

e-Tender Document for

Supply and Installation of *Machineries /*

Equipment

at

CIPET: SARP- LARPM, Bhubaneswar



TENDER DOCUMENT NO. 05/2019-20

LAST DATE FOR SUBMISSION OF BID: 29.01.2020

SCHOOL FOR ADVANCED RESEARCH IN POLYMERS (SARP) - LARPM
CENTRAL INSTITUTE OF PLASTICS ENGINEERING & TECHNOLOGY
(Ministry of Chemicals & Fertilizer, Govt. of India)
B-25, C.N.I. Complex, Patia, Bhubaneswar – 751 024 (Odisha)
Tel: 0674-2740173, Fax: 0674-2740463,
Web: cipet.gov.in, e-mail : larpmcipet@larpm.in



SCHOOL FOR ADVANCED RESEARCH IN POLYMERS (SARP) - LARPM
CENTRAL INSTITUTE OF PLASTICS ENGINEERING & TECHNOLOGY
(Dept. of Chemicals & Petrochemicals, Ministry of Chemicals & Fertilizer, Govt. of India)
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Tel: 2740173, Fax: 0674-2740463
Email : larpmcipet@larpm.in



e-TENDER NOTICE (05/2019-20)

CIPET: SARP-LARPM, Bhubaneswar invites bids through e-Tender **UNDER SINGLE STAGE TWO BIDS SYSTEM IN e-TENDER PORTAL (www.tenderwizard.com/CIPET)** from Reputed Suppliers/ Manufacturers / Authorized Dealer & Distributors having valid PAN, IT Return & GST Registration Certificate for supply & installation of the following equipment at CIPET: SARP-LARPM, Bhubaneswar. Bid offers should be of two parts viz., Technical Bid & Commercial Bid.

Sl. No.	Name of the Equipments	Tender No.
1.	DC Poling Unit (Corona)	05/2019-20
2.	Potentiostat/Galvanostat (Electrochemical Workstation With Impedance Spectroscopy System With Multichannel Chassis)	
3.	Electrometer	
4.	High Temperature Furnace with Gas facility (Programmable Dual Zone/Sliding Tube Furnace)	
5.	Blown film Plant (Monolayer extrusion machine)	

Bidders are requested to visit the web-site www.tenderwizard.com/CIPET or www.cipet.gov.in and submit their offers electronically. It may be noted that offers submitted on paper manually or the offers sent by post shall not be entertained. The last date for submission of the bid is as mentioned below:

Last date for the online submission of the bid : 31.01.2020, 03.00 P.M.

Opening of Technical bid : 31.01.2020, 03.30 P.M.

Opening of Commercial bid : After Evaluation of Technical Bid

For further clarification, please contact no. 0674-2740173

CIPET:SARP-LARPM reserves the absolute right to accept/reject any or all bids at any stage of the tender process without assigning any reason whatsoever.

Officer (PAF), CIPET:SARP-LARPM

INSTRUCTIONS TO BIDDERS

(A) Introduction

School for Advanced in Research (SARP) - LARPM is an exclusive R&D wing of CIPET functioning at Bhubaneswar. SARP-LARPM was set up with an objective of developing high-end polymeric materials for various engineering applications in the areas of packaging, automotives, aerospace, defence, biomedical, energy conversion and energy storage etc. The laboratory has high-end characterization facility and basic amenities under one roof, for Researchers and Intellectuals working in the areas of Polymer Science & Technology. The laboratory is also recognized by National Accreditation Board for Testing and Calibration Laboratories (NABL) as per ISO:IEC 17025:2005 and DST / DSIR, Govt. of India for undertaking Research Activities in applied areas of Polymer Science & Technology.

(B) The Bidding Documents

- **Content of Bidding Documents**

The Bidding Documents include;

- (a) Instruction to Bidders;
- (b) Terms and Conditions of Contract;
- (c) Schedule of Requirements;
- (d) Technical Specifications & Compliance Sheets;
- (e) Manufacturer's Authorization Form;
- (f) Bid Form and Price Schedules;
- (g) Contract Form;
- (h) Performance Security Form;
- (i) Deviation Statement;

- The Bidder is expected to examine all instructions, forms, terms and specifications in the Bidding Documents. Failure to furnish all information required by the Bidding Documents or submission of a bid not substantially responsive to the Bidding Documents in every respect will be at the Bidder's risk and may result in rejection of the bid.

- **Amendment of Bidding Documents:**

- At any time prior to the deadline for submission of bids, the Purchaser may, for any reason, whether at their own initiative or in response to a clarification requested by a prospective bidder, modify the Bidding Documents by amendment.
- In order to afford prospective Bidders reasonable time in which to take the amendment into account in preparing their bid, the Purchaser may, at their discretion, extend the deadline for the submission of bids

(C) Eligible Criteria for Bidders :

- Audited Balance sheet for the last 3 years
- Up-to-date IT return for the last 3 years, PAN Card, GST Registration Certificate.
- The Bidders must have satisfactorily supplied & completed installation of similar type of Instrument at-least 02 nos. in any Govt. Organisations/PSU/Corporate Sectors during the last 5 years. The Certificate in support of that from the user must be attached. The Customer Feed Back Certificate must be enclosed.
- Self-declaration on **NO PENDING LITIGATION.**

- The vendor shall have local service and application office and infrastructure to attend visit within 48 hours.
- The vendor should furnish details of customers in India.
- The bidders shall give a list of his relatives working with the CIPET along with their designations and addresses.

