

**e-Tender Document for**

**Supply and Installation of High Temperature Gel  
Permeation Chromatograph (HT-GPC)**

**at**

**CIPET:SARP- LARPM, Bhubaneswar**



**TENDER DOCUMENT NO. 03/2020-21**

**LAST DATE FOR SUBMISSION OF BID: 31.05.2020**

**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](http://cipet.gov.in), e-mail : [larpmcipet@larpm.in](mailto: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)  
B-25, C.N.I. Complex, Patia, Bhubaneswar – 751 024 (Odisha)  
Tel: 2740173, Fax : 0674-2740463  
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**e-TENDER NOTICE (03/2020-21)**

CIPET:SARP-LARPM, Bhubaneswar invites bids through e-Tender **UNDER SINGLE STAGE TWO BIDS 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.
01.	High Temperature Gel Permeation Chromatograph (HT-GPC)	03/2020-21

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 issue of tender in the portal : 31.05.2020 Time ----- 03:00 PM**

**Last date of submission of Tender in the portal : 31.05.2020 Time ----- 03:10 PM**

**Date of Opening of Technical Bid : 31.05.2020 Time ----- 03.30 PM**

**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 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) 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 2 years warranty from the date of installation and commissioning.
- **Delivery Period**:Supplier should be delivered the instrument within 08-10weeks 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 24 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 Contracttenure.

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.

CIPET सि पेट  
probe • perform • practice • Plastics  
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 DEVIATION STATEMENT**

Bid Ref No.

Date of Opening

Time :

Name of the Firm

Name of the Equipement quoted

Model No.:

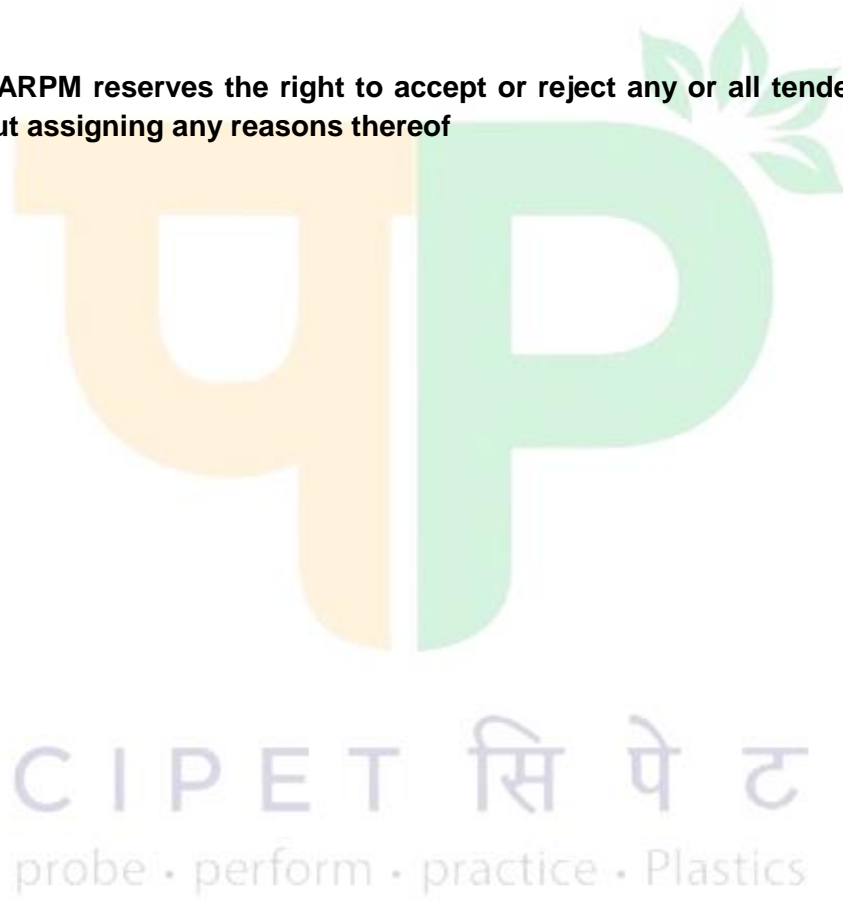
Purchaser's Specification	Bidders Specification	Deviation, if any	Justification	Remarks

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**



## HIGH TEMPERATURE GEL PERMEATION CHROMATOGRAPH (HT-GPC)

<b>NAME</b>	:	High Temperature Gel Permeation Chromatograph (HT-GPC)
<b>QUANTITY</b>	:	01
<b>TYPES OF TESTS TO BE PERFORMED</b>	:	<ol style="list-style-type: none"> <li>1. Determination of number average and weight average molecular weight, molecular weight distribution.</li> <li>2. A Fully Automated High Temperature GPC System dedicated to molar mass distribution analyses for Polyolefin's and other polymers characterization and distribution of comonomer content</li> </ol>
<b>APPLICABLE STANDARD</b>	:	ASTM D6474 – 12, ASTM D 5296, ASTM D 6579 - 11(2015)

