



सीएसआईआर- भारतीय रासायनिक प्रौद्योगिकी संस्थान  
**CSIR-Indian Institute of Chemical Technology**  
आई. एस. ओ. 9001 संगठन (विश्लेषणात्मक परिसेवा हेतु) / ISO 9001 Organization (for Analytical Services)  
(वैज्ञानिक तथा औद्योगिक अनुसंधान परिषद) / (Council of Scientific and Industrial Research)  
तारनाका, उप्पल रोड, हैदराबाद. तेलंगाना राज्य, भारत. 500 007.  
Tarnaka, Uppal Road, Hyderabad. Telangana State, India. 500 007



## PURCHASE ORDER

No: PUR/IICT/0503/24-25/EQPT/2924

Date: 23-01-2025

To  
M/s. VERDER Scientific Private Limited  
Plot No.-5A/10-11,IDA Nacharam  
Road No.1,Uppal Road  
Hyderabad-500076  
Ph:040-2980 6688  
Email:info.scientific.in@verder.com

Sub;- Supply Installation and Commissioning of “Chemisorption Analyzer With Q-Mass Detector For Multi Gas Analysis”- reg.

Ref: - 1. Our Tender Enquiry No. PUR/IICT/0503/RE/24-25/EQPT DT.28.09.2024 and CPPP tender enquiry No.2024\_CSIR\_209744\_1Dt.28.09.2024.  
2. Your bid reference No:VERDER/MRB/BELCAT/IICT/1025 DT.25.10.24 and revised offer no.VERDER/MRB/BELCAT/IICT/1226 DT.26.12.2024.

Dear Sirs,

Kindly supply the following item(s) strictly as per the terms and conditions.

Sl. No	DESCRIPTION OF MATERIAL	Quantity	Price in (₹)	Total Amount in (₹)
1.	Chemisorption Analyzer With Q-Mass Detector For Multi Gas Analysis <i>(Detailed Specifications and other items and accessories as per Annexure enclosed)</i>	1No.	79,65,000.00	79,65,000.00
				79,65,000.00
Add GST @18%				14,33,700.00
FOR CSIR-IICT, Hyderabad				93,98,700.00

### TERMS & CONDITIONS:

1. **Prices:** FOR CSIR-IICT Inclusive of all taxes, duties etc., Hyderabad. Unloading the consignment at our site is your cost.

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2. **Order Acknowledgement:** Kindly send order acknowledgement within 15 days through Email: [cosp@iict.res.in](mailto:cosp@iict.res.in) and [csiriict@csiriict.in](mailto:csiriict@csiriict.in) mention PO No. in the subject line. If you notice any discrepancy/typographical error etc. in this order, you must immediately request for its amendment/correction. Further along with duly signed and stamped copy of this P.O. as token of acceptance of terms and conditions of this P.O. You are also required to sign a contract agreement in pursuance of this Purchase Order in the prescribed format on a Non-Judicial Stamp paper of Rs 200/-**(contract form attached)**
3. **Taxes and Levies: Price includes GST@18% also**
4. **Delivery Period :** The ordered material should be supplied within the delivery period of 90 Days from the date of receipt of the Purchase Order.
5. **PAYMENT TERMS:** I) 80% through RTGS /NEFT or online mode against supply in complete quantity of ordered items in good condition as per ordered specifications and terms, subject to its joint inspection in the presence of suppliers service engineers/ representative and its confirmations and acceptance by CSIR IICT user Scientist.  
II) Balance 20% through RTGS /NEFT or online mode after successful completion of installation and commission and final acceptance of End User, our Bankers State Bank of India, IICT Branch, Hyderabad, successful Installation, subject to submission of prescribed PBG.
6. **Warranty:** Warranty should be furnished for **36 months** from the date of successful installation and commissioning of the equipment and subject to final acceptance of the same by the CSIR-IICT user. If CSIR IICT wants to enter into CAMC/AMC in future after warranty period the amount for AMC charges shall not exceed CAMC/AMC Charges indicated in quotation (if any) and the same will not be paid in advance and the same shall be paid on bill basis only.
7. **Performance Bank Guarantee: 5% PBG valid till 60 days** beyond the prescribed warranty period starting from the date of final installation and commissioning to be submitted within 21 days from the date of the Purchase Order, failing which order may be cancelled at the discretion of CSIR IICT.
8. **INSTALLATION, COMMISSIONING AND DEMONSTRATION:** A qualified and factory-trained service engineer should commission the supplied equipment free of cost within *one* month from the date of receipt of the ordered goods and onsite application training to be provided for 2 persons 3 working days at CSIR IICT., Telangana, India. Supplier has to inform pre-installation requirements if any for site readiness within 10 days of receipt of this mail.
9. **LD clause:** Timely supply is the essence of stipulation in the delivery period of

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our purchase order, for our requirements have got a direct bearing with time targeted research work. By any measure, if there is any delay in delivery of the ordered material(s), a sum equivalent to **0.5 (point five)** per cent of contract value for each week of delay or part thereof until actual delivery will be deducted from the contract value as liquidated damages, subject to the maximum deduction of **10 (ten) per cent** of P.O. Value. CSIR IICT is also at liberty to consider the termination of the contract of the items is not delivered within the delivery period without assigning any reason thereof.