(D) Terms & Conditions :

- **Taxes:** All taxes, duties, packing, forwarding & installation have been included in the quoted rate. ***GST should be charged 5% only, since CIPET is having DSIR certificate.***
- **Performance Security:** 10% of the Purchase Order value shall be submitted by the party towards performance security within 7 days of receipt of Purchase Order in the form of Demand Draft. The Performance Security will be refunded after warranty period is over.
- **Warranty:** The Instrument should be covered under 1 year warranty from the date of installation and commissioning with maintenance must be provided in order to keep the equipment in continuous working condition. Part numbers of all parts for which warranty will not be applicable should be specified in the quotation
- **Delivery Period:** Supplier should be delivered the instrument within 4-6 weeks from the date of receipt of Purchase Order, failing which liquidated damage @ 0.5% per week shall be deducted from the final payment, for each week of delay beyond the delivery period upto maximum of 2%.
- **Payment:** 90% after supply of Instrument & balance 10% after successful installation, commissioning & Training as per our Technical Specifications & subject to fulfilment of other terms & conditions of the e-Tender documents.
- The Bidder shall provide the Bank accounts details along with Scanned copy of cancelled cheque for onward transaction.
- The vendor should have technical support in the area of application and service available within the country.
- In case of any up-gradation of software then the same should be provided free of cost by the supplier/manufacturer.
- Power and receptacle/socket as per Indian Standards should be provided.
- Appropriate tool box/kit for routine maintenance should be provided with the equipment
- On-site (at SARP-LARPM, Bhubaneswar) installation, demonstration and training for system operation and maintenance as well as application support should be provided by the vendor at its own cost.
- Tenders should specify & provide all mandatory and other accessories required for installation, commissioning and running the machine.
- The repairing/rectification/replacement/configuration required, if any, of the items under warranty must be done at CIPET:SARP-LARPM, Bhubaneswar by the bidder.

- The Annual Maintenance Charges (AMC) 3 Years should be quoted separately (Optional), which should not be quoted in the Price Bid.
- The supplier should mention the model & make against the Instrument.
- **Spares:** The supplier must confirm in writing that the spares for the instrument will be available for a period of at least 05 (Five) years after the Instrument supplied.
- **Bid document:** The vendor should read the e-Tender documents carefully before quoting. It shall be deemed that the vendor has gone through the documents carefully and has understood its implication.
- **Technical bid:** The Technical Bid should accompany with full technical literature, leaflets of the technical features of the Instrument must be submitted for evaluation.
- **Declaration:** The bidder should attach a self-declaration statement that he is not debarred/ blacklisted or banned from any Central Government / PSU / State Govt / any Corporate Sector.
- **Manual:** Complete set of service manual for diagnostics, trouble shooting and maintenance along with electronic circuit diagram (in English) – hard and soft copy should be provided with the instrument
- The e-Tender, submitted by the Bidder who have already been declared as Black Listed or whose contract was terminated for dissatisfactory supply or who was unable to supply any Institute/Organization run by the State / Central Government / PSU / Corporate Sectors will not be considered even his being the lowest rate.
- The Bidder should provide relevant documents regarding the Partnership Firm/Public/Pvt. Ltd. Company/Cooperative society.

Pre-Requisites

- Pre-installation requirements indicating details of power requirement, utility air, water, ventilation, safety device, if any, along with the foundation requirement needed for installation & commissioning should be provided prior to supply of Machine.
- Appropriate tool box/kit for routine maintenance should be provided with the equipment
- All documents (i.e. operating & service manuals, drawings etc.) and original softwares relevant to the instrument and its accessories must be supplied.
- Power and receptacle/socket as per Indian Standards should be provided.
- The vendor shall attend by visit within 48 hours of need.

Training

- Training at vendor site and onsite for system operation and maintenance as well as application support should be provided by the vendor at its own cost.

- Prices quoted should be on Delivered Duty Paid (DDP) basis to CIPET:SARP-LARPM, Bhubaneswar.
- Any legal disputes subject to Bhubaneswar, India jurisdiction only
- **Delivery and Documents**

(a) For Imported Goods

- Original and three copies of Supplier's invoice showing Goods description, quantity, unit price, total amount.
- Original and three copies of the negotiable clean, on –board bill of lading marked freight prepaid and three copies of non-negotiable bill of lading.
- Five Copies of packing list identifying contents of each package.
- Insurance Certificate.
- Manufacturer's /Supplier's guaranty certificate.
- Traceable Calibration Certificate issued by Accredited Calibration agency and
- Certificate of Origin.

(b) For Domestic Goods:

Original and Three copies of:

- Copies of the Supplier invoice showing Goods description, quantity, unit price, total amount.
- Railway receipt /Acknowledgement of receipt of goods from the consignee(s);
- Manufacturer's /Supplier's guarantee Certificate;
- Traceable Calibration Certificate issued by Accredited Calibration agency,
- Certificate of origin and
- Document evidence for GST Registration /Octroi etc., wherever applicable, bearing seal of office of issue indicating payments made extra.

The above documents shall be received by the Purchaser before arrival of the goods (except where the goods have been delivered directly to the consignee with all documents) and if not received, the supplier will be responsible for any consequent expenses.

• **Warranty/Guarantee**

- The Supplier warrants that the Goods supplied under this Contract are new, unused, of the most recent or current models and incorporate all recent improvements in design and materials unless provided otherwise in the Contract. The Supplier further warrants that the Goods supplied under this Contract shall have no defect arising from design, materials or workmanship (except insofar as the design or material is required by the Purchaser's Specifications) or from any act or omission of the supplier, that may develop under normal use of the supplied Goods in conditions obtaining in the country of final destination.
- This warranty/guarantee shall remain valid for 12 months after the Goods or any portion thereof as the case may be, have been delivered and Commissioned at the final destination indicated in the Contract.
- The Purchaser shall promptly notify the Supplier, in writing, of any claims arising under this warranty.

