



# NATIONAL INSTITUTE OF TECHNOLOGY, DURGAPUR

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**BID REFERENCE:** NITD/CHEMICAL/DST-FIST/2016-17/02

**Date:** 18.01.2017

To

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\_\_\_\_\_

Dear Sir,

**SUB: Invitation for quotations for supply and installation of TGA with interconnected with FTIR under “DST-FIST Grant”**

1. You are invited to submit your most competitive quotation for the item as per technical specification given in **Annexure-I**. Superscribe the cover envelope as “**DST-FIST Chemical – TGA-FTIR**”. Price bid form as per Annexure-II must be filled with complete numerical values. Please note that each item will include sub-items.
2. **Bid Price (Annexure-II)**
  - a) The contract shall be for the full quantity as described above. Corrections, if any, shall be made by crossing out, initialing, dating and re-writing.
  - b) All duties, taxes and other levies payable by the contractor under the contract shall be included in the total price **F.O.R. Dept. of Chemical Engineering, NIT Durgapur**.
  - c) The rates quoted by the bidder shall be fixed for the duration of the contract and shall not be subject to adjustment on any account.
  - d) The bid price may be quoted in **Indian Rupees or in foreign currency (F.O.R. Dept. of Chemical Engineering, NIT Durgapur)**.
3. Each bidder shall submit only one quotation for each item. Manufacturer/authorized dealers of reputed brands of high technical quality with adequate after-sales support facilities are eligible to apply. The bidder must have supplied similar good to reputed organizations to their full satisfaction and furnish a list of the same.
4. **The bid submitted by the bidder must comprise the following:**

#### **Part – I (Techno-commercial Bid)**

- (a) Detailed technical specifications, conforming to the given specifications (vide Annexure – I), and literature /drawings /manuals of the goods/services to be supplied.
- (b) Authorized dealership certificate from the original manufacturer
- (c) Credentials and list of organizations where the bidder supplied similar items
- (d) Satisfaction certificates (in original letterhead) of users of the same instrument working in premier national and state government academic and research institutions and universities
- (e) **Warranty period (36 months comprehensive on-site). An optional additional 24 month comprehensive warranty (after 36 months) must also be quoted for.**
- (f) Valid sales-tax / VAT clearance certificate

#### **Part – II (Price Bid)**

- a) Price bid as per Annexure-II

#### **5. Validity of Quotation**

Quotation shall remain valid for a period not less than **60 days** after the last date of submission.

#### **6. Evaluation of Quotations**

The Purchaser will evaluate and compare the quotations determined to be substantially responsive i.e.

(a) which are properly signed and

(b) Conform to the terms and conditions, and specifications.

(c) **The quotations will be evaluated considering the cost of all mandatory / essential items including tax thereon. Price of each optional accessory needs to be quoted for separately and the additional price for extra 24 month warranty must also be indicated.**

7. **Award of contract**

The Purchaser will award the contract to the bidder whose quotation has been determined to be substantially responsive, technologically acceptable and who has offered the lowest evaluated quotation price.

7.1 Notwithstanding the above, the Purchaser reserves the right to accept or reject any quotations and to cancel the bidding process and reject all quotations at any time prior to the award of contract.

7.2 The bidder whose bid is accepted will be notified of the award of contract by the Purchaser prior to expiry of the quotation validity period. The terms of the accepted offer shall be incorporated in the purchase order.

8. Delivery shall be made at **Department of Chemical Engineering, NIT, and Durgapur.**

9. Payment shall be made immediately within 30 days after satisfactory installation, commissioning and successful demonstration of the good.

10. Comprehensive onsite warranty shall be applicable to the supplied goods for the selected period of **36 months / 60 months** from the date of installation as decided by the purchaser.

11. The Institute is **exempted from payment of custom and excise duty** on items mentioned below:

a) Scientific and technical instruments, apparatus, equipment (including computers)

b) Accessories, spare parts and consumables thereof

c) Computer software, CD-ROM, recorded magnetic tapes, microfilms, and microchips.

12. The successful bidder must submit a valid bank guarantee on any nationalized bank of **10%** of the order value towards **Performance Security** during the warranty period before the release of payment.

13. **Liquidated Damage** will be applicable at the rate of **0.5%** per week. The purchaser has the right to cancel the purchase order when LD accumulates to 10 %.

14. A bank draft of **Rs 200** towards the bid document price payable to "**FIST CHEMICAL**" at Durgapur will be enclosed with the bid by the bidder.

