



# भारतीय प्रौद्योगिकी संस्थान (भारतीय खनि विद्यापीठ), धनबाद

धनबाद, झारखण्ड, भारत, पिन-826004

(मानव संसाधन विकास मंत्रालय, भारत सरकार के अधीन राष्ट्रीय महत्व का एक संस्थान)

INDIAN INSTITUTE OF TECHNOLOGY (INDIAN SCHOOL OF MINES), DHANBAD

DHANBAD, JHARKHAND, INDIA, PIN-826004

(An Institute of National Importance under Ministry of H.R.D., Govt. of India)

STORES & PURCHASE SECTION Phone:(0326) 2235678 || Email : purchase@iitism.ac.in || Website : www.iitism.ac.in

No. M-500283-2017-18

Date: 13 October 2017

## NOTICE INVITING TENDER

### Subject: Supply & Installation of R-70 Test Set UP

Indian Institute of Technology (Indian School of Mines), Dhanbad invites quotations for the following to be supplied and delivered in Mining Department.

S No	Full Description of items/ store	Qty	Delivery
1	<b>Supply &amp; Installation of R-70 Test Set UP</b> (Detailed Specification is given in Annexure – I)	01 Set up	At the Earliest /Ex-Stock

### Tender Schedule

Particulars	Date & Time
Bid Security or Earnest Money Deposit	<b>Rs. 16,000.00 (Sixteen Thousand Only)</b>
Tender Fees	<b>Rs. 500.00 (Five Hundred Only)</b>
Last date and time for submission of tenders	<b>07.11.2017 at 1:00 P.M.</b>
Date and time of opening of tenders	<b>07.11.2017 at 4.00 P.M.</b>

1. You are requested to quote your lowest rates for the supply of above items in the attached format for Financial Bid (Annexure – II)
2. You may send your representative in the office of the undersigned at the scheduled date and time of opening of tender.
3. Tender should be submitted in sealed cover only superscribed with Enquiry No. and due date at the following address only:

*The Deputy Registrar (P&S)*

*Indian Institute of Technology (Indian School of Mines),*

*Dhanbad – 826 004 Jharkhand*



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## Annexure – I

### Technical Specifications and Other Terms & Conditions for Supply and Installation of R-70 Test Set Up

#### A. Technical Specifications of R-70 Test Set Up

The R-70 Test Set Up consists of the following major components:

##### **1. Adiabatic Oven:**

- Stainless steel, double wall, high quality
- The oven and the door are double skinned containing kaowool and high density fibreglass for insulation
- Heating range: up to 250°C or better
- A fan located on the rear internal wall of the heating chamber to ensure efficient temperature distribution inside the oven
- 16 metre long copper tubing coil for gas inlet into reaction vessel inside the oven
- High quality couplings and fittings such as Swagelok or Swagelok compatible
- Oven chamber dimensions: 400x400x400 mm WxDxH
- External dimensions: 600x1150x1600 mm WxDxH
- Power: 230V AC, 50hz, 1.7 kW, single phase
- Fan switch: 0.375 kW, single phase

##### **2. Reaction Vessel:**

- 250 ml stainless steel thermos, fitted into the oven chamber
- Thermos equipped with Teflon composite top plug with perforations for passing through the gas inlet and outlet pipes and the thermocouples, with:
  - ✓ Silicone gasket
  - ✓ Gas (Nitrogen/oxygen) inlet tubes: Copper tubes, inner diameter 3mm, ~150mm long, pointed end for easy insertion through the ground coal sample
  - ✓ Smaller gas outlet tube to be used as an exhaust to collect effluent gas from the coal sample and pass it out of the oven
  - ✓ Spring clamp to hold the Teflon plug in place and prevent gas leakage from the vessel
- 3 thermocouples passing through the Teflon plug fastened at the end of inlet tube.
- The reaction vessel is fitted into the oven base via a support bracket

##### **3. Temperature Controller:**

- PID type such as Honeywell, Sigma, Shimadenor any internationally reputed brand to control the temperature of adiabatic oven. Two modes should be available for the user:
  - Automatic - for constant adjusted SV control
  - Remote - for constant adjustment of the oven temperature = coal sample temperature



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As soon as the sample temperature is stabilised at 40°C, the nitrogen supply stops and the oven is switched to remote monitoring mode and the gas selection switch turned to oxygen with a constant flow rate of 50 ml/min. The temperature change of sample with time is recorded by a data logging system for analysis.

Limit switch cuts off the power and oxygen supply when temperature reaches 180°C. Limit switch temperature can be adjusted to lower value.

#### 4. Set of 6 thermocouples of type K:

Six thermocouples with accuracy  $\pm 2.5K$ .

- 3 thermocouples are fitted inside the reaction vessel
  - ✓ one connected to data logger
  - ✓ one connected to temperature controller
  - ✓ one connected to limit switch
- 2 thermocouples are inside the oven
  - ✓ one connected to data logger
  - ✓ one connected to oven temperature controller
- 1 thermocouple positioned outside the oven to measure the ambient temperature

#### 5. Solenoid valves and limit switch block:

Two solenoid valves are used to:

- cut off gas supply when the limit switch shuts down the power or a power failure occurs
- control nitrogen and oxygen supply within R70 procedure

The limit switch is used to cut off power when the temperature inside the reaction vessel reaches a set limit.