- Upon receipt of such notice, the Supplier shall, with all reasonable speed, repair or replace the defective Goods or parts thereof, without cost to the Purchaser.
- If the Supplier, having been notified, fails to remedy the defect(s) within a reasonable period, the Purchaser may proceed to take such remedial action as may be necessary, at the Supplier's risk and expense and without prejudice to any other rights which the Purchaser may have against the Supplier under the Contract.
- The Supplier must provide the following warranties:
 - (a) The equipment proposed is Complete in every way
 - (b) The hardware/software specification, Capabilities and performance characteristics are as stated in the bidder's proposal and accompanying documentation.
 - (c) The supplier will offer to the Purchaser all technological updates, cost reductions and facilities, which are offered to other clients, in India, during the Contract tenure.

If the supplier is acting directly for the manufacturer of the Goods and Services, the Manufacturer must honor these guarantee.

The MAINTENANCE SERVICE shall be as follows.

- (a) Free maintenance services shall be provided by the Supplier during the period of warranty.
- (b) The maximum response time for maintenance complaint from any of the destination specified in the Schedule of requirements (i.e. time required for supplier's maintenance engineer to report at the installation after a request call/email is made or letter is written) shall not exceed 24 hours.

- **Liquidated Damages:-**

If the Supplier fails to deliver any or all of the goods within the time period(s) specified in the Contract, the Purchaser shall, without prejudice to its other remedies under the contract, deduct from the Contract Price, as liquidated damages, a sum equivalent @ 0.5% per week shall be deducted from the final payment, for each week of delay beyond the delivery period upto maximum of 2% of the delayed goods or services Contract price. Once the maximum is reached, the purchaser may consider termination of the contract

(E) Preparation of Bids

1. Bid Form

The Bidder shall complete the Bid Form and the appropriate Price Schedule furnished in the Bidding Documents, indicating for the goods to be supplied, a brief description of the Goods, their country of origin, quantity and prices

2. Agents and service facilities in India :

If a foreign bidder has engaged an Indian agent, it will be required to give the following details in the offer:

- (i) The name and address of the local agent;
- (ii) What service the agent renders; and
- (iii) The amount of remuneration for the agent included in the offer

3. Documents establishing Bidder's Eligibility and Qualifications

- The Bidder shall furnish, as part of its bid, documents establishing the bidder's eligibility to bid and its qualifications to perform the Contract if its bid is accepted.
- The documentary evidence of the Bidder's qualifications to perform the Contract if its bid is accepted, shall establish to the Purchaser's satisfaction:
 - (a) In the case of a Bidder offering to supply goods under the contract which the Bidder did not manufacture or otherwise produce, the Bidder has been duly authorized by the goods manufacturer or producer to supply the goods in India.
 - (b) In the case of a Bidder not doing business within India, the Bidder is or will be (if successfully represented by an agent in India) equipped and able to carry out the Supplier's maintenance, repair and spare-parts stocking obligations prescribed by the Conditions of the Contract and / or Technical Specifications
 - (c) The Bidder has the financial, technical, and production capability necessary to perform the Contract and meets the criteria outlined in the qualification criteria specified as per the Tender norms.

4. Period of Validity of Bids

- Bids shall remain valid for 120 days after the date of bid opening prescribed by the Purchaser. A bid valid for a shorter period may be rejected by the Purchaser as non-responsive.

5. Submission of Bids

- i) The detailed technical specification of the equipment is enclosed in Bid document, Offer should be of two parts Viz., "**TECHNICAL BID**" and "**COMMERCIAL BID**" The content of the both bids should be as under;

(a) TECHNICAL BID should include the following:-

- ✓ Detailed specification of the base equipment (Product Make & Model) along with the specification of accessories, which are included in the Base unit.
- ✓ Scope of supply
- ✓ Deviation Statement
- ✓ Product Literature/Brochure
- ✓ Proforma for Performance Statement
- ✓ Qualification Criteria
- ✓ List of spare parts included (without quoting the price) (the acceptance and rejection of spare parts will be at sole discretion of CIPET:SARP-LARPM)
- ✓ List of optional accessories with their technical specification. (without quoting the price)
- ✓ Manufacturer's Authorization Form
- ✓ Bid Form
- ✓ Any other information which the bidder would like to state about the technically of the equipment.

(b) COMMERCIAL BID should include the following:-

- ✓ Statement showing the price of the each items of spare parts which is mentioned in the Technical Bid
- ✓ Conditional bids will not be accepted. The condition laid down by CIPET:SARP-LARPM is final and binding on all bidders.
- ✓ The quote should be in Indian Currency (INR).
- ✓ CIPET:SARP-LARPM reserves the right to accept or reject any or all tenders either in part or in full without assigning any reasons thereof.

The bids, which are not containing the statements, mentioned in 5 (i) (a) & (b) are liable to be rejected.

- The proforma of Annexures in the Bidding document, wherever necessary, should be typed on the bidder's letter head and upload the same.
- Price Schedule should be submitted in the prescribed format given under price schedule of the Bidding Document.
- The Deviation Statement enclosed should be duly filled in and submitted along with Bidding Document. If the bidder is offering more than one options/models a separate Deviation statement for each of such quotes should be submitted along with the offer.
- Quotes received without price schedule and deviation statement as per our prescribed format, will summarily be rejected.
- Relaxation of Norms for Startup and Micro & Small Enterprises in Public Procurement on Prior Experience – Prior Turnover Criteria.

