

 <p>IIT PALAKKAD</p>	<p>भारतीय प्रौद्योगिकी संस्थान पालक्काड  <b>Indian Institute of Technology Palakkad</b>  अहलिया एकीकृत कैम्पस, कोज़िपारा  Ahalia Integrated Campus, Kozhipara  पालक्काड- 678557  Palakkad – 678 557</p>	<p>दूरभाषसंख्या/ Phone no:  04923 – 226 300/590/586</p> <p>ईमेल/ Email :  purchase@iitpkd.ac.in</p>
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Prof. Job Kurian  
Registrar i/c

Ref : Laser Diagnostic Equipment  
Date : 17.01.2018

**Open Tender No: IITPKD/MECH/KSG/103/2017**

**Due Date: 07.02.2018 @ 2.00 PM**

Dear Sir/Madam,

On behalf of the **Indian Institute of Technology, Temporary campus, Palakkad, Quotations are invited for “ Laser Diagnostic Equipment”**. The Specifications are given in the Annexure.

**Technical bid Opening: The Technical bid will be opened on 07.02.2018 @ 2.00 PM at Conference Room, Academic Block, IIT Palakkad.**

**Instructions to the Bidder**

- (i) **Preparation of Bids:** - The tenders should be submitted **under two-bid system (i.e.) Technical bid and Financial bid in separate envelopes**. The technical bid should consist of all technical details along with commercial terms and conditions. No prices should be included in technical bid. Financial Bid should indicate item – wise prices for the items mentioned in the technical bid. The technical and the financial bids should be put in separate covers and sealed. Both sealed covers should be put into a bigger cover. **Bids must either be spiral bound / stapled together. No loose sheets will be accepted. All pages must be numbered.**
- (ii) The Quotations duly sealed and superscribed on the envelope **with the reference No. and due date, should be addressed to the undersigned so as to reach on or before the due date stipulated above.**
- (iii) **Delivery of the tender:** - The tender shall be sent to the below-mentioned address either by post or by courier so as to reach this office before the due date and time specified in the Schedule. The offer/bid can also be dropped in the tender box on or before the due date and time specified in the schedule. **The tender box is kept in the office of the Academic Block, IIT Palakkad, Ahalia Integrated Campus, Kozhipara, Palakkad-678 557.**
- (iv) **Opening of the tender:** - The offer/Bids will be opened by a committee duly constituted for this purpose. The technical bids will be opened first and will be examined by a technical committee which will decide the suitability of the bid as per our specifications and requirements. The bidders will be invited for opening of Technical bids. **The Bidder's**

representative should carry authorization letter from their company empowering them to participate in the Pre-bid and tender opening meetings. In respect of opening of financial bid, those bidders who are technically qualified only will be called.

- (v) **Prices:** - The price should be quoted in nett per unit (after breakup) and must include all packing and delivery charges indicated separately for each item. *The price indicated should be CIF/CIP Kochi.* The offer/bid should be exclusive of taxes and duties, which will be paid by the purchaser as applicable. The price should be quoted without custom duty. **The custom duty will be paid at concessional rate against duty exemption certificate.**
- (vi) **Agency Commission:** - Agency commission, if any, will be paid to the Indian agents in Rupees on receipt of the equipment and after satisfactory installation. Agency Commission will not be paid in foreign currency under any circumstances. The details should be explicitly shown in Tender even in the case of 'Nil' commission. The tenderer should indicate the percentage of agency commission to be paid to the Indian agent.  
**Terms of Delivery:** - The item should be supplied to our Institute as per Purchase order. The installation and commissioning should be completed as specified by us in the attached schedule.
- (vii) **Acceptance & Rejection:** IIT Palakkad reserves the full right to accept / reject any tender at **any** stage without assigning any reason.

