المعهد الهندي للتكنولوجيا دلهي
أبوظبي

INDIAN INSTITUTE OF TECHNOLOGY DELHI
ABU DHABI

Automated Continuous Fixed-Bed Reactor System

(RFQ-IITD AD-PD 25/20)

November 2025

Introduction

IIT Delhi - Abu Dhabi, an epitome of academic excellence, brings the prestigious legacy of the Indian Institute of Technology Delhi to the vibrant landscape of the UAE. With a commitment to innovation, research, and global collaboration, this institution serves as a beacon of knowledge, nurturing brilliant minds and shaping future leaders in engineering, technology, and beyond.

The information contained in this RFP and any related correspondence, documents or discussions is subject to non-disclosure by all bidders. Submission of a response to this RFP does not in any way bind IITD AD to select any vendor for further inclusion in the vendor selection process.

Invitation for Bid Offers

Indian Institute of Technology Delhi - Abu Dhabi invites technical and commercial bid (separate file) from eligible and experienced OEM (Original Equipment Manufacturer) or OEM Authorized Dealer of the following items as per the terms and conditions specified in the bid document, which is available on the procurement page of the IIT Delhi - Abu Dhabi (https://iitdabudhabi.ac.ae/procurement). Bidders are requested to review the bid document carefully to understand the documents required to be submitted as part of the bid. Any deviations from these may lead to rejection of the bid.

Please include lead time, warranty terms, and support options in your quotation. Send the Required Documents along with the proposal document to: procurement@iitdabudhabi.ac.ae

Indian Institute of Technology Delhi - Abu Dhabi is seeking quotations for the supply, and delivery of the following items.

Scope Of Works (SOW) with BOQ

Automated Continuous Fixed-Bed Reactor System- 1 unit with accessories

A fully automated, modular flow reactor system designed for testing and evaluating heterogeneous catalysts under controlled reaction conditions. The system should be suitable for gas/solid, gas/liquid/solid, and gas/vapor phase reactions, kinetic measurements, and long-duration stability studies.

General Specifications:

- Bench-top reactor system capable of operating under continuous flow conditions
- Modular design allowing flexibility in configuration for various catalytic studies
- Fully automated operation with computer-based control and data acquisition
- Capable of maintaining accurate and stable control of overflow, temperature, and pressure.
- Reactor Type: Fixed-bed tubular reactor
- Operating pressure and temperature range from 1 to 100 bar and from 25 to 1000 °C, respectively.
- Minimum of four independent gas lines with respective precision mass flow controllers (MFCs) and fittings, expandable to a fifth gas line.

- Integrated liquid feed module with a precision liquid pump
- Coriolis mass flow sensor integrated with the pump for accurate dosing of liquid reactants into the reactor
- **WO-2006008328 o EP-1757930 US-2008063565** “automated system with universal microreactor high performances”,
- it shall be upgradable with a second reactor, which may operate in serial mode or in parallel mode,
- the standard furnace of the reactor must have radial heating elements to allow to achieve the target temperature very quickly with optimal temperature distribution.
- The thermocouple (1.5 mm diameter, made with Incoloy) must be placed within the catalytic bed.
- wide range of special alloys for reactor material: SS316, SS310, SS347, Hastelloy-C, Hastelloy- X, Inconel 600, Inconel 625, Quartz,