6. Deadline for Submission of Bids

The Purchaser may, at its discretion, extend this deadline for submission of bids by amending the Bid Documents, in which case all rights and obligations of the Purchaser and Bidders previously subject to the deadline will thereafter be subject to the dead-line as extended.

7. Evaluation and Comparison of Bids

- The Purchaser will evaluate and compare the bids previously determined to be substantially responsive.
- The availability in India of spare parts and after-sales services for the equipment offered (imported goods) – in the bid; (the inclusion of cost of spare parts for comparison as per requirement will be at sole discretion of CIPET:SARP-LARPM. Also, CIPET:SARP-LARPM reserves right to accept any bid and to reject any bid or all bids.

(F) Award of Contract

• Post Qualification

- The Purchaser will determine to its satisfaction whether the Bidder selected as having submitted the lowest evaluated responsive bid is qualified to satisfactorily perform the Contract.
- The determination will take into account the Bidder's financial, technical and production capabilities. It will be based upon an examination of the documentary evidence of the Bidder's qualifications submitted by the Bidder as well as such other information as the Purchaser deems necessary and appropriate.
- An Affirmative determination will be a prerequisite for award of the Contract to the Bidder. A negative determination will result in rejection of the Bidder's bid.

• Purchaser's right to vary Quantities at Time of Award

- The Purchaser reserves the right at the time of award of Contract to increase or decrease of the quantity of goods and services specified in the Schedule of Requirements without any change in price or other terms and conditions.

• Purchaser's Right to Accept any Bid and to Reject Any or All Bids

- The Purchaser reserves the right to accept or reject any bid, and to annul the bidding process and reject all bids at any time prior to award of Contract, without thereby incurring any liability to the affected Bidder or Bidders or any obligation to inform the affected Bidders or Bidders of the grounds for the purchaser's action.

MANUFACTURER'S AUTHORIZATION FORM

No.....dated.....

To
School for Advanced Research in Polymers – LARPM,
CIPET, B-25,C.N.I Complex, P.O: KIIT, Patia,
Bhubaneswar-751024, India.

Dear Sir
Ref: Bid Reference

We who are established and reputable
manufacturers ofhaving factories at
.....and.....do hereby authorize
M/s.....
M/s.....
M/s.....etc (Name and
address of Agents) to bid and conclude the contract with you against the above Bid are authorized
to bid and conclude the contract in regard to this business against this specific Bid.

We hereby extend our full guarantee and warranty as per the Terms and Conditions of Contract for
the goods offered for supply against this invitation for bid by the above firms.

Yours Faithfully,

(Name)
for and on behalf of M/s.....
(Name of Manufactures)

Note: This letter of authority should be on the letterhead of the manufacturing concern and should
be signed by a person competent and having the power of attorney to bind the manufacturer

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probe • perform • practice • Plastics

PROFORMA FOR PERFORMANCE STATEMENT

(for Simple Goods/equipment for a period of last three years)

Bid No.....Date of opening.....Time.....Hours

Name of the Firm.....

Order placed By	Order No and date	Description and quantity of ordered equipment	Value of order	Date of completion of delivery		Remarks indicating reasons for late delivery, if any	Has the equipment been satisfactorily functioning?
(Full address of Purchaser)				As per Contract	Actual		
1	2	3	4	5	6	7	8

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Signature and seal of the Bidder

PROFORMA FOR DEVIATION STATEMENT

Bid Ref No.

Date of Opening

Time :

Name of the Firm

Name of the Equipment quoted

Model No.:

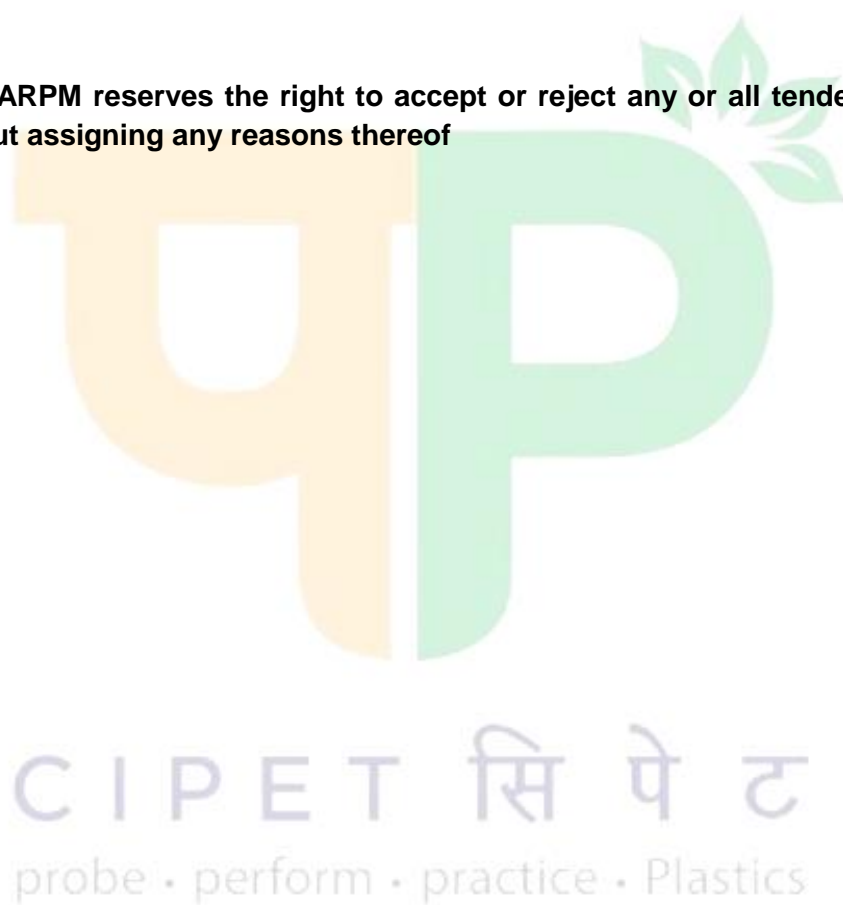
Purchaser's Specification	Bidders Specification	Deviation, if any	Justification	Remarks

Note : Separate Deviation statements should be submitted along with the bid for all models / alternative quotes.