Yours sincerely,

**Registrar, IIT Palakkad**

## SCHEDULE

### Important Conditions:

- 1) The due date for the submission of the tender is **07.02.2018 @ 2.00 PM**
- 2) The offers / bids should be submitted in two-bids systems (i.e.) Technical bid and financial bid. The Technical bid should consist of all technical details / specifications only. The Financial bid should indicate item-wise price for each item and it should contain all Commercial Terms and Conditions including Taxes (separately), transportation, packing & forwarding charges, installation, guarantee, payment terms, pricing terms etc. The Technical bid and financial bid should be put in separate covers **superscribed clearly as "Technical Bid" and "Financial bid"** and sealed. Both the sealed covers should be put in a bigger cover. Open Tender for **"Laser Diagnostic Equipment"** should be written on the left side of the Outer bigger cover and sealed.
- 3) **EMD: -EMD should be at 2% (two percent) of the tender value quoted by the bidder.** The EMD should be enclosed with the financial bid which will not be opened for Technical evaluation. **Enclosing the EMD in the Technical bid will automatically DISQUALIFY the tenderer.** EMD should be in the form of DD in favour of **"Indian Institute of Technology Palakkad" and payable at Palakkad"**. The tender without EMD would be considered as UNSOLICITED and will be REJECTED. Photo/FAX copies of the Demand Draft/Banker's pay orders will not be accepted. No interest will be paid for the EMD and the EMD will be refunded to the successful bidder on receipt of Performance Security.
- 4) **Performance Security:-** The successful bidder will be asked to submit Performance Security for an amount of 5% of the value of the contract/supply. The Performance Security may be furnished in the form of an Account Payee DD or FD Receipt from the commercial bank or Bank Guarantee from any nationalized bank of India. **Only after submission of Performance Security, Purchase Order/Work Order will be released / L.C will be opened.**
- 5) **Performance Security in the form of Bank Guarantee:-** In case the successful bidder is a foreign company and wishes to submit Performance Security in the form of Bank Guarantee, the Bank Guarantee should be routed through the Beneficiary Bank to the end user bank. Otherwise, the Indian Agent of the foreign vendor has to submit a Bank Guarantee from a Nationalized Bank of India.
- 6) The Bank Guarantee should remain valid for a period of sixty days beyond the date of completion of all contractual obligations of the supplier including the warranty obligations.

If an Indian agent is involved, the following documents must be enclosed:

- Foreign principal's proforma invoice indicating the commission payable to the Indian Agent and nature of after-sales service to be rendered by the Indian Agent.
  - Copy of the agency agreement with the foreign principal and the precise relationship between them and their mutual interest in the business.
- 7) The offer/bids should be sent only for **a system or equipment** that is available in the market and supplied to a number of customers. A list of customers in India and abroad with details must accompany the quotations. Quotations for a prototype machine will not be accepted.
  - 8) Original catalogue (not any photocopy) of the quoted model duly signed by the principals must accompany the quotation in the Technical bid. No prices should ever be included in the Technical bid.
  - 9) Compliance or Confirmation report with reference to the specifications and other terms & conditions should also be obtained from the principal.
- 10) Validity:** Validity of Quotation not less than 90 days from the due date of tender.
- 11) Delivery Schedule:-** The tenderer should indicate clearly the time required for delivery of the item. In case there is any deviation in the delivery schedule, liquidated damages clause will be enforced or penalty for the delayed supply period will be levied.
- 12) Risk Purchase Clause:-** In the event of failure of supply of the item/equipment within the stipulated delivery schedule, the purchaser has all the right to purchase the item/equipment from other sources on the total risk of the supplier under risk purchase clause.
- 13) Payment:-** No Advance payment will be made for Indigenous purchase. 100% Payment after supply and successful installation and commissioning and certification by the end user. In case of import supplies the payment will be made only through **100% Letter of Credit i.e. (50% payment will be released against shipping documents and 50% after successful installation and meeting acceptance criteria wherever the installation is being done).**
- 14) On-site Installation:** - The equipment or machinery has to be installed and commissioned by the successful bidder within 15 to 20 days from the date of receipt of the **item at site of IIT Palakkad.**
- 15) Warranty/Guarantee:** - The offer should clearly specify the warranty or guarantee period for the machinery/equipment. Any extended warranty offered for the same has to be mentioned separately. (For more details please refer our Technical Specifications).

**16) Late offer:** - The offers received after the due date and time will not be considered. The Institute shall not be responsible for the late receipt of Tender on account of Postal, Courier or any other delay.

**17) Loading and unloading charges will be borne by the bidder/Supplier.**

**18) Acceptance and Rejection:** - I.I.T. Palakkad has the right to accept the whole or any part of the Tender or portion of the quantity offered or reject it in full without assigning any reason.

**19) Do not quote the optional items or additional items unless otherwise mentioned in the Tender documents / Specifications.**

**20) Disputes and Jurisdiction:** - Any legal disputes arising out of any breach of contract pertaining to this tender shall be settled in the court of competent jurisdiction located within the city of Palakkad in Kerala.

**21) All Amendments, time extension, clarifications etc.,** will be uploaded on the institute website only and will not be published in newspapers. Bidders should regularly visit the above website to keep themselves updated. No extension in the bid due date/ time shall be considered on account of delay in receipt of any document by mail.

**Acknowledgement:-** It is hereby acknowledged that the tenderer has gone through all the conditions mentioned above and agrees to abide by them.

