

**e-Tender Document for**  
**Supply, Installation & Commissioning of**  
***Machineries / Equipment***  
**at**  
**CIPET:SARP- LARPM, Bhubaneswar**



**TENDER DOCUMENT NO. 02/2018-19**  
probe · perform · practice · Plastics

**LAST DATE FOR SUBMISSION OF BID: 18.03.2019**

**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](http://cipet.gov.in), e-mail : [larpmpipet@larpmp.in](mailto:larpmpipet@larpmp.in)**



**SCHOOL FOR ADVANCED RESEARCH IN POLYMERS (SARP) - LARPM  
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**B-25, C.N.I. Complex, Patia, Bhubaneswar – 751 024 (Odisha)**

**Tel: 2740173, Fax : 0674-2740463**

**Email : [larpmcipet@larpm.in](mailto:larpmcipet@larpm.in)**



**e-TENDER NOTICE (02/2018-19)**

CIPET:SARP-LARPM, Bhubaneswar invites bids through e-Tender **UNDER SINGLE STAGE TWO BID SYSTEM IN e-TENDER PORTAL ([www.tenderwizard.com/CIPET](http://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.	Twin Screw Compounding Extruder	02/2018-19
2.	Hydraulic Compression Molding Machine	
3.	Moisture Analyzer	
4.	Dry Blender/High Speed Mixer	
5.	Dielectric Strength Measuring Equipment	
6.	Volume & Surface Resistivity Tester With All Related Accessories	
7.	UV-Vis Spectrophotometer	
8.	Glove Box Set up	

Bidders are requested to visit the web-site [www.tenderwizard.com/CIPET](http://www.tenderwizard.com/CIPET) or [www.cipet.gov.in](http://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 : 18.03.2019, 03.00 P.M.**

**Opening of Technical bid : 19.03.2019, 03.30 P.M.**

**Opening of Commercial bid : After Evaluation of Technical Bid**

**For further clarification, please contact no. 0674-2740173/9090968453/7894316788**

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.

**Administrative Officer, 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 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;
- (e) Manufacturer's Authorization Form;
- (f) Bid Form and Price Schedules;
- (g) Contract Form;
- (h) 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.
- **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.
- **Delivery Period :** Supplier should be delivered the instrument within 7-8 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 Manufacture 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 form 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 of .....having 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

**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 ..... (Full address of Purchaser)	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?
				As per Contract	Actual		
1	2	3	4	5	6	7	8



Signature and seal of the Bidder

**PROFORMA FOR DEVIATION STATEMENT**

Bid Ref No.

Date of Opening

Time :

Name of the Firm

Name of the Equipement quoted

Model No.:

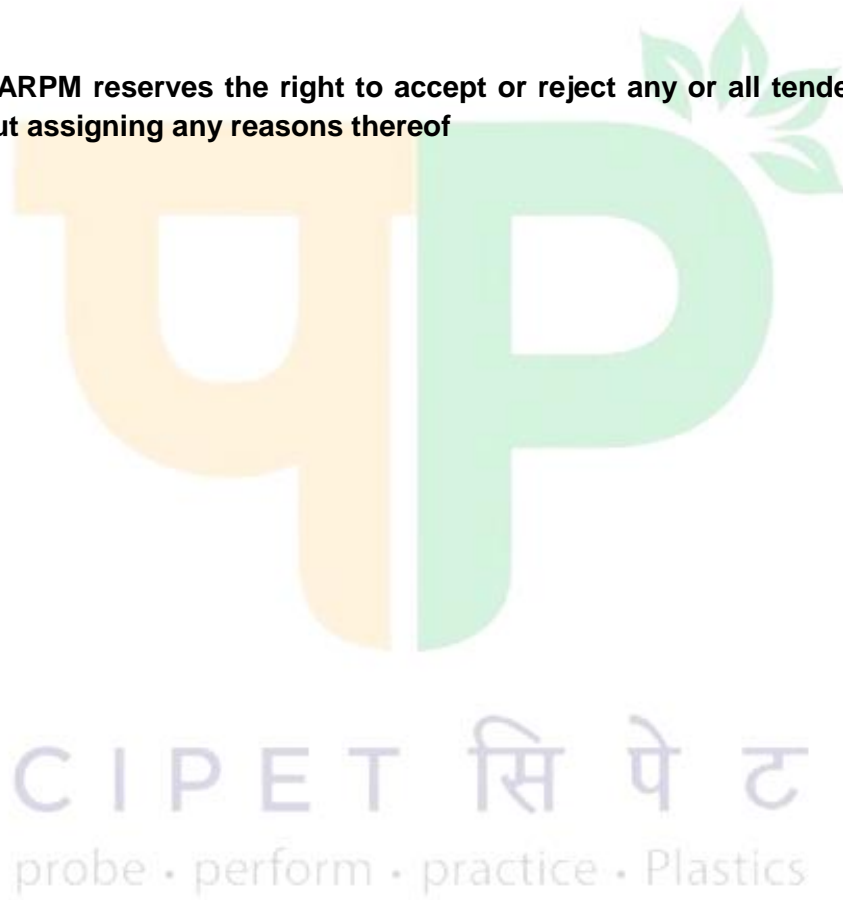
Purchaser's Specification	Bidders Specification	Deviation, if any	Justification	Remarks

