Institute of Physics

(An autonomous Research Institute of Dept. of Atomic Energy, Govt. of India)

P.O: Sainik School, Bhubaneswar,
Orissa- 751 005, India

GLOBAL TENDER NOTICE NO.: **03/2010-2011**

Last date of receipt of the sealed quotations: Upto 3 P.M. of 20.09.2010

Sealed quotations are invited from leading manufacturers and / or their accredited associates for supply, installation, testing & commissioning of

1. **X-Ray Detector (Si-Li) & Peltier cool with Amplifier, Power Supply & Electronic cables. – 01 No.**
2. **Fluorescence Up-conversion system with Ti-Sapphire Laser: - 01 No.**
3. **Research grade Vibration Isolated Optical Table for item No. 2 above: 01 No.**
4. **5-Axes Sample Manipulator (with variable temperature stage):- 01 No.**
5. **Micro-processor controlled box/ muffle Furnace- 02 Nos.**

Detailed technical specifications and other terms & conditions for supply of the above items/ equipments can be obtained by downloading the same from the Institute's official website: www.iopb.res.in . All quotations should be submitted in sealed envelopes in two parts separately, i.e. "Technical bid" (Part- A) & "Financial bid" (Part-B). Both the parts should be further sealed in an envelope super scribing the name of the Item. The technical bid will be opened on **22.09.2010**. The price Bid of the only technically qualified bidders will be opened at a later date with prior intimation to the respective bidders.

The Institute reserves the right to accept or reject any or all quotations either in full or in part without assigning any reasons thereof.

DIRECTOR

GLOBAL TENDER No. 03/2010-11

DETAILED TECHNICAL SPECIFICATION

Item No.- 1.

X-Ray Detector (Si-Li) & Peltier cool) with Amplifier & Power Supply & Electronic Cables

1. **Si(Li) detector for X-ray spectroscopy**

(Both Liquid Nitrogen and Peltier Cooled options may be quoted)

System Specifications:

1. Active are: ~30 mm sq
2. Window : ~0.3 Mil Be
3. Resolution at 5.9 keV : 165 eV or better
4. Pre-Amp: Pulsed Optical Feedback (preferable)
5. Dewar (in case of LN2 cooled system): ~7.5 lit capacity
6. Detector mount (For LN2 Based system) Horizontal dipstack or integrated assembly (retractable option may also be quoted in addition to regular one)
7. End cap size: 6 inch or longer for use in beamline work
8. System must be supplied with test report with exact resolution obtained.

Optional items:

1. Power supply

2. Spectroscopy amplifier
3. Set of signal and HV cables

Item No. - 2

ULTRFAST Ti - SAPPHIRE LASER based Fluorescence up-conversion and Time correlated single photon counting (TCSPC) system consisting of the following (specifications as given below). The laser system provided must have enough power to carry out up-conversion and TCSPC measurements near 300 nm using SHG or THG

1. **Tunable Ultrafast Ti-Sapphire Laser with a suitable pump laser and Harmonic generator (SHG+THG)**

    - Integrated computer controlled fs system
    - Wavelength tunability: Should cover 720 - 920 nm
    - Pulse width: < 200 fs across the tuning range (as above)
    - Output power: > 500 mW at 800 nm and > 400mW at 720 nm (power must be enough to carry out up-conversion measurements around 300-350 nm)
    - Spatial mode: TEM00.
    - Repetition rate: > 50 MHz
    - Polarization: > 100:1 (vertical or horizontal)
    - Active feedback mechanism for maintaining the frequency & power stability, in case needed

    Integrated Pump Laser

    - Diode pumped solid state Green laser (DPSS)
    - Pump power: Suitable for generating above mentioned desired output from the oscillator.
    - Low output noise & high power stability
    - Should be accompanied by a suitable chiller and power supply (both air and water cooling options may be quoted)
    - Should be maintenance free

Harmonic Generator (SHG+THG)

- Compatible with the tunable ultrafast Ti-Sapphire laser (item# 1)
- Pulse width: < 200 fs (for SHG) ,< 300 fs (for THG)
- Wavelength tunability: In accordance with the specification of Ti-Sapphire laser in item #1 above