**SIGNATURE OF TENDERER  
ALONG WITH SEAL OF THE  
COMPANY WITH DATE**

Item No.	Description and specification	Quantity
	Planar laser induced fluorescence (PLIF) and Particle image velocimetry (PIV) system consisting of	
i	<p>Nd: YAG laser with 1064 nm(<math>\omega</math>), 532 nm(<math>2\omega</math>), 355 nm(<math>3\omega</math>), 266 nm(<math>4\omega</math>) harmonic crystals in modular housing with power unit</p> <p>Repetition rate: 10 Hz</p> <p>Minimum energy (mJ/pulse): 400mJ or higher @ 532 nm</p> <p>Beam diameter &lt; 10 mm</p> <p>Beam pointing stability: <math>&lt;\pm 50 \mu\text{rad}</math></p> <p>Beam divergence: <math>&lt;0.5 \text{ mrad}</math></p> <p>Lamp lifetime: 30 million pulses or higher</p> <p>Linewidth: <math>&lt; 1 \text{ cm}^{-1}</math></p> <p>Timing jitter: <math>\leq 0.5 \text{ ns}</math></p> <p>Pulse width: 5 ns or less (532 nm)</p> <p>Short term energy stability: <math>\pm 4\%</math> or better (532 nm)</p> <p>Long term power drift: <math>\leq 5\%</math> (532 nm)</p> <p>Voltage: 230-240 V, Single phase, 50 Hz</p> <p>Cooling: Air/Water cooled. Quote for Chiller separately if needed.</p> <p>Remote panel and software based control</p> <p>Laser CLASS 4</p> <p>Please specify if this requires any Export License</p>	1 No.
ii	<p>Tunable pulsed dye laser with frequency doubling unit (doubling crystal, compensator and wavelength separator) and holographic grating</p> <p>Optimized for pump wavelength: 532 nm (400 mJ or higher)</p> <p>Doubling unit output wavelength range: Suitable for NO, OH and CH PLIF (typically 220-266 nm &amp; 275-400 nm)</p> <p>Grating: 2400 lines/mm</p> <p>Grating wavelength range: 200-900 nm</p> <p>Line width: <math>0.08 \text{ cm}^{-1}</math> or better</p> <p>Absolute wavelength accuracy: <math>&lt;15 \text{ pm}</math></p> <p>Wavelength resetability: 5 pm or better</p> <p>Wavelength stability: <math>&lt;1.5 \text{ pm}/^\circ\text{C}</math></p> <p>Divergence: 0.5 mrad or better</p> <p>Scan linearity: 2 pm or better</p> <p>Polarization: Vertical (<math>\geq 98\%</math>)</p> <p>ASE: <math>&lt;0.5\%</math></p> <p>Typical energies: <math>\sim 25 \text{ mJ}@283 \text{ nm}</math></p> <p>Voltage: 230-240 VAC, Single Phase, 50 Hz</p> <p>Interface: USB, RS232</p> <p>Software module for control of output wavelength, automated excitation wavelength scan etc.</p> <p>Dye crystal starter kits for OH, CH and NO to be provided</p> <p>Please specify if this requires any Export License</p>	1 No.

iii	<p>Dual cavity Nd:YAG laser for PIV with power unit  Output wavelengths: 532 nm &amp; 355 nm (optional, quote separately)  Repetition rate: 15 Hz per head  Min Energy (mJ/pulse): 200@532 nm  Pulse-Pulse stability: <math>\pm 2\%</math>  Beam diameter: 6.5 mm  Beam divergence: <math>\leq 4</math> mrad  Pulse length: <math>\leq 10</math> ns @1064 nm  Pointing stability: <math>&lt; 100</math> <math>\mu</math>rad  Resonator type: stable  Lamp life: <math>&gt; 50</math> million pulses  Timing jitter: <math>&lt; 0.5</math> ns  Supply voltage: 230-240VAC, 50 Hz, Single phase  Laser guide arm: to direct laser beam to experiment. 1.8 m with mounts- Quote as optional</p>	1 No.
iv	<p>Light sheet optics for UV-Vis  Wavelength range: 280-800 nm or better  Continuously adjustable focus: 0.3-4 m or better  Three different Cylindrical lenses for three different divergence angles between 5-30° or f = -10, -20 and -50 mm</p>	1 set
v	<p>Laser beam collimator UV-Vis for parallel beam sheet with mounting provision for light sheet optics  Wavelength range: 280-800 nm  For use with divergent laser sheet  Max sheet height: 50 mm</p>	1 No.
vi	<p>Pump beam optics  for guiding pump laser beam to dye laser: 2 nos.  High damage threshold and high reflectance  Rigid housing with adjustable mirror holder  Wavelength: 532 nm &amp; 355 nm</p>	1 set
vii	<p>CCD Camera with dual frame capability  12 bit output  High quantum efficiency and low noise background  Separation time between two frames <math>\leq 600</math> ns  Resolution: 4 Megapixel or higher  Pixel size: 8 <math>\mu</math>m x 8 <math>\mu</math>m or less  Frame rate: <math>\sim 14</math> frames/s @ full resolution or higher  Gigabit ethernet/cameralink/USB3 interface, (Interface PC card and cables included)  Included Camera lens: 50 mm F/1.8  UV camera lens: 100mm F/2.8 or better</p> <p>532, 355 nm bandpass filters with max transmission (<math>&gt; 90\%</math>) in bandwidth (FWHM=10nm) region – 1 No. each - Quote as optional  OH, NO and CH LIF bandpass filters with high transmission (<math>\sim 80\%</math>) in bandwidth region (FWHM=10nm) – 1 no. each –</p>	1 no.