Note :- Further if any e-Tender queries please contact the following officials of e-tenderwizard:

Sl. No.	Name of the Official	Contact Number	e-mail ID
01.	Mr. S.K. Mohapatra	7377708585	twhelpdesk404@gmail.com
02.	Mr. Swades Kumar Bal	7008064095	twhelpdesk404@gmail.com

CIPET:SARP-LARPM reserves the right to accept or reject any or all tenders either in part or in full without assigning any reasons thereof



Name	1. DC POLING UNIT (CORONA)
Quantity	01

Corona poling unit along with accessories required to performing high voltage corona poling experiments.

Make	Bidder to specify
Model	Bidder to specify
50 kV DC High Voltage Power Supply for Corona Poling (Needle)	<ul style="list-style-type: none"> • Current: 1 mA output [max] • Based on high frequency push pull inverter along with voltage multiplier circuit • Separate analogue indication for voltage and current • High voltage floating output cable • Closed loop voltage regulation • Continuous voltage control from 10kV – 50kV • Digital indications for voltage, current and temperature.
Pin Holder Assembly	<ul style="list-style-type: none"> • Pin holder assembly at least 4 nos. of pins or more • Pin material – Tungsten or other • Delrin based isolation.
Sample Heating option with Heater	<ul style="list-style-type: none"> • Suitable sample heating plate with isolated heater assembly • Sample heating size of 2"x 2" or better. • Closed loop temperature control consisting of: <ul style="list-style-type: none"> (i) Phase Angle Type Thyristor Power Controller for Heater and PID Controller with Fuzzy logic and Digital Display for Temperature. (ii) Temperature range from room temperature to 200°C.
Stand and Cover	<ul style="list-style-type: none"> • Fully engineered stand with adjustable height to accommodate pin holder assembly, sample heater plate with proper insulation • Acrylic cover with door interlock [for Power Supply] for operator safety
Automation	PLC-HMI based Automation consisting of <ul style="list-style-type: none"> • Colour touch screen based HMI with system MIMIC and indication of high voltage and current • PLC with digital and analogue inputs for interlocks and current and voltage
Grid Assembly	<ul style="list-style-type: none"> • SS mesh • Isolated by Delrin insulation. • Adjustable distance from pin assembly
Accessories: Grid Power Supply	<ul style="list-style-type: none"> • 25 kV DC power supply • 2-25kV variable • 2mA (max) current. • Digital display of voltage and current. • Short circuit protection / trip • Power ON reset.

TECHNICAL COMPLIANCE SHEET

Parameters	Details	Compliance
Make	Bidder to specify	
Model	Bidder to specify	
50 kV DC High Voltage Power Supply for Corona Poling (Needle)	<ul style="list-style-type: none"> Current: 1 mA output [max] Based on high frequency push pull inverter along with voltage multiplier circuit Separate analogue indication for voltage and current High voltage floating output cable Closed loop voltage regulation Continuous voltage control from 10kV – 50kV Digital indications for voltage, current and temperature. 	
Pin Holder Assembly	<ul style="list-style-type: none"> Pin holder assembly at least 4 nos. of pins or more Pin material – Tungsten or other Delrin based isolation. 	
Sample Heating option with Heater	<ul style="list-style-type: none"> Suitable sample heating plate with isolated heater assembly Sample heating size of 2"x 2" or better. Closed loop temperature control consisting of: <ol style="list-style-type: none"> Phase Angle Type Thyristor Power Controller for Heater and PID Controller with Fuzzy logic and Digital Display of Temperature. Temperature range from room temperature to 200°C. 	
Stand and Cover	<ul style="list-style-type: none"> Fully engineered stand with adjustable height to accommodate pin holder assembly, sample heater plate with proper insulation Acrylic cover with door interlock [for Power Supply] for operator safety 	
Automation	PLC-HMI based Automation consisting of <ul style="list-style-type: none"> Colour touch screen based HMI with system MIMIC and indication of high voltage and current PLC with digital and analogue inputs for interlocks and current and voltage 	
Grid Assembly	<ul style="list-style-type: none"> SS mesh Isolated by Delrin insulation. Adjustable distance from pin assembly 	
Accessories: Grid Power Supply	<ul style="list-style-type: none"> 25 kV DC power supply 2-25kV variable 2mA (max) current. Digital display of voltage and current. Short circuit protection / trip Power ON reset. 	

NAME	:	2. POTENTIOSTAT/GALVANOSTAT (ELECTROCHEMICAL WORKSTATION WITH IMPEDANCE SPECTROSCOPY SYSTEM WITH MULTICHANNEL CHASSIS)
QUANTITY	:	01 No.

TECHNICAL SPECIFICATION

- Bi-Potentiostat/Galvanostat/EIS analyzer designed for electrochemical research over a broad spectrum of applications.
- Both channels should be electrically isolated; floating ground and should operate in single cell-multiple working electrode combination.