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 etenderwizard:**

<b>Sl. No.</b>	<b>Name of the Official</b>	<b>Contact Number</b>	<b>e-mail ID</b>
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**



<b>Name</b>	:	<b>01. HYDRAULIC COMPRESSION MOLDING MACHINE</b>
<b>Quantity</b>	:	01unit
<b>Purpose</b>	:	Compounding and pelletizing of plastic compounds using engineering plastics such as PC, ABS, PBT, Nylon etc
<b>Reference Standard</b>	:	Not Applicable

### TECHNICAL SPECIFICATION

Screw Diameter	35mm or equivalent to meet the minimum output
Screw Length L:D	40-44L/D
Drive Power	30KW or as suitable
Maximum Screw Speed (min-1)	600 to 800 rpm
Screw Set-up	Variable
Heating zone	<ul style="list-style-type: none"> <li>Proper heating control for barrel and die with sufficient heater arrangement</li> </ul>
Minimum output	70 Kgs/Hr
Processing temp (maximum)	450 °C
Down Stream Equipment (accessories)	Strand die with minimum 06nos of hole, stainless steel cooling Trough, pelletizer & automatic Volumetric feeder
Feeding System	<ul style="list-style-type: none"> <li>Automatic Volumetric feeder for powder &amp; pellets,</li> <li>Heating/Water cooling provision</li> </ul>
Cooling type	<b>Dedicated Water Chiller of suitable capacity</b>
Software	The M/c Should be loaded with requisite software to run the equipment with automatic evaluation of Torque, temperature, pressure, storage of data etc.
Major requirements	<ol style="list-style-type: none"> <li>The machine should be supplied with melt sensor and pressure sensor of reputed make.</li> <li><b><u>Chiller of appropriate capacity with necessary heat exchanger, hoses &amp; nipples wherever required for connection.</u></b></li> <li>Complete attachable setup with air knife and strand pelletizing system with variable speed for cutting different length.</li> <li>Manual Screen pack changer (with 02 no. of additional sets)</li> <li>Required de-volatilizing system</li> </ol>



Spares	<ul style="list-style-type: none"> <li>• Heaters with sensors for barrel &amp; Nozzle-1 set</li> <li>• Screw elements of different type for compounding requirements of polymeric materials like ABS,PC,PBT &amp; Nylon.</li> <li>• Hydraulic Oil,Grease,lubricating Oiletc-As per requirements for Installation &amp; operation of Machine</li> <li>• Electrical Spares(of Reputed Make) like SS Relay each-01 set,Fuses-01 set,MCB-02 Nos.</li> </ul>
Mandatory Items	<p>While supplying the Machine, the supplier should also provide</p> <ul style="list-style-type: none"> <li>• Hard copies of Operational &amp; Service Manual- 01</li> <li>• Basic Tool Kit box with all necessary Tools like spanner,allenkeys,scew driver set,etc,</li> <li>• Cleaning Tools</li> <li>• Safety gloves &amp; goggles required for day to day activities during operation of Machine.</li> <li>• Machine should come with all other essential accessories &amp; spares required for installation,&amp; commissioning .</li> </ul>