- Automated pressure control valve (patented: **EN-2245239 / WO-2006021603 / EP-1775504 / US-200724129** “servo-positioner for a microregulating valve”), – The pressure control valve shall be a fully automated servo-valve with standard maximum pressures to 100bar (+/- 0.1bar). A stepper motor must control the valve to more than 2800 unique positions for high precision and stability in single- or multi-phase systems. The valve must be able to work simultaneously at high temperatures and pressures (X C at 100bar).
- Versatile gas-liquid separator (patented **S-2249139 / WO-2006021604 / EP-1757911 / US-200723875** “gas-liquid separator comprising a capacitive level sensor”) – The liquid separator shall offer the opportunity to automatically separate, condense, and control the volume of liquids accumulated in the separation vessel based on controlling the temperature via an attached Peltier cell. To enable the system to be used for a wide range of condensates, the separator temperature must range from 5 to 60°C and allow for automated draining via a servo valve with over 2,800 unique positions. The dead volume of the separator must be 1cc or less.
- Liquid-level sensor – To fully automate the system, a continuous capacitance liquid level sensor shall be installed inside the gas-liquid separator. The sensor must be highly sensitive and allow users to detect a volume of condensed liquid down to 0.5mL. The user must be able to collect almost real-time results, which permits the same system to be used for anything from initial reaction kinetic studies to lifetime deactivation.
- Optional multi-phase liquid-level separator (patented **P200930603, PCT/ES2010-070559** “liquid-liquid2-gas separation at real time with no dead volume”). – For gas-to-liquid studies, the system shall be equipped with a separator for the separation, condensation, and control of two non-miscible liquids. Two capacitance liquid level sensors and two servo-valves must be installed on the separator to permit the independent control of both liquid products. Dead volume must be 1.0cc or less.
- Safety – There must be three levels of alarms for the reactor system: hardware, firmware, and software. Hardware alarms must be independent of software. Firmware alarms must be programmed to protect components and must be able to be set to customer lab requirements. Software alarms must be configurable by the customer.
- Optional full incorporation with supplied analytical devices – The software must be able to interface with a variety of supplied external analytical devices and permit via SCADA architecture: triggering of a device, modification of trigger time, incorporation of an analysis report, and online calculation and display of conversion and selectivity data.

- **Data Acquisition and Control:**

  Fully automated operation; Dedicated software for full automation, process control, and data logging
  Real-time monitoring of all process parameters (temperature, pressure, gas, and liquid flow rates)
  Capability to program reaction sequences, temperature ramps, and flow changes
  Data export in standard formats (CSV, Excel, etc.) for kinetic and performance analysis

- **Safety and Protection:**

  Over-temperature and over-pressure protection
  Automatic system purge with inert gas
  Emergency shutdown mechanism
  Pressure relief valves and leak detection system

- **Accessories and Essential Components:**

  Catalyst holders and reactor fittings compatible with the provided reactor tubes
  Calibration and verification tools for MFCs, pressure transducers, and thermocouples
  Communication and control cables

- **Computer system**

  A suitable branded Computer like Dell or Lenovo for system control and data acquisition should be offered with the system. It should have following minimum specs: i5/i7 (14 gen) processor or better, 8 GB SD RAM, 512 SSD, 52 x CDD read/write combo drive, 4 USB Ports, WiFi-5/6 enabled, 17” TFT Color Monitor, 101 Keys Keyboard (wireless), Optical mouse (wireless).

- **Installation and Training:**

  Supplier must provide on-site installation with necessary fittings, commissioning, and operational training.

- **Warranty and Support:**

  Minimum one-year comprehensive warranty from the date of installation.
  Local or regional after-sales service and technical support.

- **Documentation**

  Complete documentation (system manuals, software manuals, operation and maintenance manuals) should be provided in both softcopy and hardcopy formats.

RFP Date and Timeline:

Re Publish date	16 January 2026
Site Visit, if required upon visit	Upon request
Submission date	Soft copy to procurement@iitdabudhabi.ac.ae on or before Thursday 22nd January 2026 **at 15.00PM**

Indian Institute of Technology Delhi - Abu Dhabi is in the process of purchasing the following item(s) as per the details given below.

Item name	**Automated continuous fixed-bed reactor system**
Bid Bond	Not Applicable
Warranty*	
Bid validity*	30 days
Performance security*	
Delivery Schedule*	
Address for Communication	IIT Delhi Abu Dhabi, Khalifa City B, Abu Dhabi, UAE. procurement@iitdabudhabi.ac.ae
Bidder Contact No.*	
Bidder Email Address*	

*To be filled by the Bidder