:

1. The complete job involves supply, installation, commissioning and training of the equipment and all accessories as above.
2. Minimum 5 number of supply and installation of simultaneous thermal analysis couple with mass spectrometer should have been carried out in India for considering the bid.
3. All machine manuals and software to be supplied with media hardcopy.
4. Bidder should submit (a) all original product brochures and technical literature with detailed machine specifications
5. Training at customer site for 4 to 5 days to be provided.
6. The Instrument should be supplied along with Branded Latest PC with configuration which should be compatible with the instrument
7. Service Support, Factory trained Engineers, specify the no. of Engineers with base location, Response time, Availability of Parts, Consumables, Warranty, AMC costs with no. of visits needs to be provided
8. Warranty: Three years Comprehensive Warranty from the date of installation on the complete system, including all the subsystems. In case of breakdown during the warranty period, a competent service engineer of the supplier should make as many visits as necessary to rectify the problem and replace the faulty parts. But it should be repaired within 72 working hours from the date and time of complaint lodged by the user. The supplier should provide all spares required for making the instrument operational
9. Spares: The supplier of the instrument must confirm in writing that the spares for the entire instrument will be available for a period of at least 13 years after the installation of the instrument.
10. User list with contacts: Vendor should provide us a list of installations in India with all contact details and model details and modules available, so that ARCI can approach the contact person for any feedback.
11. Quote must have a compliance report on all the above points.



Evaluation and Acceptance Criteria:

The supplier shall demonstrate satisfactorily the functioning of the equipment with respect to the following technical specifications during factory acceptance test as well on site test.

1. Maximum furnace temperature 1600 C.
2. Resolution of TG balance:
3. Data acquisition, storage and analysis shall be demonstrated
4. TGA mode: Temperature calibration using melting point standards such as Ag and Au shall be demonstrated.
5. TG DTA: temperature calibration up to 1600 C
6. TG DSC: temperature calibration up to 1600 C shall be demonstrated.
7. TG EGA (QMS): TG DSC EGA (QMS): TG DTA EGA (QMS): Calibration and demonstration of decomposition of Calcium Oxalate monohydrate, (CaC<sub>2</sub>O<sub>4</sub>.H<sub>2</sub>O) three steps (loss of water, loss of carbon monoxide and loss of carbon dioxide). Correspondingly, the trend data from the mass spectrometer to determine the amount of evolved gases for low mass to charge (m per e) ratio species such as water and carbon dioxide shall be demonstrated.
8. The sensitivity of QMS should be demonstrated for residual gas
9. The Kinetics of decomposition of CuSO<sub>4</sub>. 5 H<sub>2</sub>O and CaSO<sub>4</sub>. 2H<sub>2</sub>O up to the formation of Cu<sub>2</sub>O and CaO respectively in inert environment by carrying out TG DTA runs at the heating rates of 5, 10 and 20 K min. and analyzing the evolved gases should be carried out to ascertain the capabilities and performance of the system.
10. Blank run up to 1600 degree C with heating/cooling rate of 5 degree/min

**Supply of the materials, demonstration, installation and services must be done at:**

**Centre for Automotive Energy Materials (CAEM), International Advanced Research Centre for Powder Metallurgy and New Materials (ARCI), IIT-M Research Park, Phase-1, 7<sup>th</sup> Floor, Section B, 6 Kanagam Road, Taramani, Chennai 600 113, Tamil Nadu, India.**

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## CHECK LIST

**BIDDER HAS TO FILL IN THE CHECK LIST GIVEN BELOW**

**(Following documents are to be submitted online and manual as part of Technical Bid.  
Bidders are requested to state Yes / No against each column)**

Sl. No.	Description	Online Submission	Manual Submission
1.	If bidder is not an original equipment manufacturer, authorization letter attached.		
2.	Whether Earnest Money Deposit (EMD) Submitted		
3.	Whether Technical Bid Submitted		
4.	Whether Commercial Bid Submitted		
5.	PAN / GSTIN Number from concerned authorities		
6.	Details of Products and Components		
7.	Whether declaration form signed and Submitted (Scanned Copy by online and original by manual)		
8.	Whether warranty clause mentioned		
9.	This Checklist (Scanned Copy by online and original by manual)		
10.	Whether all pages of tender document signed and uploaded		

**NOTE:** Please ensure all the relevant boxes are marked YES/NO against each column.

**IMPORTANT NOTE:** Tenderers must ensure that all the required documents indicated in the Tender documents are submitted without fail. Tenders received without supporting documents for the various requirements mentioned in the tender document are liable to be rejected at the initial stage itself.