<b>Name</b>	:	<b>02. HYDRAULIC COMPRESSION MOLDING MACHINE</b>
<b>Quantity</b>	:	01 Unit with Cavity Moulds
<b>Purpose</b>	:	Molding of polymeric material under compression press as per the desired size to undertake specimen preparation for various mechanical properties study.
<b>Principle/ Definition</b>	:	It applies hydraulic mechanism for applying a large lifting force or compressive force.
<b>Reference Standard</b>		ASTM D4703

### **TECHNICAL SPECIFICATION FOR HYDRAULIC COMPRESSION MOLDING MACHINE**

Clamping force	30 ton (adjustable) . <ul style="list-style-type: none"> <li>12 in x 12 in polished platens for heating/cooling</li> </ul> Capable of making compression molded plaques
Max. Daylight	300 mm or equivalent
No. of daylight	01
Max. mould height	300 mm or equivalent
Hydraulic cylinder stroke	140-160 mm
Ejector force/stroke	Manual
Total oil capacity	As per the requirement.
Electrical motor	2HP Motor or suitable
Mode of operation	Operating buttons, including two-hand anti-tie down-circuit
Construction type	4 post/column
Electrical heating of platens	400-425°C <ul style="list-style-type: none"> <li>Uniform temperature distribution on platen surface.</li> <li>Programmable digital controller or Strip chart recorder to record temperatures of each molding assembly.</li> </ul>
Hydraulic System	Self-contained, energy efficient hydraulic system with access panel and gauge for Oil level and temperature indication should be provided. It should have dual pump system and water cooled heat exchanger.
Control System	<ul style="list-style-type: none"> <li>Operating buttons, including two hand "anti-tie-down" circuit for cycle initiation.</li> <li>Proximately switches to control "slow close" position and "cycle reset".</li> <li>Clamp pressure relief valve and gauge.</li> </ul>
Cooling System	<ul style="list-style-type: none"> <li>Water chiller cooling system to be provided which should be controlled by microprocessor based temperature controllers which are programmed for the specified cooling rate.</li> </ul>
Safety features	<ul style="list-style-type: none"> <li>Safety guards to be provided with the molding area with manual/automatic sliding, interlocked operator gate</li> </ul>

<ul style="list-style-type: none"> <li>Automatically switching from heating to cooling mode.</li> <li>The system should have automatic low pressure system</li> <li>Thermocouples for insertion into drilled backing plates.</li> </ul>	
Calibration certificates	<ul style="list-style-type: none"> <li>Calibration of platen temperature control &amp; pressure calibration to be provided.</li> </ul>
<p>The machine should be supplied with suitable compression Moulds as per below specification, material feeding-manually, compression release, ejection, curing time one cycle auto.</p>	

**COMPRESSION MOULDS**

Mould material	:	Stainless Steel
Top plate	:	300×300×5 mm
Bottom Plate	:	300×300×5 mm
Cavity Plate	:	200×200×5 mm and 200×200×3 mm, 200×200×2 mm and 200×200×1 mm
Specimen moulds	:	Cavities with specimen dimensions complying to above standards to be provided
Mandatory Items	<p>While supplying the Machine, the supplier should also provide the following items apart from above:</p> <ul style="list-style-type: none"> <li>Hard copies of Operational &amp; Service Manual- 01 set</li> <li>Basic Tool Kit box with all necessary Tools like spanner, allen keys, scew driver set, etc ,</li> <li>High temperature safety gloves &amp; goggles required for day to day activities during operation of Machine.</li> <li>Electrical spares of reputed brand –Catridge Heaters-01 set, temperature sensor-01 set, solenoid valve-01 ,MCB - 01no</li> <li>Machine should come with all other essential accessories &amp; spares required for installation, commissioning &amp; Operation including Hydraulic Oil .</li> </ul>	