Make	Bidder to specify
Model	Bidder to specify
Application Includes	Battery, Supercapacitors, Photovoltaic & solar cell test, Fuel cell & Biofuel cell test, Corrosion & Coatings, EIS, Electrochroms, Sensors, Photoelectrochemistry, Fundamental Electrochemistry, Electrodeposition, Electroanalysis, Electrosynthesis,
No. of channels required	2 channels for Bi-Potentiostat facility/ Multichannel Facility
Compliance voltage	±12V or better
Applied Potential range	±10V or better
Current Ranges	±10nA to ±1A
Applied Current	±10nA to ±500mA or more
EIS	One channel should have 10μHz-6MHz or more
Voltage Resolution	1μV or better
Voltage Accuracy	±0.1% FSR or better
Current Resolution	Should be 760 fA or better
Current Accuracy	±0.1% FSR or better
Acquisition speed/ Data Sampling	1,000,000 samples/second or better
AC Amplitude	0.5mV to 2V
Bandwidth of electrometer	8 MHz or better
Input Impedance	1TΩ
Cell connection/Electrode Configuration	2, 3, 4 Terminal Leads (+ ground)
<ul style="list-style-type: none"> • Floating Mode facility should be available • Grounded Mode facility should be available 	
Auxiliary inputs/outputs	<ul style="list-style-type: none"> • 2 Analog Inputs and 1 Analog Output, to control external accessories like RRDE, Temperature Probe, Temperature and Humidity Chambers, etc. 1 Digital Inputs and 1 Digital Output should be available.
Calibration Board	<ul style="list-style-type: none"> • Calibration of Potentiostat channel with cables should be available on-site and calibration reports must be printed as on when required.

Interface	Ethernet LAN /USB
<u>Software's required</u>	<ul style="list-style-type: none"> • Fundamental Electrochemistry – OCV, CV, LSV, Batteries, supercapacitors, Fuel cell/photovoltaic testing Techniques. • GEIS, PEIS -Electrochemical Impedance Spectroscopy Technique. • Corrosion software including LPR, Tafel, etc. • Pulse software including DPV, NPV, RNPV, SWV, etc. • Equivalent EIS fitting circuit software. • Analysis tools for Corrosion Rp and Tafel Fit, battery CED fit. • 3D View should be available • Should include Drift Correction in the EIS Technique which corrects the drift of the system. It needs to be used when the system has not reached its steady-state regime (specifically for low frequencies measurements). • Should include EIS Quality Indicators for an Impedance experiment validation and should fulfill various requirements for THD (Total Harmonic Distortion), NSD (Non-Stationary Distortion) and NSR (Noise to Signal Ratio). • OEM Package and Lab View drivers should be available.
Accessories.	<ul style="list-style-type: none"> • Ag/AgCl reference electrode: 2 No. Should be supplied. • Pt Counter Electrode: 2 No. Should be supplied. • Alligator clips-10 Nos • Compatible Cell kit (with gas purging option) for the above Electrodes.

TECHNICAL COMPLIANCE SHEET

Parameters	Details	Compliance
Make	Bidder to specify	
Model	Bidder to specify	
Application Includes	Battery, Supercapacitors, Photovoltaic & solar cell test, Fuel cell & Biofuel cell test, Corrosion & Coatings, EIS, Electrochroms, Sensors, Photoelectrochemistry, Fundamental Electrochemistry, Electrodeposition, Electroanalysis, Electrosynthesis,	
No. of channels required	2 channels for Bi-Potentiostat facility/ Multichannel Facility	
Compliance voltage	$\pm 12\text{V}$ or better	
Applied Potential range	$\pm 10\text{V}$ or better	
Current Ranges	$\pm 10\text{nA}$ to $\pm 1\text{A}$	
Applied Current	$\pm 10\text{nA}$ to $\pm 500\text{mA}$ or more	
EIS	One channel should have $10\mu\text{Hz}$ - 6MHz or more	
Voltage Resolution	$1\mu\text{V}$ or better	
Voltage Accuracy	$\pm 0.1\%$ FSR or better	
Current Resolution	Should be 760 fA or better	
Current Accuracy	$\pm 0.1\%$ FSR or better	
Acquisition speed/ Data Sampling	1,000,000 samples/second or better	
AC Amplitude	0.5mV to 2V	
Bandwidth of electrometer	8 MHz or better	
Input Impedance	$1\text{T}\Omega$	
Cell connection/Electrode Configuration	2, 3, 4 Terminal Leads (+ ground)	
	<ul style="list-style-type: none"> Floating Mode facility should be available Grounded Mode facility should be available 	
Auxiliary inputs/outputs	<ul style="list-style-type: none"> 2 Analog Inputs and 1 Analog Output, to control external accessories like RRDE, Temperature Probe, Temperature and Humidity Chambers, etc. 1 Digital Inputs and 1 Digital Output should be available. 	
Calibration Board	<ul style="list-style-type: none"> Calibration of Potentiostat channel with cables should be available on-site and calibration reports must be printed as on when required. 	
Interface	Ethernet LAN /USB	
<u>Software's required</u>	<ul style="list-style-type: none"> Fundamental Electrochemistry – OCV, CV, LSV, Batteries, supercapacitors, Fuel cell/photovoltaic testing 	

	<p>Techniques.</p> <ul style="list-style-type: none"> • GEIS, PEIS -Electrochemical Impedance Spectroscopy Technique. • Corrosion software including LPR, Tafel, etc. • Pulse software including DPV, NPV, RNPV, SWV, etc. • Equivalent EIS fitting circuit software. • Analysis tools for Corrosion Rp and Tafel Fit, battery CED fit. • 3D View should be available • Should include Drift Correction in the EIS Technique which corrects the drift of the system. It needs to be used when the system has not reached its steady-state regime (specifically for low frequencies measurements). • Should include EIS Quality Indicators for an Impedance experiment validation and should fulfill various requirements for THD (Total Harmonic Distortion), NSD (Non-Stationary Distortion) and NSR (Noise to Signal Ratio). • OEM Package and Lab View drivers should be available. 	
Accessories.	<ul style="list-style-type: none"> • Ag/AgCl reference electrode: 2 No. Should be supplied. • Pt Counter Electrode: 2 No. Should be supplied. • Alligator clips-10 Nos • Compatible Cell kit (with gas purging option) for the above Electrodes. 	