### TECHNICAL SPECIFICATION FOR HT-GPC

Pump	Double plunger reciprocating type, isocratic mode, should be upgradeable to gradient mode later as per requirement
Flow rate range	0.1 to 10 mL/min
Flow accuracy	±1.0% of setting, better flow control
Flow precision	< 0.1% Relative Standard Deviation or better
GPC Columns	Trichloro Benzene (TCB), Tetrahydrofuran (THF), Dimethyl formamide (DMF) or suitable for polyolefins and other major polymers
Molecular weight range	Four columns of 500 to 100,00,000 Da or equivalent range with two suitable guard columns.
Calibration Standards	To be clearly specified by the bidder with requisite standards, solvent bottles, Tubings, fittings (nuts, ferrules), Inline filters with frits and other essential accessories required for calibration Polystyrene standards kits to be quoted covering full range, 4 quantity, with pre weighted standards.
Sampler	Suitable Auto-sampler Injector system
Injection volume	injection upto 5 - 500 uL
Parameters to be calculated	Molecular Weight distribution (MWD), Number average (Mn), Weight average molecular weights (Mw) and polydispersity (PD), Intrinsic viscosity, Polymer branching - <i>all GPC parameters to comply</i>
<b>Column and Column Heater</b>	
Column Capacity	Minimum 03 Columns with Guard Column to be housed
Temperature Range	Ambient to 200°C or better
Temperature Stability	±0.05 °C or better
<b>Detector</b>	
Differential Refractometer	
Flow cell Volume	10 µL or better
Drift	≤10 mV/h
Wavelength	700 to 900nm
Other desired features	Programmable functions of range, auto Zero and auto Purging
Viscometer Detector	
linearity	• 0.5%FS

Shear rate	<ul style="list-style-type: none"> <li>• 3000S-1</li> </ul>
Sensitivity $\eta_{sp}$	<ul style="list-style-type: none"> <li>• <math>1 \times 10^{-5} \text{Pa.s}</math></li> </ul>
Dual angle Light scattering detector	
Sample cell volume	<ul style="list-style-type: none"> <li>• 15 <math>\mu\text{L}</math> or better, as low as better</li> </ul>
Light Scattering volume	<ul style="list-style-type: none"> <li>• 0.1 <math>\mu\text{L}</math> or better, as low as better</li> </ul>
Sample Preparation Assembly	<ul style="list-style-type: none"> <li>• Automatic sample preparation &amp; filtration to be provided along with the equipment</li> <li>• 500 Vials for sample prep and 500 Vials for autosampler must be quoted</li> <li>• Crimper and de crimper should be quoted for vial sealing.</li> </ul>
Other desired features	<ul style="list-style-type: none"> <li>• Provision for single and multi-detection of samples should be provided</li> <li>• Lamp Optimization option to keep Lamp intensity always at 100%</li> <li>• Filter magazines in the desired range</li> <li>• Noise level, flow cell volume and optimized bandwidth to be specified</li> </ul>
Software for Chromatography Data Station with GPC Calculation	<ul style="list-style-type: none"> <li>• Control, acquire and process data</li> <li>• Software should control all the necessary detectors</li> <li>• Customized sample analysis report to be generated</li> <li>• Interactive control and display of solvent delivery</li> <li>• All functions and features to be accessible from a single window (command bar to navigate)</li> <li>• Wizards to simplify and automate common system functions</li> <li>• Instrument processing methods and reporting parameters in one place</li> <li>• Diagnostic functions and configuration wizards</li> <li>• Extensive user help.</li> <li>• Updated software to be provided to evaluate the parameter as mentioned above.</li> </ul>
Safety aspect	<ul style="list-style-type: none"> <li>• The instrument must be very safe to operate.</li> <li>• Any error / diagnostics displays, when failure of any of the parts / unit occurs, must be in-built in the system software.</li> <li>• The system must possess self-diagnostics check for performance of the instrument</li> <li>• Suitable sensors must be present for sensing solvent vapours in case of leakage at higher temperature.</li> </ul>
PC and Printer	<p>While supplying the Machines, the supplier should also provide the following items apart from above:</p> <ul style="list-style-type: none"> <li>• PC and Printer with updated configuration to be provided</li> <li>• Hard copies of Operational &amp; Service Manual- 01 set .</li> <li>• Calibration Certificate with traceability for required parameters.</li> <li>• Machine should come with all other essential accessories &amp; spares required for installation, commissioning &amp; Operation.</li> <li>• Onsite training to be provided at commissioning site.</li> <li>• Pre-installation requirements including electrical requirements to be clearly indicated.</li> </ul>