<b>NAME</b>	:	<b>03. MOISTURE ANALYZER</b>
<b>QUANTITY</b>	:	01 No.
<b>TYPES OF TESTS TO BE PERFORMED</b>	:	Determining Moisture Content in both high level and trace amounts in solids, liquids, or gases.
<b>APPLICABLE STANDARD</b>	:	ASTM D6980-12

### TECHNICAL SPECIFICATION

PARAMETERS	DETAILS
Measuring method	Halogen Lamp
Sample capacity(Weight)	Range: 70g to 100g
Pan size	Range: 75-85mm
Sample Pan	Made from "0" temper, Aluminum 3003 or other nonreactive material.
Display	LCD/VFD
Temperature range	30°C to 200 °C in 1°C increments
Units of measurements	Weight, %Moisture, Ratio.
Moisture Content Readability	0.001%
Weight resolution	+/-0.0001g
Moisture (%)	0 to 100%
Moisture Content Accuracy	0.01%
Heater	Halogen
Measurement mode	Automatic or Timed halting modes, Rapid, Slow and Step drying modes,.
Standard accessories	Sample plates(20 Nos), sample pan stop, windbreak case, sample pan, Dust Cover, handler(2 Nos), aluminum sheet, spoon, spatula, <b>Temperature calibration set</b> , Test Sample, Software.
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"> <li>• Hard copies of Operational &amp; Service Manual- 01 Set .</li> <li>• Traceable Calibration certificates.</li> <li>• Machine should come with all other essential accessories &amp; spares required for installation, commissioning &amp; Operation.</li> </ul>

<b>Name</b>	:	<b>04. DRYBLENDER/HIGH SPEED MIXER</b>
<b>Quantity</b>	:	01
<b>Types of tests to be performed</b>	:	Homogeneous high speed mixing of polymeric materials in the form of powder, liquid or pellets with different additive systems in the form of powder, liquid or pellets.
<b>Applicable Standard</b>	:	NA

### **TECHNICAL SPECIFICATION**

Paramerters	Details
Batch Capacity	: 10kgor its equivalent volume in liters
No. of container	: 01 Heating Tank+ 01 Cooling tank
Motor	: 2 HP or as per sutability&of good quality for each container.
Auto Timer	: Digital
Drum Material	: Stainless Steel of 304 material or better
Power	: 230 v, 50 Hz
Temperature accuracy	: $\pm 0.1$ °C or better
RPM range	: 20-200 adjustable
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"> <li>• Hard copies of Operational &amp; Service Manual- 01 Set .</li> <li>• Machine should come with all other essential accessories &amp; spares required for installation, commissioning&amp; Operation.</li> </ul>
<ul style="list-style-type: none"> <li>• The machine should have provision for programmable heating &amp; cooling mixing of batches with auto transfer</li> <li>• Programmable control system for monitoring temperature of heating &amp; cooling phase .</li> <li>• The system should have the facility to change the speed, electronic timer to set the required batch time etc.</li> <li>• The system should be equipped with requisite safety features needed for smooth operation.</li> <li>• AC drive for variable speed control</li> </ul>	

<b>NAME</b>	:	<b>05. DIELECTRIC STRENGTH MEASURING EQUIPMENT</b>
<b>QUANTITY</b>	:	01
<b>TYPES OF TESTS TO BE PERFORMED</b>	:	To determine the dielectric breakdown voltage through the thickness of a Polymeric test specimen .It may also be used to determine dielectric breakdown voltage along the interface between a solid specimen in air and oil medium.
<b>APPLICABLE STANDARD</b>		ASTM D 149