15. A bank draft or bank guarantee worth **Rs 90,000** payable to "**FIST CHEMICAL**" as EMD which shall remain valid for a period of 45 days beyond the final bid validity date.

16. A separate envelop must contain the demand draft for bid document price and draft/BG for EMD, superscribed by "EMD/Bid document price"

17. Quotations are to be submitted in **two separate sealed covers** marked PART-I (Techno-commercial bid) and **PART-II** (Price bid) containing relevant documents, superscripting "**Bid No. NITD/CHEMICAL/DST-FIST/2016-17/02**". These two sealed covers are to be placed in a separately sealed larger cover. It should be superscribed '**Not to be opened before 15.30 hours on 20.02.2017**' on these envelopes.

18. Settlement of any dispute will be made under the jurisdiction of Durgapur Court.

19. You are requested to submit your offer latest by 15.00 hours on **20.02.2017**.

20. The purchaser will open the bids at 15.30 hours on **20.02.2017** in the HOD office of Chemical Engg. Department, NIT Durgapur.

21. The bid document must be signed and sealed and enclosed with the bid as a token of acceptance of all terms and conditions in the bid document by the bidder.

22. The items must be delivered at the respective department within **60 days** from the date of placement of purchase order.
23. A pre-bid conference shall be held in **Dept. of Chemical Engineering, NIT Durgapur** on **02.02.2017** at **3.30 PM**.
24. All other terms and conditions of GFR 2005 of the Government of India will be applicable.
25. **Place of Delivery: Dept. of Chemical Engineering, NIT Durgapur.**
26. **Installation / commissioning / demonstration requirement: Installation, commissioning, complete demonstration and successful running of the instrument must be demonstrated at Dept. of Chemical Engineering, NIT, Durgapur.**
27. **The technical bid and the price bid must be enclosed in separate envelopes properly sealed by the bidder, and submitted inside a cover sealed envelope, failure to do which may lead to cancellation of the bid by the tender committee.**

We look forward to receiving your quotations.

**Head, Dept. of Chemical Engineering.**

**The bid must be addressed to:**  
**Prof. Anup Kumar Sadhukhan**  
**Head, Department of Chemical Engineering**  
**NIT, Durgapur -713209, W.B.**  
**Telephones: + 91-9434788048**

**Technical Specification for TGA with interconnected with FTIR****A. Thermo Gravimetric Analyzer (TGA/DTA)**

Sl No	Item	Specification
1	Temperature Range	From Room temperature to 1000°C or higher with accuracy of at least $\pm 1^\circ\text{C}$ . Sample should follow the programmed temperature up to the maximum range.
2	Furnace	To give stable weight signal
3	Atmosphere	Nitrogen/Air/Oxygen/Carbon Dioxide and other standard gases under static or flow condition. Possibility of a mixture of two sample gasses through two separate rotameters.
4	Sample holders	Easy to exchange type for DTA
5	Heating Rate	Up to 99.99 $^\circ\text{C}/\text{min}$ or more
6	Cooling fan	Automatic on/off for forced convection cooling for furnace
7	Balance Design	Ultra Micro Balance weight change measurements should not be dependent on sample positioning. Thermostated balance housing with auto calibration facility with symmetrical differential top pan.
8	Balance measurement range	Max load of at least 500 mg with 1 $\mu\text{g}$ resolution for complete measurement range.
9	Software	Appropriate software running on MS Windows OS for extensive data acquisition, processing, storage and analysing. The software must have all standard features of TG/DTA data handling capabilities. <ul style="list-style-type: none"> <li>• Mathematical evaluation of derivatives &amp; integrals</li> <li>• Real time analysis &amp; control</li> <li>• Exporting data/graphs to Microsoft Office Excel</li> </ul>
10	Calibration	The system should have facility to calibrate with certified pure metal standard for the full temperature range up to 1000C. <b><i>System should not need recalibration when changing crucible, gases and heating rates.</i></b>
11	DTA Differential Thermal Analysis	Simultaneous DTA measurement.
12	Crucible	Ceramic or Pt/Rh
13	Thermocouple	Pt – Pt/Rh
14	Flowmeter (2 Nos.)	flowmeters for gases with fitted T connector and flexible polyethylene tubing and other accessories
15	Accessories, kits, spares	Standard
16	Connectivity	<b>The instrument must have hyphenation option to connect with FTIR</b>