NAME	:	3. ELECTROMETER
QUANTITY	:	01 No.

Make	Bidder to specify
Model	Bidder to specify
Function	Current, Voltage, Resistance and Charge measurement
Voltage range	2 V-200 V or better
Current range	20 pA-20 mA or better
Resistance range	2 kΩ- 200 GΩ
Noise level	< 1 fA or better
Impedance for Voltage measurement	200 TΩ or more
Charge measurement range	10 fC to 20 μC or better
Data reading speed	High speed - up to 1200 readings/second or better
DMM Connectivity	GPIB, RS232, USB
Digit resolution	5.5 or better
Cables & USB connector	<ul style="list-style-type: none"> • Low Noise Cable with Alligator Clips (3-Slot) • NI - USB-to-GPIB Interface Adapter
Safety	Overflow indication
Operational Condition	Operating: 0°–50°C; relative humidity 70% non-condensing, up to 35°C. Storage: –25° to +65°C
Voltage	AC 220V Single Phase, 50/60 Hz
Software	Necessary software for measuring I-V, I-t, V-t, etc., through computer
<ul style="list-style-type: none"> • Interfaces readily with switches, computers, and component handlers Cancels voltage and current offsets easily. • Current sensitivity, coupled with low-voltage burden. • Photodiode dark-current measurements. 	

TECHNICAL COMPLIANCE SHEET

Parameters	Details	Compliance
Make	Bidder to specify	
Model	Bidder to specify	
Function	Current, Voltage, Resistance and Charge measurement	
Voltage range	2 V-200 V or better	
Current range	20 pA-20 mA or better	
Resistance range	2 k Ω - 200 G Ω	
Noise level	< 1 fA or better	
Impedance for Voltage measurement	200 T Ω or more	
Charge measurement range	10 fC to 20 μ C or better	
Data reading speed	High speed - up to 1200 readings/second or better	
DMM Connectivity	GPIO, RS232, USB	
Digit resolution	5.5 or better	
Cables & USB connector	<ul style="list-style-type: none"> Low Noise Cable with Alligator Clips (3-Slot) NI - USB-to-GPIO Interface 	
Safety	Overflow indication	
Operational Condition	Operating: 0°–50°C; relative humidity 70% non-condensing, up to 35°C. Storage: –25° to +65°C	
Voltage	AC 220V Single Phase, 50/60 Hz	
Software	Necessary software for measuring I-V, I-t, V-t, etc., through computer	
<ul style="list-style-type: none"> Interfaces readily with switches, computers, and component handlers Cancels voltage and current offsets easily. Current sensitivity, coupled with low-voltage burden. Photodiode dark-current measurements. 		

NAME	:	4. High Temperature Furnace with Gas Facility (Programmable Zone/Sliding Tube Furnace) Dual
QUANTITY	:	01 No.

Make	Bidder to specify
Model	Bidder to specify
Purpose	Synthesis of various 2D materials & high temperature annealing at ambient air/vacuum and various atmospheres.
Furnace Structure	<ul style="list-style-type: none"> • Double sliding rail made by Cr-plated steel. • Both furnaces are double layer steel structure with 1200°C max. working temperature.
Max. Temperature	1200 °C or more
Operational Temperature	1100 °C
Heating Rate	0.5 – 20°C/min or more
Temperature Accuracy	+/- 1°C or better
Tube Material/ Size	High purity fused quartz tube (03 Nos) / Size: Diameter: 50 mm; Length: 1400 mm or above 4 fibrous ceramic tube blocks
Dimension	Total:1600 x 430 x 500 mm or above (furnaces with sliding)
No of Heating Zone	2
Total required Heating Zone Length	8" or more for each zone
Heating Elements	Fe-Cr-Al Alloy doped by Mo
Thermocouple	K-type or better
Temperature Controller	<ul style="list-style-type: none"> • Two temperature controllers are built to control heating zone independently via K-type thermal couples • PID automatic control via solid state relay with 30 steps programmable • Built in Over Temperature and Thermocouple Failure Protection
Vacuum Flanges	Appropriate stainless steel vacuum flanges and vacuum sealing assembly with vacuum gauge
Vacuum pump/level	Mechanical pump, 10 ⁻³ torr or better
Fitting Ports	Sealing Flange Assembly according to tube size Sealing cascades with additional nos.
Vacuum pump	156 L/m Double Stage Rotary Vane Vacuum Pump with Exhaust Filter
Pressure Measurement & Monitoring	Standard mechanical vacuum gauge (-0.1 to 0.15Mpa)
Sliding Rails / Table	<ul style="list-style-type: none"> • Double sliding rail made by Cr-plated steel • Sliding length: 1200 mm or more • Two slide stopping clamps are included for holding the position of the furnaces.
Voltage	AC 240V Single Phase, 50/60 Hz, 20 A air breaker

	required
Power of furnace	2.5 KW in total
Warranty	1 year
Accessories	<ul style="list-style-type: none"> • O-rings • Alumina tube: Diameter: 50 mm; Length: 1400 mm • 4 fibrous ceramic tube blocks, provide additional tube • Vacuum flanges
Optional	Optional flange with a KF25 vacuum port and digital vacuum gauge