**TECHNICAL SPECIFICATION**

<b>PARAMETERS</b>	<b>DETAILS</b>	
Voltage Source	Suitable step-up Transformer supplied from a variable sinusoidal low-voltage source with Voltage capacities range 0 to 100 kV rms  With ratio of crest to root-mean-square (rms) test voltage ,equal to $\sqrt{2} \pm 5\%$ (1.34 to 1.48), with the test specimen in the circuit, at all voltages greater than 50 % of the breakdown voltage.	
Frequency	from 25 to 800 Hz	
Voltage rise time& accuracy	Suitable as per Method A,B, & C of ASTM D 149	
Voltage rise time Resolution	0.1 kV $\pm 1\%$	
Test Vessels/Medium	Suitable Oil media Tank in line with the requirement of Standard	
Test Temperature range	10 °C to 65 °C	
Temperature resolution	1 °C or better	
Power supply	voltage	85 to 265 VAC
	frequency	50/60 Hz
Interface	RS-232 interface , I/O port with safety interlock, USB Host Port for Data/Program storage	
Mandatory Items With the Machine	AC/DC Digital Voltage Meter: 50,100,150,200kV	
	DC micro-ammeter	
	Electrode set of Type 1 to Type 7 as per standard	
Additional Requirements	Special Features Needed	<ul style="list-style-type: none"> <li>Vendors must have sufficient experience in supplying equipment to reputed organizations of Plastic/polymer Industries</li> <li>Magnetic bead stirrers</li> <li><b>Sample cutter as per standard.</b></li> </ul>
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"> <li>Hard copies of Operational &amp; Service Manual- 01Set.</li> <li>Traceable Calibration certificate of equipment.</li> <li>External printer with USB interface and PCL3 driver</li> <li>Machine should come with all other essential accessories &amp; spares required for installation, commissioning&amp; Operation.</li> </ul>	



<b>NAME</b>	:	<b>06. VOLUME &amp; SURFACE RESISTIVITY TESTER WITH ALL RELATED ACCESSORIES</b>
<b>QUANTITY</b>	:	01 Set
<b>TYPES OF TESTS TO BE PERFORMED</b>	:	Volume Resistivity & Surface resistivity of various Polymeric materials according to various Indian and International standards.
<b>APPLICABLE STANDARD</b>	:	ASTM D 257

### TECHNICAL SPECIFICATION

PARAMETERS	DETAILS
Resistance Measurement Range	10 <sup>3</sup> to 1 x 10 <sup>14</sup> Ω Type of Measurement: Direct-reading from the instrument Ohms Shunted by Insulation Resistance from main electrode to Guarded Electrode
Resistance Measurement accuracy	±0.5% of setting value
Test Voltage Range	Programmable test voltage up to 1000V
Voltage Accuracy	±(1% of setting +2V ) with resolution 250 mV
Display type	High-visibility blue LCD Graphical Display, High-Voltage Indicator & Pass/Fail indicator.
Standard features	Fully programmable via on-screen, Safety interlock, keypad lockout, measurement averaging (1-140 readings), programmable test times, automatic zeroing of test leads
Operating temp. range	0° C to 50 °C
Operating humidity range	<45% RH
Electrode	<ol style="list-style-type: none"> <li>1) Standard electrodes with guard ring .The electrodes for insulating materials should be of a material that is readily applied, allows intimate contact with the specimen surface, and introduces no appreciable error because of electrode resistance or contamination of the specimen. The electrode material should be corrosion-resistant under the conditions of test. For tests of fabricated specimens such as feed-through bushings, cables, etc.</li> <li>2) Broad combination of electrodes support for measuring a wide variety of objects having different size and shape(Circular, Rectangular, Square, Tube, Cable etc.)</li> </ol>
Calibration Kit	Required calibration kit should be provide along with instrument.

Interface	RS-232 interface , I/O port with safety interlock, USB Host Port for Data/Program storage	
Additional Requirements	Special Features Needed	<ul style="list-style-type: none"> <li>• Vendors must have sufficient experience in supplying equipment to reputed organizations of Plastic/polymer Industries</li> <li>• Sheets and molded products should be measured just as they are without the need to cut samples.</li> </ul>
Testing	Should be Suitable For Electrical testing of Plastics, Rubbers, Films, FRP Composites.	
Power Supply (Mains)	220 V AC in single	
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"> <li>• Hard copies of Operational &amp; Service Manual- 01 Set .</li> <li>• Traceable Calibration certificate of equipment .</li> <li>• Machine should come with all other essential accessories &amp; spares required for installation, commissioning&amp; Operation.</li> </ul>