### TECHNICAL COMPLIANCE SHEET

PARAMETERS	DETAILS	COMPLIANCE (Y/N)
Applicable standard	ASTM D6474 – 12, ASTM D 5296, ASTM D 6579 - 11(2015)	
Pump	Double plunger reciprocating type, isocratic mode, should be upgradeable to gradient mode later as per requirement	
Flow rate range	0.1 to 10 mL/min	
Flow accuracy	±1.0% of setting, better flow control	
Flow precision	< 0.1% Relative Standard Deviation or better	
GPC Columns	Trichloro Benzene (TCB), Tetrahydrofuran (THF), Dimethyl formamide (DMF) or suitable for polyolefins and other major polymers	
Molecular weight range	Four columns of 500 to 100,00,000 Da or equivalent range with two suitable guard columns.	
Calibration Standards	To be clearly specified by the bidder with requisite standards, solvent bottles, Tubings, fittings (nuts, ferrules), Inline filters with frits and other essential accessories required for calibration Polystyrene standards kits to be quoted covering full range, 4 quantity, with pre weighted standards.	
Sampler	Suitable Auto-sampler Injector system	
Injection volume	injection upto 5 - 500 $\mu$ L	
Parameters to be calculated	Molecular Weight distribution (MWD), Number average (Mn), Weight average molecular weights (Mw) and polydispersity (PD), Intrinsic viscosity, Polymer branching - <i>all GPC parameters to comply</i>	
<b>Column and Column Heater</b>		
Column Capacity	Minimum 03 Columns with Guard Column to be housed	
Temperature Range	Ambient to 200°C or better	
Temperature Stability	±0.05 °C or better	
<b>Detector</b>		
Differential Refractometer		
Flow cell Volume	10 $\mu$ L or better	
Drift	≤10 mV/h	
Wavelength	700 to 900nm	
Other desired features	Programmable functions of range, auto Zero and auto Purging	
Viscometer Detector		
linearity	• 0.5%FS	
Shear rate	• 3000S-1	
Sensitivity $\eta_{sp}$	• $1 \times 10^{-5}$ Pa.s	
Dual angle Light scattering detector		
Sample cell volume	• 15 $\mu$ L or better, as low as better	

Light Scattering volume	<ul style="list-style-type: none"> <li>• 0.1 µL or better, as low as better</li> </ul>	
Sample Preparation Assembly	<ul style="list-style-type: none"> <li>• Automatic sample preparation &amp; filtration to be provided along with the equipment</li> <li>• 500 Vials for sample prep and 500 Vials for autosampler must be quoted</li> <li>• Crimper and de crimper should be quoted for vial sealing.</li> </ul>	
Other desired features	<ul style="list-style-type: none"> <li>• Provision for single and multi-detection of samples should be provided</li> <li>• Lamp Optimization option to keep Lamp intensity always at 100%</li> <li>• Filter magazines in the desired range</li> <li>• Noise level, flow cell volume and optimized bandwidth to be specified.</li> </ul>	
Software for Chromatography Data Station with GPC Calculation	<ul style="list-style-type: none"> <li>• Control, acquire and process data</li> <li>• Software should control all the necessary detectors</li> <li>• Customized sample analysis report to be generated</li> <li>• Interactive control and display of solvent delivery</li> <li>• All functions and features to be accessible from a single window (command bar to navigate)</li> <li>• Wizards to simplify and automate common system functions</li> <li>• Instrument processing methods and reporting parameters in one place</li> <li>• Diagnostic functions and configuration wizards</li> <li>• Extensive user help.</li> <li>• Updated software to be provided to evaluate the parameter as mentioned above.</li> </ul>	
Safety aspect	<ul style="list-style-type: none"> <li>• The instrument must be very safe to operate.</li> <li>• Any error / diagnostics displays, when failure of any of the parts / unit occurs, must be in-built in the system software.</li> <li>• The system must possess self-diagnostics check for performance of the instrument</li> <li>• Suitable sensors must be present for sensing solvent vapours in case of leakage at higher temperature.</li> </ul>	
PC and Printer	<p>While supplying the Machines, the supplier should also provide the following items apart from above:</p> <ul style="list-style-type: none"> <li>• PC and Printer with updated configuration to be provided</li> <li>• Hard copies of Operational &amp; Service Manual- 01 set.</li> <li>• Calibration Certificate with traceability for required parameters.</li> <li>• Machine should come with all other essential accessories &amp; spares required for installation, commissioning &amp; Operation.</li> <li>• Onsite training to be provided at commissioning site.</li> <li>• Pre-installation requirements including electrical requirements to be clearly indicated.</li> </ul>	