TECHNICAL COMPLIANCE SHEET

Parameters	Details	Compliance
Make	Bidder to specify	
Model	Bidder to specify	
Purpose	Synthesis of various 2D materials & high temperature annealing at ambient air/vacuum and various atmospheres.	
Furnace Structure	<ul style="list-style-type: none"> • Double sliding rail made by Cr-plated steel. • Both furnaces are double layer steel structure with 1200°C max. working temperature. 	
Max. Temperature	1200 °C or more	
Operational Temperature	1100 °C	
Heating Rate	0.5 – 20°C/min or more	
Temperature Accuracy	+/- 1°C or better	
Tube Material/ Size	High purity fused quartz tube (03 Nos) / Size: Diameter: 50 mm; Length: 1400 mm or above 4 fibrous ceramic tube blocks	
Dimension	Total:1600 x 430 x 500 mm or above (furnaces with sliding)	
No of Heating Zone	2	
Total required Heating Zone Length	8" or more for each zone	
Heating Elements	Fe-Cr-Al Alloy doped by Mo	
Thermocouple	K-type or better	

Temperature Controller	<ul style="list-style-type: none"> Two temperature controllers are built to control heating zone independently via K-type thermal couples PID automatic control via solid state relay with 30 steps programmable 	
Vacuum Flanges	Appropriate stainless steel vacuum flanges and vacuum sealing assembly with vacuum gauge	
Vacuum pump/level	Mechanical pump, 10^{-3} torr or better	
Fitting Ports	Sealing Flange Assembly according to tube size Sealing cascades with additional nos.	
Vacuum pump	156 L/m Double Stage Rotary Vane Vacuum Pump with Exhaust Filter	
Pressure Measurement & Monitoring	Standard mechanical vacuum gauge (-0.1 to 0.15Mpa)	
Sliding Rails / Table	<ul style="list-style-type: none"> Double sliding rail made by Cr-plated steel Sliding length: 1200 mm or more Two slide stopping clamps are included for holding the position of the furnaces. 	
Voltage	AC 240V Single Phase, 50/60 Hz, 20 A air breaker required	
Power of furnace	2.5 KW in total	
Warranty	1 year	
Accessories	<ul style="list-style-type: none"> O-rings Alumina tube: Diameter: 50 mm; Length: 1400 mm 4 fibrous ceramic tube blocks, provide additional tube Vacuum flanges 	
Optional	Optional flange with a KF25 vacuum port and digital vacuum gauge	

NAME	:	5. Blown Film Plant (Monolayer Extrusion Machine)
QUANTITY	:	01 No.

TECHNICAL SPECIFICATION

Parameters		Details
Screw diameter (mm)	:	35-40
Length Diameter Ratio	:	25:1
Screw RPM	:	40-80 RPM or equivalent
Temperature	:	80-300°C or better
Layflat width range (mm)	:	300-650
Max Film thickness LL/LD/HD/Bio-degradable polymers (micron)	:	20-150
Through put	:	25kg/hr or more
Main drive	:	7.5hp or as desired
Die	:	Spiral
Nip Roll	:	500-650mm
Winder	:	Single Station
Connected Load	:	As applicable
Other important features:		
<ul style="list-style-type: none"> Extruder should have a facility of controlling all temperature parameters. Gas nitride screw and barrel Helical gear box Spiral die AC drive for extruder and take-up Surface Winder Film embossing arrangement Adjustable screw RPM Air Blower for film cooling should be supplied with proper attachment/provision to control the temperature of the air used for cooling Candle filter Pneumatically operated film nip rolls with controls on sub cabinet. 		
Other Mandatory Items		<p>While supplying the Machines, the supplier should also provide the following items apart from above:</p> <ul style="list-style-type: none"> Hard copies of Operational & Service Manual- 01 Set . Machine should come with all other essential accessories & spares required for installation, commissioning& Operation.

TECHNICAL COMPLIANCE SHEET

Parameters		Details	Compliance
Screw diameter (mm)	:	35-40	
Length Diameter Ratio	:	25:1	
Screw RPM	:	40-80 RPM or equivalent	
Temperature	:	80-300°C or better	
Layflat width range (mm)	:	300-650	
Max Film thickness LL/LD/HD/Bio-degradable polymers (micron)	:	20-150	
Through put	:	25kg/hr or more	
Main drive	:	7.5hp or as desired	
Die	:	Spiral	
Nip Roll	:	500-650mm	
Winder	:	Single Station	
Connected Load	:	As applicable	
Other important features:			
<ul style="list-style-type: none"> Extruder should have a facility of controlling all temperature parameters. Gas nitride screw and barrel Helical gear box Spiral die AC drive for extruder and take-up Surface Winder Film embossing arrangement Adjustable screw RPM Air Blower for film cooling should be supplied with proper attachment/provision to control the temperature of the air used for cooling Candle filter Pneumatically operated film nip rolls with controls on sub cabinet. 			
Other Mandatory Items	While supplying the Machines, the supplier should also provide the following items apart from above:		

	<ul style="list-style-type: none"> • Hard copies of Operational & Service Manual- 01 Set . • Machine should come with all other essential accessories & spares required for installation, commissioning & Operation. 	
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