<b>Name</b>	<b>07. UV-VIS SPECTROPHOTOMETER</b>
<b>Quantity</b>	01
<b>Types of tests to be performed</b>	For Effect on Water test for other Toxic Substances
<b>Applicable Standard</b>	IS:12235,IS-4985,IS-12818,IS-7834,IS14182 & IS-15778

### TECHNICAL SPECIFICATION

<b>Photometric system</b>	Double beam optics
<b>Monochromator</b>	Czerny-Turner mounting of Monochromator (1200 lines/mm or better) with best dispersion.
<b>Stray Light</b>	< 0.00005% at 200 nm, < 0.005 % T at highest wavelength or better
<b>Light Source</b>	Instrument should have 2 sources i.e. (1) Halogen lamp (7000 hr Life or more) for Visible range (2) Deuterium Lamp (7000 hr Life or more) for UV range, light source should be automatically selected as per wavelength required.
<b>Detector</b>	Instrument should have high sensitive Photomultiplier tube as a detector or a Si detector for the UV-vis range and InGaAs and PbS for the range above 1000 nm.
<b>Wavelength Range</b>	200 to 1800 nm or higher
<b>Spectral Bandwidth</b>	± 0.1 to 10 nm (visible range)
<b>Wavelength Accuracy</b>	± 0.3 nm or better for visible range.
<b>Resolution</b>	0.1 nm or better.
<b>Wavelength Repeatability</b>	± 0.05 nm or better
<b>Wavelength scanning speed</b>	Instrument should have variable wavelength scan rate from 4000 to 2 nm/Min, with automatic selection.
<b>Photometric range</b>	Absorbance = -5 to 5 Abs or better. Transmittance & reflectance 0 to 80000% or better.
<b>Photometric Accuracy</b>	Instrument should have photometric accuracy of ± 0.004 Abs (at 1 Abs) or better & ± 0.007 Abs (at 2 Abs) or better.
<b>Photometric repeatability</b>	± 0.001 Abs (at 1 Abs) or better & ± 0.003 Abs (at 2 Abs) or better.
<b>Baseline Flatness</b>	± 0.0005 Abs or better
<b>Noise Level</b>	0.00003 Abs RMS (500nm) or better
<b>Accessories</b>	<ol style="list-style-type: none"> <li>1. Latest Branded PC i7 windows 10 compatibilities, Display Screen,</li> <li>2. 10 mm rectangular quartz cell – 4 numbers with volume of 3 ml or slightly more.</li> <li>3. 10 mm rectangular quartz cell – 4 numbers with volume of 1 ml.</li> <li>4. 1 mm rectangular quartz cell – 02 numbers</li> </ol>

### Optional Accessories

1. Absolute Specular Reflectance Attachment (at least 45°)
2. Integrating sphere accessory with facility to measure powder, film as well as liquid samples for diffuse as well as specular reflectance measurement, with wavelength range of 250 to 2000 nm.
3. 10 mm rectangular quartz cell - 01 pair
4. 100 mm cylindrical quartz cell - 02 pair
5. Film Holder - 01 no.
6. Computer Interface
7. Printer Interface
8. Traceable Calibration certificate of equipment & accessories



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<b>NAME</b>	:	<b>08. GLOVE BOX SET UP</b>
<b>Quantity</b>	:	01set
<b>Purpose</b>	:	<ul style="list-style-type: none"> <li>✓ Storage of air sensitive chemicals and fabricated devices.</li> <li>✓ Fabrication of high end electronics, energy storage and energy conversion devices</li> </ul>
<b>Principle/ Definition</b>	:	Based on the principle of continuous nitrogen flow generating an ambient atmosphere
<b>Reference Standard</b>	:	Not Applicable