10. **CSIR-IICT-GST No: 36AAATC2716R2ZF**  
**PAN No. AAATC2716R TAN No. HYDI00674C**
11. **Availability of spares and service engineer support shall be conformed for a period of 10 years as part of after sales and service support on applicable charges after warranty period.**
12. The dispute settlement mechanism/arbitration proceedings shall be Concluded as under:
  - a) If any dispute or difference arises between the parties hereto as to the construction, interpretation, effect and implication of any provision of this agreement including the rights or liabilities or any claim or demand of any party against other or in regard to any other matter under these presents but excluding any matters, decisions or determination of which is expressly provided for in this Agreement, such disputes or differences shall be referred to **Delhi International Arbitration Centre (DIAC), New Delhi**. A reference to the Arbitration under this Clause shall be deemed to be submission within the meaning of the Arbitration and Conciliation Act, 1996 and the rules framed thereunder for the time being in force. Each party shall bear and pay its own cost of the arbitration proceedings unless the Arbitrators otherwise decides in the Award.
  - b) In the case of a dispute between the purchaser and a Foreign Supplier, the dispute shall be settled by arbitration in accordance with provision of sub-clause (a) above. But if this is not acceptable to the supplier then the dispute shall be settled in accordance with provisions of UNCITRAL (United Nations Commission on International Trade Law) Arbitration Rules.

The venue of the arbitration shall be the place from where the purchase order or contract is issued. (for further information please

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refer to our Tender Document)

13. **Jurisdiction** - All disputes related to this tender shall be subject to the local court of competent jurisdiction at **HYDERABAD, Telangana, India** only.

14. The terms and conditions and tender specifications and clarification there off as contained in the tender document shall form part of this purchase order .However, Incase of any discrepancy between this P.O. and Tender terms this purchase order (P.O.) shall prevail.  
Bill of entry to be submitted at the time of delivery of goods in case of foreign Origin.

Yours faithfully,  
For & on behalf of CSIR,

*[Handwritten Signature]*  
23-01-20

(Dharmendra Kumar)  
Controller of Stores & Purchase

Note: Kindly, mention our purchase order reference number for all your future correspondence so as to enable us to avoid any delay while tracking/clearing the material(s).

**Budget Head: P-50 for Rs.93,98,700/-** (Rupees Ninety Three Lakhs Ninety Eight Thousand Seven Hundred only)

1. Indentor's copy: Dr.G.H.Gunasekar (CFC Divn) 2. Accounts copy; 3. Office copy; 4. Guard File copy 5. Spare copy;



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NO.PUR/IICT/0503/RE//24-25/EQPT/

DT.21.01.2025

## Technical Specifications

SI.No.	Description	QTY						
	<p><b>BELCAT II: A fully-automated catalyst analyzer</b> for research and quality control which enables comprehensive catalyst evaluation by using the following techniques:</p> <ol style="list-style-type: none"><li>1. Pulse chemisorption</li><li>2. Temperature programmed desorption (TPD) / Temperature programmed reduction (TPR) / Temperature programmed oxidation (TPO) /</li><li>3. Temperature programmed reaction (TPReaction)</li><li>4. BET single point measurement</li><li>5. Adsorption breakthrough curve measurement</li></ol> <p><b>Some of the typical applications of BELCAT II include</b></p> <ol style="list-style-type: none"><li>1. Acidity study of cracking catalyst by ammonia or pyridine TPD</li><li>2. Basicity study of solid base catalyst</li><li>3. Metal dispersion rate of exhaust gas catalyst / fuel cell electrode catalyst</li><li>4. Determination of optimal preparation conditions of catalyst</li><li>5. Catalytic reaction study</li></ol> <p><b>Gas mixing function is included as a standard supply</b></p> <p><b>The scope of supply of the offered analyser includes the following</b></p>							
<b>1.0</b>	<p><b>BELCAT II Main Unit with following modules with Salient Specifications and Features as below:</b></p>	<b>1No.</b>						
	<table border="1"><tr><td># Measurement principle</td><td>Dynamic flow method</td></tr><tr><td># Detector</td><td>Semi-diffusion type 4-element TCD with tungsten rhenium filament.</td></tr><tr><td># Sample Ports</td><td>: 1 number for measurement &amp; pre-treatment</td></tr></table>	# Measurement principle	Dynamic flow method	# Detector	Semi-diffusion type 4-element TCD with tungsten rhenium filament.	# Sample Ports	: 1 number for measurement & pre-treatment	
# Measurement principle	Dynamic flow method							
# Detector	Semi-diffusion type 4-element TCD with tungsten rhenium filament.							
# Sample Ports	: 1 number for measurement & pre-treatment							