2. (Up-conversion + TCSPC) Spectrometer:

- Complete computer controlled integrated unit
- Easy switching from Up-conversion to TCSPC mode and vice-versa desirable
- Spectral range (Up-conversion mode): Must cover 350 – 1600 nm
- Double subtractive monochromator would be preferred
- Intrinsic Time resolution (Up-conversion mode) < 200 fs
- Time window (Up-conversion) : > 3 ns
- Spectral range (TCSPC mode): Suitable spectral range to cover 300-800 nm (with more than one detector option, if required).
- Time resolution (TCSPC mode): 200 ps or better
- Movable sample manipulator and necessary optics for both reflection and transmission measurements with solids and liquid samples.
- UV-IR camera for precise optical alignment and adjusting the delay lines if required.
- PC system with all necessary software for control and analysis (with all details of documentation and working as well as repair manuals wherever required)
- Output data should be available in a format for easy processing using common software such as Excel, Origin etc. Details of software showing analysis capabilities must be provided.

Optional items:

3. Diagnostic kit

- Power measurement range: Should cover 10 mW - 3 W (Suitable for item #1)
- Wavelength range: Should cover 200 - 920 nm.

4. **Research-Grade Vibration-Free Optical Tables + Isolation Systems (Stands)**

- Width: 1500 mm; Length: 3000 mm; Thickness: > 300 mm would be preferable.
  (Any other suitable size with adequate working space would be acceptable)

Desirable features

- Working surface: Ferromagnetic surface stainless steel
- Core design: High-density “honeycomb” design with vertical bonding between the cells
- Hole-to-Hole spacing: 2.5 cm
- Mounting hole pattern: M6 (Metric) on 2.5 cm spaced centers
- Flatness: < 0.004 inch over any area of 500 mm2
- Broadband and/or tuned damping feature should be available
- Dynamic Deflection coefficient: < 1.0 x10-3 on heavy loading
- Negligible table motion on heavy load
- Maximum load capacity: > 2000 Kg
- Self-leveling isolators
- Height: 60–80 cm
- Height adjustment range: ±1.0 mm
- Maximum air-pressure: > 50 psi

5. **Suggested spares**

For five years of trouble free operation

6. **The following should also be a part of technical specifications:**

- The complete system should operate using 220 VAC at 50 Hz (system with auto-ranging facility to run using 110-220 VAC may be quoted)

- Vendor will provide evidence of supplying several similar fs laser systems (item #1) to Indian research laboratories (for compatibility with Indian conditions, better stability and after sales services).
- Details of specifications of detectors used for up-conversion and TCSPC must be provided.
- Vendors should also have regular service offices in India.
- It will be desirable to procure all items (at least items 1,2, & 5) from a single vendor to avoid any compatibility problems.
- Vendor will specify comprehensive warranty period, maintenance procedure, after sales service and related 'terms & conditions' clearly.
- Warranty period of 2 years is desirable for all items.
- Vendor will provide complete free of charge installation and training and on-site service and maintenance within the entire warranty period from the date of installation.
- Vendors must also provide documents and technical service manuals for all electronic items for maintenance and services as may be required later.
- On-site maintenance should be carried out by factory-trained engineer/ technical people preferably with a minimum of 5 years of experience with all parts and labor.
- Vendor will supply complete technical details for the quoted items.
- Vendor will provide information regarding delivery time and Installation.
- Vendor will provide a technical compliance list with the technical bid.

