



भारतीय विज्ञान शिक्षा एवं अनुसंधान संस्थान तिरुपति

INDIAN INSTITUTE OF SCIENCE EDUCATION AND RESEARCH TIRUPATI

(An Autonomous Institute under Ministry of Education, Govt. of India)
Transit Campus: Sree Rama Engineering College Campus, Karakambadi Road,
Mangalam B.O., Tirupati – 517 507, Andhra Pradesh, India.

Website: <http://www.iisertirupati.ac.in/>

CLARIFICATION ON TENDER NUMBER: IISERT/PUR/0485/21

ITEM DESCRIPTION- SUPPLY, INSTALLATION AND COMMISSIONING OF FIXED BED REACTOR.

REFER TO OUR TENDER NO: IISERT/PUR/0485/21, DATED: 23/12/2021 FOR SUPPLY, INSTALLATION AND COMMISSIONING OF FIXED BED REACTOR.

The pre-Bid meeting was held on December 31st, 2021 at 15:30 Via Google Meet and the minutes of the meeting is as under.

At the outset, the Chairman welcomed all the Members and the representative of the Prospective Bidders briefed, in general, the scope of the Project and thereafter requested Deputy Registrar (S&P) to brief the vendors on the salient features of the commercial terms and the indenting Officer to read out the clarification sought by the Prospective Bidders and replied thereto as detailed in **Annexure-II**

The representatives present were satisfied with the replies given and it was informed that the corrections/additions/clarifications given, as discussed during the Pre-Bid Conference would be hosted on the website of IISER Tirupati and all the Prospective Bidders are required to take cognizance of the proceedings of the Pre-Bid Conference before submitting their bids as stipulated in the Bidding Documents.

The other terms & conditions of the notice issued on our IISER website <http://www.iisertirupati.ac.in/> will remain unchanged. No more correspondence in this regard will be entertained

The meeting ended with a vote of thanks.

06.01.2022

Sd/-
Deputy Registrar (A&P)



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Annexure-II

PRE-BID CONFERENCE FOR SUPPLY, INSTALLATION AND COMMISSIONING OF FIXED BED REACTOR.

TECHNICAL QUERIES AND CLARIFICATION

TENDER NUMBER - IISERT/PUR/0485/21

DATE: 31/12/2021

Sr. No	Query/Clarification Sought	Clarification / Amendment
	Chapter 4, Page no-24, point number 2 Two vendors asked for information on the reactor type. Is it downflow or upflow?	Chapter 4, Page no-24, point number 2 It is a downflow reactor. There is no compromise with leak and material balance. The instrument should be leak-proof to avoid any kind of accident and material balance issue. All the parts of the instruments should be adjusted/provided by keeping these in mind. The instrument operation/maintenance manuals are required duplicate. Also, copies of relevant electrical/instrument diagrams are to be furnished.
	Chapter 4, Page no-24, point number 6 Two vendors requested the details for the required fire safety arrangements.	Chapter 4, Page no-24, point number 6 One of the feed gases will be hydrogen and, in some cases, the additional gas/liquid feeds could also be flammable gas/liquids. In addition, the products could be hydrocarbons and/or flammable organic liquids with leftover hydrogen after reaction. So, first of all,



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		there should not be any back pressure and all the required precautions needs to be taken for any kind of fire possibility.
Chapter 4, Page no-24, point number 8A Two vendors enquired about the number of feed inlets.	Chapter 4, Page no-24, point number 8A Three – (1) gas feed inlet, (2) liquid feed inlet and (3) gas and liquid feed inlet (we will use it as our requirement).	
Chapter 4, Page no-24, point number 8A Two vendors asked about the number of MFCs required for the feed gasses.	Chapter 4, Page no-24, point number 8A Five MFCs should be installed for N ₂ (or He), Air, CO ₂ , H ₂ and Propane gas. We recommend Brooks or better quality for these MFCs.	
Chapter 4, Page no-24, point number 8A One vendor enquired about the flow rate of Air.	Chapter 4, Page no-24, point number 8A Selectable within the 10-500 mL/min.	
Chapter 4, Page no-24, point number 8A One vendor enquired about the operating pressure of propane gas MFC.	Chapter 4, Page no-24, point number 8A In case of Propane gas Maximum 9 bar operating pressure is enough for our purpose.	
Chapter 4, Page no-25, point number 8A Two vendors asked about the requirement for liquid flow rate.	Chapter 4, Page no-25, point number 8A Flow rate of pump : 0.1 mL/min to 10 mL/min. Recommended make of pump : Teledyne SSI or better	
Chapter 4, Page no-25, point number 8A Vendors asked about the liquid feed Name, viscosity, density & flow rate required for Pump selection.	Chapter 4, Page no-25, point number 8A We will use different liquid feed (water, alcohols, and other organic liquids) as our requirement. So, it is difficult to mention it at this stage.	



