



Ref: ChE/2019-20/Vs/18

Date: 24 Oct 2019

ANNEXURE-I

DEPARTMENT OF CHEMICAL ENGINEERING  
INDIAN INSTITUTE OF TECHNOLOGY (BHU) VARANASI

ENQUIRY

Due Date: 14 Nov 2019

Date: 24 Oct 2019

Dear Sir,

Please submit your lowest quotation for supplying the under mentioned items. Quotation must reach us before the date marked above and should contain the following information:

1. Full specification and make of the item offered and its rate F.O.R. Varanasi/CIF New Delhi.
2. Sales tax at concessional rate as applicable to educational institution.
3. Your sales tax registration number and TAN number.
4. Conditions of supply and terms of payment.
5. If you are a manufacture of the item or if you have proprietary right over it, please mention it in the quotation and provide a certificate.
6. Please mention your agency commission in Indian currency. If applicable (in case of imported items).
7. Please give undertaking as per annexure-I-B

Quotation must be sent in a **sealed envelope** with word "QUOTATION", our reference number, and due date as given above, clearly marked over it to the address: **Dr. Vijay Shinde, Assistant Professor, Department of Chemical Engineering, Indian Institute of Technology (BHU) VARANASI 221005.**

**Technical Specifications: Fluidised Bed Reactor**

<p><b>1. Reactor and furnace assembly</b> <b>1.1 Reactor: 01 set</b> Type: Fluidised bed reactor Catalyst: Al<sub>2</sub>O<sub>3</sub> (80 µm) Catalyst of weight : 20-30 g Heating Length : whole reactor Operating Pressure: 1 Bar Design Pressure: 5 Bar Operating Temperature : 700 Deg C Design Temperature: 750 Deg C MOC: SS316 <b>1.2. Furnace: 01 set</b> Type: Vertical tubular type Dimensions: Suitable for the reactor dimensions. Operating Temperature: 800 Deg C</p> <p><b>3. Liquid Feed Assembly: 01 set</b> <b>3.1 Feed Vessel: 01 set</b> Capacity: 1 Liter Operating Pressure: Atmospheric</p>	<p><b>2. Gas Feed Assembly</b> <b>2.1 Flow Controller: 03 set</b> Gas: Ar/N<sub>2</sub>, CH<sub>4</sub>/CO/C<sub>3</sub>H<sub>8</sub>, CO<sub>2</sub> Flow : 5-50 SLPH Operating Pressure: 5 Bar Operating Temperature: Ambient <b>2.2 Pre-heater: 01 set</b> Type: Tubular type. Design Pressure: 5 Bar Operating Temperature: 300 Deg C MOC: SS 316</p> <p><b>4. Down Stream Section</b> <b>4.1 Gas solid separator: 01 set</b> Capacity: 1 liter Design Pressure: 5 Bar Operating Pressure: 1 Bar <b>4.2 Condenser: 01 set</b> Type: Spiral Design Pressure: 5 Bar</p>
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भारतीय प्रौद्योगिकी संस्थान  
INDIAN INSTITUTE OF TECHNOLOGY  
(काशी हिन्दू विश्वविद्यालय)  
(BANARAS HINDU UNIVERSITY)

रासायनिक अभियांत्रिकी एवं प्रौद्योगिकी विभाग  
DEPARTMENT OF CHEMICAL ENGINEERING & TECHNOLOGY  
(ऊच्चानुशीलन केन्द्र एवं डी एस टी प्रायोजित 'फिस्ट' विभाग)  
(CENTRE OF ADVANCED STUDY & DST DEPARTMENT UNDER FIST)  
(वाराणसी - 221004) Varanasi - 221005

<p>Operating Temperature: Ambient MOC: Glass <b>3.2 Feed Pump: 01 set</b> Type: Piston Flow Rate: 1-30 ml/h Capacity of tank: 500 ml Operating pressure: 0-5 Bar Operating Temperature: Ambient MOC: SS 316 <b>3.3 Vaporizer: 01 set</b> Type: Tube type Design Pressure: 5 Bar Operating Temperature: Ambient MOC: SS 316</p> <p><b>5. Instruments</b> <b>5.1 Pressure gauge: As per requirement.</b> Type: Bourdon Pressure Range: 0-5 Bar</p> <p><b>5.2 Temperature thermocouples: As per requirement</b> Type: K-type Temperature Range: 0-800 Deg C</p> <p><b>5.3 Differential Pressure regulator: 01 set</b> Pressure: 0-5 Bar</p> <p><b>12. Double stage pressure regulators</b> for the gas cylinders mentioned in 11. (SS Diaphragm, Gauges)</p>	<p>Operating Pressure : 1 Bar MOC: Suitable (preferred SS316) <b>4.3 Gas Liquid Separator: 01 set</b> Type: Closed end on top, torispherical dish end on bottom. Capacity: 1 liter Operating Pressure: 1 Bar MOC: Suitable</p> <p><b>6. Valves</b> Filter (for gas and liquid lines), Isolation Valve (2/3 ways), Needle Valve, Non-Return valve, Pressure safety relief valve etc.: As per requirement. MOC: SS 316</p> <p><b>7. Fittings &amp; Tubing: As per requirement</b></p> <p><b>8. PID based Control Panel</b> Preheater, Reactor's temperature controller, Gas Flow controllers, &amp; pressure indication</p> <p><b>9. Structure: Aluminium/Iron</b></p> <p><b>10. Desktop for data logging</b></p> <p><b>11. Gas Cylinders</b> 10% CH<sub>4</sub> (balance Argon), 10% Propane (balance Argon) and Pure argon gas cylinders filled with UHP gases. Valid Explosive License Certificate for each cylinder. Capacity: 47 ltrs.</p>
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HOD/COS/PI