## FT-IR Spectrometer

Sl no	Item name	Technical specification
1	<b><u>Optical details</u></b>	
	Optical system	Single beam optics
	Beam splitter	Extended range KBr
	Light source	High energy long life (2 years or more) user replaceable source
	Detector	Suitable detector Temperature stabilization with controller
	Interferometer	Michelson interferometer with dynamic Alignment system
2	<b><u>Optical performance</u></b>	
	Wave number range	7,800 to 350 $\text{cm}^{-1}$ or better
	Spectral resolution	0.5 $\text{cm}^{-1}$ or better
	Signal to noise	30000:1 peak-peak 1 minute scan or better
3	Data system and software Processing function	The system must be capable to minimize the effect of atmospheric $\text{H}_2\text{O}$ and $\text{CO}_2$ or inbuilt software to eliminate the effect. Arithmetic operation, normalization, base line correction, smoothing, derivative, data points thinning, interpolation, Wave number-wavelength conversion, time-temperature conversion, point pick, film thickness calculation, data calculation, Fourier transform, atmosphere correction, Spectral analysis, etc.
4	Accessories	Set of KBR liquid cell, demountable cell mount; KBR pellet holder, Rechargeable Kit, other standard accessories
5	Micro-syringe	2 No.s. For IR gas injection
6	Tetler Gas Sample Bag	10 no.s / 1 pack
7	Connectivity	<b>The instrument must have option to be connected with TGDTA</b>
8	Separate port for standalone sample analysis	<b>Connectivity for gas cell/liquid cell for direct introduction of sample (liquid/gas/solid) other than from TGA</b>

### B. Hyphenation connector for product gas transfer line from TGA to FTIR

Sl no	Item name	Technical specification
1	The heated transfer line 1	Properly heated transfer line with temperature controller and regulator and will ensure the transfer of each gaseous component to the IR cell of FT-IR instrument for identification or quantification of functional group of organic component. The system ensures constant gas flow giving optimum separation between time-resolved peaks, and reduced mixing of IR signals.
2	Insulation	Properly insulated transfer line to avoid the Colling of product gas
3	Control unit	Mass flow controller, particle filter, flow smoothing system and ensure no accumulation of heavy components.
4	Others	Vacuum pump with exhaust line; possible software for time resolved

		experiments; device for automatically starting the IR data collection; adjustable adapter to the TGA
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C. Essential Items

- (a) **Suitable branded Desktop PC (Intel i5, 6 MB cache memory, 8 GB DDR4 RAM) with A4 size Laser Jet color Printer.**
- (b) **Branded 5 KVA Online UPS**
- (c) **Tubing, connectors and gas regulator for pure Oxygen/Nitrogen/Zero Air (excluding gas cylinder)**
- (d) **3 KVA online UPS (branded make)**
- (e) **KBr Press for pellet preparation, Mortar Pestle and other necessary items**

**D. Optional Item:**

1	DSC Facility as optional item	Simultaneous DSC measurement for measurement of enthalpy changes. Necessary DSC evaluation software should be supplied as standard.
2	Automatic sample preparation	Znse single-reflection ATR for automatic sample preparation
3	Extended warranty	An optional additional 24 month comprehensive warranty (after 36 months comprehensive on-site )

**PRICE BID****Essential Items**

1	2	3	4		5	6	7	8
Sl. No	Name of the good	Quantity & Unit	Price for each unit		Unit Price	Sales tax/ VAT & other taxes payable [admissible only on col. 4(a)]	Total Unit Price	Total Unit Price (in words)
			Ex-factory/ ex-warehouse/ ex-showroom/ off the shelf	Incidental Services				
			(a)	(b)	(a)+(b)	4(a)]	(5)+(6)	
1	TGA with interconnected with FTIR Including mandatory items and accessories as per specification (sl. No.s A, B, C & D)							

**Additional Prices for Optional Items (must be quoted):**

1	2	3	4		5	6	7	8
Sl. No	Name of the good	Quantity & Unit	Price for each unit		Unit Price	Sales tax/ VAT & other taxes payable [admissible only on col. 4(a)]	Total Unit Price	Total Unit Price (in words)
			Ex-factory/ ex-warehouse/ ex-showroom/ off the shelf	Incidental Services				
			(a)	(b)	(a)+(b)	4(a)]	(5)+(6)	
1	DSC Facility							
2	Additional price for Extended warranty for additional 24 months							
3	Automatic sample preparation system							