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Chapter 4, Page no-25, point number 8A Vendors asked about the accuracy of the weighing balance.	Chapter 4, Page no-25, point number 8A Max. acceptable range is ± 0.1 gm but we recommend as low as possible.
Chapter 4, Page no-25, point number 8A Vendors enquired about the liquid feed vessel capacity.	Chapter 4, Page no-25, point number 8A 500 mL to 1 litre max.
Chapter 4, Page no-25, point number 8A One vendor asked about the weighing balance make and capacity.	Chapter 4, Page no-25, point number 8A Recommended make of weighing balance: Mettler Toledo or better Capacity : 7.1 Kg, 0.1 g readability
Chapter 4, Page no-25, point number 8A One vendor asked about the requirement of MFCs for liquid flow after pump.	Chapter 4, Page no-25, point number 8A MFC is not required for liquid line at this point of time but there should be provision for future requirement for an MFC. At present, we recommend a HPLC type liquid pump for this purpose. Indeed, this can be adjusted with the high-pressure reactor system, by which we can flow some measured amounts of liquid through the reactor linings. Flow rate of pump: 0.1 mL/min to 10 mL/min; Recommended make of pump: Teledyne SSI or better.
Chapter 4, Page no-25, point number 8B One vendor asked about the material of the reactor tube.	Chapter 4, Page no-25, point number 8B Inconel 625 is recommended by considering our future applications.



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<p>Chapter 4, Page no-25, point number 8B</p> <p>One vendor asked about the required pressure indicators for measuring the pressure difference between inlet and outlet of the reactor tube.</p>	<p>Chapter 4, Page no-25, point number 8B</p> <p>We recommend DPT for the best design for better operation of the reactor.</p> <p>Emerson or better for DPT is highly recommended.</p>
<p>Chapter 4, Page no-25, point number 8B</p> <p>Two vendors enquired about the recommended make for the furnace.</p>	<p>Chapter 4, Page no-25, point number 8B</p> <p>We recommend standard furnace quality like ATS or better. Furnace should come with a standard digital programmable temperature controller.</p> <p>Standard Specification of Furnace:</p> <ul style="list-style-type: none">➤ Split furnace with stainless steel shell and hinge assembly➤ Should be operated at 40 °C to 800 °C➤ Furnace should be made up of Nichrome element with embedded windings➤ Should have two zone heating➤ Electricity power - 1100 watts/4.8 amps @230 VAC, 1 Phase, 50 Hz➤ K type thermocouples for temperature measurements➤ Dimensions: 2 inch ID x 8 inch OD x 10 inch long
<p>Chapter 4, Page no-25, point number 8B</p> <p>One vendor asked about the make of the wet gas meter.</p>	<p>Chapter 4, Page no-25, point number 8B</p> <p>Wet gas meter: Ritter (with resettable LCD display) or better quality is recommended for better performance and reproducibility of results.</p>



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Chapter 4, Page no-25, point number 8C Three vendors asked about the product collection vessel capacity.	Chapter 4, Page no-25, point number 8C 500 mL to 1 litre max.
Chapter 4, Page no-25, point number 8C One vendor asked about the weighing balance make and capacity for the product collection vessel.	Chapter 4, Page no-25, point number 8C Recommended make of weighing balance : Mettler Toledo or better Capacity : 7.1 Kg, 0.1 g readability. Max. acceptable range is ± 0.1 gm but we recommend as low as possible.
Chapter 4, Page no-25, point number 8C One vendor enquired about the liquid level control valve for the bottom of the separator, whether liquid control valve is Manual or automatic?	Chapter 4, Page no-25, point number 8C Manual is fine. Recommended Make: Swagelok or Parker or better quality
Chapter 4, Page no-26, point number 8D One vendor asked about the controlling software version of SCADA.	Chapter 4, Page no-26, point number 8D We recommend the most updated version of SCADA. The control software should be connected with the reaction system <i>via</i> Ethernet. Installation CD of the software should be supplied as a backup for future reinstallations.
Chapter 4, Page no-26, point number 13 One vendor asked about the GC scope.	Chapter 4, Page no-26, point number 13 It is in the IISER scope.
Chapter 4, Page no-26, point number 15	Chapter 4, Page no-26, point number 15