### TECHNICAL SPECIFICATION

Glovebox	:	<i>Nitrogen Glovebox</i>
Moisture level Requirements	:	< 0.1 - 1ppm
Oxygen Level Requirement	:	< 0.1 -1 ppm
Material of construction	:	Stainless Steel of high quality (grade to be mentioned by bidder)
Box Windows	:	Transparent Polycarbonate which can retain pressure range of -15 mbar to +15 mbar
Pressure	:	<ul style="list-style-type: none"> <li>✓ Automatic Pressure control from -15 mbar to + 15mbar</li> <li>✓ Continuous Digital Pressure monitoring of the glove box</li> </ul>
Display of Reading	:	Direct reading of moisture and oxygen level in ppm levels to be displayed at all time along with Glove box pressure , purging condition, regeneration etc . which should be monitored/controlled through a microprocessor based control system.
Box	:	<ul style="list-style-type: none"> <li>• Scratch proof coating to protect the inner and outer housing</li> <li>• Dust filter of 0.3 micron</li> <li>• Gas inlet and outlet filter.</li> <li>• 3 height adjustable shelves</li> <li>• 3 Electrical feed throughs</li> <li>• Stand for the box along with leveling</li> <li>• Foot pedal control of the internal pressure</li> <li>• Waterproof</li> </ul>
Antechamber Large	:	<ul style="list-style-type: none"> <li>• One antechambers made up of stainless steel with metal doors which can be interlocked to maintain</li> </ul>

		<p>pressure range of -10 mbar to 10 mbar.</p> <ul style="list-style-type: none"> <li>• Pressure gauges to monitor the pressure.</li> <li>• Metal Sliding tray to transport sample</li> <li>• Manual Control of Vacuum and Refill process</li> <li>• Door lock easy to operate with a spindle lock system</li> <li>• One large antechamber for transporting larger volume inside the glovebox. Atleast 390 mm diameter, 600 mm length</li> </ul>
Antechamber Small	:	<ul style="list-style-type: none"> <li>• Small Antechamber to allow transfer of Min. 100 mm Petridis diameter.</li> <li>• 3 way valve control with analog pressure gauge.</li> </ul>
Gas purification	:	<ul style="list-style-type: none"> <li>• Closed loop gas purification with attainable moisture and oxygen level of &lt; 0.1 ppm over complete pressure range for the complete volume of gas.</li> <li>• Accessories and columns required for the gas purification should be provided by bidder.</li> </ul>
Circulation Unit	:	<ul style="list-style-type: none"> <li>✓ Suitable blower with adequate capacity should be provided with the unit for adequate circulation along with other accessories.</li> </ul>
Regeneration	:	Automatic regeneration control and electronic control of inlet and outlet of regeneration gas.
Vacuum Requirement	:	Rotary Oil Pump of industrial required which will be capable of running 24 hours. The pump should have an oil mist filter and control for gas ballast.
Running Time	:	The instrument and the ancillary vacuum pumps should be capable for running 24 hours
Box Dimensions and number of ports	:	<ul style="list-style-type: none"> <li>✓ Suitable dimension to allow minimum 02 gloves in front to be used for accessing the box .However Box dimension with provision for 03 gloves port would be preferred.</li> <li>✓ Typical dimension of each glove port would be 200mm-220 mm diameter</li> </ul>
Chemical Storage Requirements	:	<p>The glove box and its parts should be compatible for storage and usage of</p> <ul style="list-style-type: none"> <li>• Organic solvents both chlorinated and unchlorinated.</li> <li>• Use of electrolytes and ionic liquids</li> <li>• Intermittent usage of acids and bases</li> </ul>
Box Light	:	1 tube light front mounted with adequate illumination.
Valves and Piping	:	<ul style="list-style-type: none"> <li>• Pneumatic Valve to control pressure in case of gas shut down for at least 12 hours.</li> <li>• Stainless Steel Piping</li> </ul>
Oxygen Analyzer	:	Microprocessor controlled analyzer to monitor from 1 – 1000 ppm



Moisture Analyzer	:	Microprocessor controlled analyzer to monitor from 1 – 500 ppm
Filters	:	Charcoal Filter or better system for moisture removal to achieve the required level of moisture as specified.
Catalyst for Oxygen	:	Suitable technology for oxygen removal to achieve the required level as specified
Energy Conservation	:	Any energy conservation technology would be preferred



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