Item N.- 3:

Research Grade Vibration Isolation Optical Table suitable for the above Ti-Sapphire Laser system:

Item N.- 5:

Single Zone Tube Furnace with Vacuum Pump and Gas Control system:

I. Single Zone Tube Furnace with Vacuum Pump and Gas Control system

Item	Parameter	Bidder's specification
Power	2.5 KW	
Voltage	AC 220-240 Single Phase, 50 Hz	
Max. Temperature	1200 deg. C	
Continuous Temp.	1100 deg. C	
Max heating rate	<= 20 deg. C /min	
Temp. accuracy	± 1 deg. C	
Tube size & material	Quartz tube: OD: 80mm × ID: 75 mm × Length: 1000 mm	
Heating element	Fe-Cr-Al Alloy doped by Mo	
Temp. Controller	Precision temperature controller (should be possible to be interfaced) PID precision control by PWM solid relay / microprocessor 30 segments programmable for any temperature profile Built in protection for overheated and broken thermal couple	
Vacuum Pump	Rotary Vane High Speed Vacuum Pump with max. vacuum pressure of 10^{-2} torr or better. Stainless steel hose should be included for connecting to tube furnace.	
Vacuum sensor and display	Vacuum sensor should be installed to vacuum flange of tube furnace, and connect to a digital vacuum pressure display gauge which should have provision to be fitted in the frame Display range should be clearly mentioned	
Gas Flow meter and pressure meter	1.Three gas flow-meters (4% accuracy FS) should be mounted inside the frame-on-wheels which should be able to monitor three different kinds of gas 2. Four pressure meters should be mounted inside the movable frame which should be able to monitor three types of flowing gas pressures & pressure of mixing tank	
Valve	Four stainless steel valves should be installed inside the panel of the movable frame to control mixing gases and three inlet gases separately	

II. Three Zone Alumina Tube Furnace with Vacuum Flanges

Item	Parameter	Bidder's specification
Power	7.5 KW (65 A air breaker required)	
Voltage	AC 220-240 Single Phase, 50Hz	
Max. Temp. (º C)	Zone one: 1400℃, Zone two: up to 1800℃, Zone Three: 1400℃	
Max heating rate	10º C /min	
Normal heating / cooling rate	5º C /min	
Tube Size and Flange	Alumina tube (purity 99.8% or better) should be included 60 mm O.D.× 54 mm I.D. × 1200 mm Length 60 mm stainless steel vacuum sealing flange with valve and meter to be included Porous ceramic blocks to be included for protecting flange from heating Vacuum pressure should be achievable up to 10^{-4} Torr with vacuum pump **(no diffusion pump)** Provision for flowing gas to be there	
Heating Zone and heating element	Three zones: total 25" (630 mm) heating zone (should include two refractory separators) Zone 1: 7.5" (190 mm) heating by SiC Working temperature 800-1400 °C	

	Max. Heating rate: 20 °C/min Zone 2: 10" (250 mm) heating by $MoSi_2$ Working temperature 800 up to 1800 °C Max. Heating rate: 10 °C/min Zone 3: 7.5" (190 mm) heating by SiC Working temperature 800 - 1400 °C Max. Heating rate: 20 °C/min	
Temp. Controller	Two Digital Controllers with microprocessor-based PID control and self-tuning Each one has to be programmable with protection for overheated and broken thermo-couples PID automatic control	
Temp. accuracy	± 1℃	

Accessories:

A. Movable frame for the Box Furnaces
Max. Dimension: 600 mm (L) × 600 mm (W) × 597 mm (H)

B. Compact Digital Vacuum Gauge & Controller with Power Supply (for the high temp. furnace: Up to 1E-4 Torr (compatible to the 1700
Features:

1. Pirani gauge module with on-board controller.
2. Wide measurement range: 10^{-4} to 1000 Torr
3. Bright LED digital display with measurement unit torr /m torr
4. Should include built-in digital display, set-point relay, analog output.
5. Small Foot-Print. with 1/8"NPT fitting -- 48 mm diameter in front face x 104 mm Length
6. 9 pin- D connector

C. Temperature Control System for controlling furnace by using computer

Temperature Control System should set up a communication between the computer and the furnace so that the customer can control and monitor the furnace temperature in real time. It should include:

- One control module.(to install on the controller PCB)
- One USB to Serial port cable (Computer - Serial port)
- One Serial port to Controller cable (Serial port - Controller)

- One disc to have temperature control software and USB to RS485 driver compatible with windows XP/Vista.

Number of temperature control systems to be mentioned clearly.

Warranty:

1 year from the date of installation.