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Vendors asked about the leak detectors for H ₂ and CO.	It is must in point of safety. Recommended make of gas leak detector: Honeywell or better.
Chapter 4, Page no-26, point number 16 One vendor enquired about the make of CO ₂ regulator (Inlet Pressure Range:200 Bar; Outlet Pressure Range: 0.5 to 10 bar)	Chapter 4, Page no-26, point number 16 Along with the reactor setup, vendor should provide suitable high pressure regulators for all the gas cylinders (N ₂ or He, CO ₂ , H ₂ , Air, methane) along with the additional low-pressure CO ₂ regulator (Chapter 4, Page no-26, point number 16). We recommend Druva make or better.
Chapter 4, Page no-27, point number 20 One vendor asked about the inclusion of prices of accessories.	Chapter 4, Page no-27, point number 20 Accessories prices will be considered while evaluating the lowest bid.



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Additional required items:

1. Online Sine Wave UPS (Reputed Brand); Capacity: 6 KVA; Feature: In-built isolation transformer Battery Backup: up to 30 min.
2. Accessories spares for trouble-free operation for 5-years: Thermocouple, Heater coils, Filters, Non-return valve, Rapture disks, Pressure gauges, Rebuilt kit for the pump, Analog and digital I/Os, Three-way valve, Forward pressure regulator, MFC & FVC repair kit, SSR Relays, Nut/Ferrul/Tubing etc, Necessary “O” rings, Filters, Tool-kits such sets of spanners, Screwdrivers, Wrenches etc of the appropriate sizings used in the reactor. Ceramic beads for packing the reactor tube, Soft face hammer to pack and unpack the ceramic beads inside the reactor tube (It should not damage the metal reactor tube), Quartz wool for making the catalyst bed (10 gm packets x 10), Bench vise to open and close the reactor tube fittings before and after the reaction (and to be used for additional external linings with different Swagelok/Parker fitting parts), Allen keys set, Different sizes of Mesh Sieves (20 to 100 mesh size) to make the catalyst pellet for the reaction, Pellet Press.
3. The vendor has to confirm that there should be a continuous supply of spares required for 5 years after the warranty period (post-warranty) for smoothing operations.



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Commissioning & On-site training:

- Commissioning shall be done by Factory trained engineers and an application specialist of the manufacturer's company. Demonstrate test runs for the required operational parameter as well as imparting on-site training operation & maintenance of the equipment (to verify the operation, start-up, leak, and pressure testing, shut down, emergency safety, and normal operation of the unit, control systems, and so forth) to IISER Tirupati Faculty/Technical operator/Students.
- Factory acceptance tests should be conducted before handing over the equipment.
- The requirement of gas regulators, tubings, connectors, air compressure, chiller/water circulator etc. should be provided by the vendor before installation. Visiting R&D site in advance to ensure required infrastructure facilities for successful commissioning of the system without any delay.
- Arranging for replacement of defective parts. If found any, during installation, this replacement should be done within a month's time at the supplier/vendor's cost.
- Detailed P&ID should be provided for bid evaluation and consideration.



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Annexure: III

PRE-BID CONFERENCE FOR SUPPLY, INSTALLATION AND COMMISSIONING OF FIXED BED REACTOR.

COMMERCIAL QUERIES AND CLARIFICATION

TENDER NUMBER - IISERT/PUR/0485/21

DATE: 31/12/2021

Sr. No	Query/Clarification Sought	Clarification / Amendment
01	The deliveries & installation must be completed within 45 days after placement of the purchase order.	The deliveries & installation must be completed within 90 days after placement of the purchase order.