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	# Injection gas	He, Ar, N <sub>2</sub> , O <sub>2</sub> , H <sub>2</sub> , CO, CO <sub>2</sub> , NH <sub>3</sub> , N <sub>2</sub> O, NO, etc...	
	# Pulse loop	: With temperature and pressure sensor for very high reproducibility	
	Gas Ports	: Total 8 ports, : Includes 2 ports for corrosive gases	
	# Carrier Gas	Up to 3 gases selectable	
	# Gases for Pretreatment /Pulse / Gas mixing	: Up to 8 gases selectable	
	# Mass flow Controller	:Three high performance mass flow controllers. : Carrier: F.S. 100 sccm : Pre-treatment / pulse: F.S.100 sccm : MIX: F.S.30 sccm	
	# Electric furnace	:Regular temperature: 1,100°C, :Maximum temperature: 1,200°C :Quick cooling: 30min (400→50°C) : Heating rate : 110°C/min(50-500°C) : Heating rate : 80°C/min(50-1000°C)	
	# Standard gas mixing line.	: To prepare binary gas mixtures , such as 5%H <sub>2</sub> /Ar, 5%O <sub>2</sub> /He, 10%CO/He, 5%NH <sub>3</sub> /He, etc. Eliminates the need for pre-mixed gas cylinders, prepares on-line gas mixtures by using pure gas cylinders.	
	# Trap Port	: For cold trap / column holder for optional accessories	
<b>1a</b>	Quartz Tubes. Outer,	25 numbers	

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1b	O-ring (P-4, FFKM), O-ring (P-10A, FFKM), O-ring (P-20, FFKM),	25 numbers each	
2	<b>Measurement and Analysis Software (ChemMaster II)</b> : A user friendly and intuitive software for measurement and analysis to perform: spectrum image display, spectrum processing and area calculation, baseline correction and spike noise filter function among others. Distribution Fitting function for peak deconvolution function which allows to split the measured spectrum into multiple peaks thereby determining the number of active sites present on the catalyst surface. Analyses of pulse measurement spectrum and many more.		1
3	<b>Vapor dosing system</b> : Includes Air bath (variable up to 150°C), bubbling bottle, heater, condenser, etc.,. Temperature range: 3 to 100°C. The vapor pressure is accurately controlled combination of bubbler heater and Peltier controlled condenser.		1
4	<b>Separation Column / Trap column: For N2O Pulse Chemisorption to estimate metal dispersion rate of metals such as Cu, Ni, Co, etc</b>		1
5	<b>BELMASS II: Q-mass unit for multi component gas analysis (a.m.u. 1-200). Equipped with capillary tube (SUS) and in-built diaphragm pump.</b> A Benchtop quadrupole type mass spectrometer, which can be used with BELCAT II for catalytic reaction investigation and also breakthrough curve measurement, it enables BEL-REA, BELMass advanced analyses. The mass detector is known as the most efficient detector for qualitative analysis. However, at the same time it is difficult to obtain good quantitative results. Microtrac MRB has customised the BELMass spectrometer with high quantitative capacity by selecting the most appropriate materials and component layout. Even ammonia gas can be analysed easily by using the heat hose and dry diaphragm pump.		1
6	Standard Set of Accessories and Consumables		1
7	Quartz Tubes. Outer, (25 numbers)		1



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8	O-ring (P-4, FFKM), (25 numbers) O-ring (P-10A, FFKM), (25 numbers) O-ring (P-20, FFKM), (25 numbers)	1
9	<b>Filter (2<math>\mu</math>), 20 numbers</b>	1
10	<b>Standard Reference Material (CRM)</b> for pulse chemisorption, TPR & TPD 1). Reference sample (MFI, 1g) For NH <sub>3</sub> TPD measurement. 2). Reference sample (2wt%Pt/Al <sub>2</sub> O <sub>3</sub> , 1g) For CO pulse chemisorption. 3). Reference Sample for TPR	1
11	<b>Computer PC:</b> 1). Processor i7, 10th generation, 16 GB RAM, 1 TB SSD. 2). Key board and Mouse 3). Monitor 24 inches 4). WIN 10 Pre installed 5). MS office Pre installed	1
12	Multi function laser printer (duplex printing). B&W 1	
13	Total Warranty for THREE years	1
14	Installation Commissioning and On Site Training	1

The Supplied Equipment along with accessories should completely comply with all the technical specifications and related requirements indicated in Chapter 4 of Tender Documents on the subject and subsequent "corrigendum" issued in pursuance of the same.

*aw*  
*23.01.25*

**Controller of Stores & Purchase**