List of institutes where similar furnaces have been supplied.

Authorization letter from the principal should be attached along with the bids.

Comparative statement in the form of filling up the blank column against our specifications is mandatory for all bidders failing which will lead to cancellation of the bid.

Commercial Terms & Conditions: -

1. **Price**: - The price mentioned above is Ex-Works/ FCA separately including export packing (Air worthy) charges (this does not include the appropriate taxes).
2. **Destination**: - The consignment should be sent to **"**The Director, Institute of Physics, P.O. Sainik School, Bhubaneswar-751005, INDIA**"** on freight to pay (payable in Indian Currency) basis.
3. **Delivery**: - Delivery of the consignment should be made within ----------weeks from the date of issue of Letter of credit (L/C) either revocable or irrevocable.
4. ****Payment**: - ***The payment will be released against irrevocable Letter of Credit (LC). You are required to issue an order confirmation letter in order to establish the L/C. 90% of the L/C value will be released on delivery of the consignment & balance 10% will be released after successful installation & commissioning of the equipment against submission of Performance Bank Guaranty (PBG) of equivalent amount (10%) valid for the warranty period and acceptance protocol signed by both the parties (supplier / it's authourised representative & buyer (IOP)). All Bank Charges towards Confirmation of the LC, if required, will be borne by the supplier.***
5. ***Bank Charges:- All bank charges(except confirmation charges) inside India will be borne by the Institute & outside India will be borne by the***

supplier. If The LC confirmation is required by the supplier, the total confirmation charges will be borne by the beneficiary (supplier).

6. **Bank Guaranty**: - You are required to submit a Performance Bank Guaranty equivalent to 10% of the equipment cost, valid for the entire warranty period issued by a nationalized Bank in favour of “Director, Institute of Physics, Bhubaneswar.
7. ****Details of the Consignment**: - You are required to submit the details of the consignment such as weight of the equipment, dimension of the packing & number of packets etc. at the time of order confirmation.
8. **Freight forwarder**: - The Institute will appoint the freight forwarder for forwarding & custom clearing of the consignment at the customs. The name of the freight forwarder will be intimated to the supplier at the time of opening of the L/C.
9. **Insurance**: - The transit Insurance of the consignment covering all risks and damages will be arranged by the Institute of Physics or its freight forwarder, duly authorized by the Institute.
10. **Warranty**: - The equipment should be warranted for a period of --------- months from the date of successful delivery / commissioning at Institute’s site. The necessary warranty certificate in this effect should be furnished along with the supply/ commissioning of the equipment. Spare parts in warranty period are required to be replaced on DDP (Destination Duty Paid) basis.
11. **Documents**: - The despatch documents along with the signed invoice copy & the copy of the airway bill (2 copies each) should be despatched through courier / faxed to the Institute immediately after the equipment is handed over to the freight forwarder.
12. **Operational Manual**: - You are required to supply the operational manual of the equipment, circuitry diagrams etc. written in English only along with the consignment.
13. **Spare parts Manual**: - You are required to supply the operational manual of the equipment; circuitry diagrams etc. written in English only along with the consignment.
14. **Essential Spares/ consumables: -** Essential spares & Consumables along with the price list applicable for a period of 3/5/10 years are required to be supplied with the equipment & to be quoted separately.

15. **Shipment**: - Partial will not be strictly allowed.
16. **Agency Commission**: - No agency commission will be paid to any body / organization for this purchase.
17. **Banker**: - Our banker is Indian Overseas Bank, 121, New Station Square, Unit III, Bhubaneswar- 751001, INDIA. You are required to specify the Banking details such as A/c No, SWIFT code, Branch Code, name of the Bank etc. in order to release the payments.
18. **Training**: -
19. **Service support: -**
20. **Preventive Maintenance**: -
21. **Pre-Delivery Inspection:**
22. **Acceptance**: - If the terms & conditions mentioned above are acceptable to you, you are required to send the order confirmation letter along with a copy of this purchase order & details of consignment to the Institute within 02 weeks from the date of issue of the P.O. as a token of your acceptance.

DIRECTOR