#### 6. Data logger with latest configuration desktop computer:

- Advanced data acquisition system or data logger such as DATA TAKER DT 100 with computer program for recording coal and oven temperatures and store data in a file using a PC and a special data logging program during full R70 test procedure.
- Temperature data is continuously saved during the test in PC computer for analysing the data and plotting the graph.
- The graph should be monitored on the computer screen during the test on real time mode for continuous monitoring of the experiment or later after the test is completed.
- The apparatus should be designed to run unattended and the test should be automatically terminated when the coal temperature reaches that fixed value by the limit switch.

#### 7. Gas cylinders with flow meters and double-stage stainless steel regulators:



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- 47 litres of high purity N<sub>2</sub>, O<sub>2</sub> gas cylinders. Two cylinders each.
  - Two flow meters of maximum flow rate 100 mL/min.
  - Two double-stage stainless steel regulators.
- 8. Gas connection pipeline arrangement** to connect the reaction tube with gas cylinders.
- 9. Cylinder carrier trolley** for carrying the cylinders.
- 10. Humidifier** with relative humidity (RH) meter. For creating and measuring humidity up to 100% RH.

## Quantitative specifications:

Sl. No.	Item	Quantity
1.	Adiabatic oven	01
2.	Reaction vessel	06
3.	Temperature controller	01
4.	Set of 6 thermocouples	06
5.	Solenoid valves and limit switch block	02
6.	Data logger with latest configuration desktop computer	01
7.	Gas cylinders (N <sub>2</sub> & O <sub>2</sub> ) with flow meters and double-stage stainless steel regulators	02 cylinders each for N <sub>2</sub> & O <sub>2</sub>
8.	Gas connection pipeline arrangement	01
9.	Cylinder carrier trolley	04
10.	Humidifier with relative humidity (RH) meter	01

## B. Other Terms and Conditions

- The supplier should provide calibration certificates from accredited labs for thermocouples and flow meters.
- Warranty of total three (03) years on the total set up after its satisfactory installation should be provided by the firm.
- Installation of the equipment and training on site should be provided by the firm at no extra cost.

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## Terms & Conditions

- 1) The rates should be quoted for each item separately.
- 2) Conditional offer will not be accepted.
- 3) IIT (ISM) does not issue any Form 'C' or 'D' towards sales tax concessional rate. Hence, full rate of sales tax/VAT, GST applicable should be quoted.
- 4) **Educational discount**, if any, should be clearly mentioned.
- 5) You are requested to submit your quotation strictly as per the specifications mentioned in the NIT.
- 6) Earnest Money Deposit (EMD) & Tender Fee: Should be submitted in form of A/C payee demand draft drawn in favor of Registrar, IIT(ISM) and payable at SBI, IIT (ISM) campus branch or any other Bank/ Branch located in Dhanbad.
- 7) Your tender must be valid for **minimum 90 days** from the date of opening of tender.
- 8) Please mention warranty/ guarantee in your offer clearly. Material/ equipment to be supplied must have minimum warranty/guarantee of **03 years**.
- 9) Each page in the bid document must be numbered properly and duly signed & sealed by the bidder on every page of the bid.
- 10) **The items/ materials shall be required to be delivered at Mining Department/ Section through Purchase & Store Section, IIT (ISM) Dhanbad** at the risk and cost of the tenderer.
- 11) Unloading and installation shall be the complete responsibility of the supplier.
- 12) The stores are required to be delivered within 30 days. Late delivery may not be accepted.
- 13) The items offered should be of good quality confirming to BIS standards, wherever applicable.
- 14) Successful bidders may have to submit Performance Security (PBG) in the form of Bank Guarantee only as per the Purchase Order as per rules.
- 15) **Advance payment is not admissible**. Payment shall normally be made within 4-6 weeks subject to receipt and acceptance & installation (as per Purchase Order Terms) of the ordered materials/items.
- 16) In the event date on which the tender is opened for acceptance is declared to be a holiday, the tenders shall be deemed to remain open for acceptance till the next working day.
- 17) Please send your offer by Regd. Post/ Speed Post/ Courier along with Courier receipt. Tender/ quotation will be received during IIT (ISM) working hours only (i.e. Monday to Friday). *Late or delayed tenders shall be summarily rejected.*
- 18) Any other information that you may like to obtain, you are free to contact IIT (ISM) before submission of tender.
- 19) IIT (ISM) reserves the right to accept and/or to reject any/ all tenders without assigning any reason.

Deputy Registrar



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## Annexure - II

### Format for Financial Bid

NIT No.: M-500283-2017-18

Date: 13 October 2017

Bidders Ref. No.:

Date:

GSTIN:

**Subject: Supply & Installation of R-70 Test Set Up**

Sl. No.	Full Description of Items (With HSN Code/SAC Code)	Qty.	Rate	Amount
			Packing & Forwarding (if any)	
			<b>Total</b>	
			GST (if any)	
			Freight (if any)	
			Installation (if any)	
	Amount should be in figure as well as word		<b>Grand Total</b>	

#### **Note:**

- 1) All the details must be provided as per prescribed format only
- 2) Prices quoted by the bidders should include all local taxes, VAT, service tax, GST, HSN Code, SAC Code, livies, transportation cost and insurance costs etc. if any
- 3) All the rates must be quoted in Indian Rupees.