	Quote as optional Camera mount – quote as optional	
viii	Image intensifier module Interface capability with CMOS and CCD cameras, specifically with camera quoted under (vii) above 2:1 lens coupling High voltage supply Repetition frequency: ~2 kHz or better Gain and gate control Min gate width $\leq 100$ ns, external controller for gate and delay S20/25 photocathode, P20/P43/P46 phosphor, Decay time of Phosphor screen in ms range Please specify if this requires any Export License	1 no.
ix	Software Hardware control software, image acquisition and processing capabilities included. 64-bit, Convenient user-interface. Data display, image processing, calibration, data import and export (multiple formats i.e, BMP, JPG, TIF etc) capabilities. Specific processing modules for laser induced fluorescence (LIF) image processing, Particle image velocimetry (PIV), Imaging. Dye laser operation and synchronization software integrated. All hardware described in (i-iii, vii-viii, xi-xii) must be controllable with the provided software.  PC with original software described above and genuine compatible Windows OS 21" monitor, 6 core processor, latest HDD (2 TB hard disk), 8 GB RAM, graphics card, keyboard, mouse, interface PC slot and card	1 license
x	Synchroniser Laser, camera and other accessories trigger pulse synchronization module Must have sufficient output channels for controlling all hardware Trigger pulse timing controllable using software described in 1(ix) Trigger cables (BNC) included	1 no.
xi	Online energy monitor – Quote as optional For measuring laser pulse energy variation at upto 200 Hz repetition rate. Suitable for UV-Vis with proper diffuser plates	1 No.
xii	Laser shutter – Quote as optional For stable use of laser in UV Controllable using TTL input pulse from timing generator Suitable for 532, 355 nm	1 no.



xiii	Laser energy/power meter With two measurement heads and display unit Suitable for 190-1100 nm wavelength range Min power: 0.1 mJ/pulse in UV range Max power: 10 W continuously	1 no
xiv	PIV solid particle seeder Suitable for handling particles of size 1 micron (Titania/Alumina) Titania/Alumina seed particles to be provided Max pressure: 5 bars or higher Flow rate: Min. 50 l/h	1 no.

## **Who Can Participate ?**

### **Terms and conditions**

- 1) The bidder must provide detailed specifications of each equipment/item in addition to specifications mentioned in the table. Model numbers, data sheets and brochures must be included for each quoted equipment, system and all accessories
- 2) Compliance sheet for the specification and OEM brochure has to be attached along with the technical bid. The bidder has to fill the compliance sheet and mention page numbers or reference number in OEM brochure. Unfilled / partially filled sheets will lead to summary rejection/disqualification
- 3) The bidder must also specify clearly the scope of IIT Palakkad and the bidder with regards to the shipping, customs clearance, local transportation, site preparation and installation.
- 4) The bidder must have supplied to other centrally funded institutions namely IITs/IISc/IIST/IISERs/National Laboratories/Government of India research centres in India, similar equipment within the past 3 years for a total order value exceeding INR 75 lakh. Details and documentary evidence of the equipment supplied, the contact person (indenter/user/in-charge) in said institution shall be provided.
- 5) The bidder must preferably be the manufacturer (OEM) of the equipment supplied. If, however, the OEM does not have such capability in India, sole distributors of the equipment/systems may quote. In such a case, the vendor shall produce documentary evidence of being the sole distributor/subsidiary of the OEM.
- 6) In addition, the bidder should be a company registered under Companies Act., 1956/2013 OR a Limited Liability Partnership (LLP)/a registered partnership firm OR a sole-proprietorship entity. Appropriate registration incorporation certificate is to be submitted.
- 7) The vendor must have a registered office and service center in South India (Karnataka/Andhra Pradesh/Telangana/Tamilnadu/Kerala) with trained personnel. Details of the same must be provided
- 8) The vendor must quote for all the sub-items indicated in the specifications except optional items to be eligible for consideration.
- 9) The vendor must provide complete details of warranty. Warranty included in the quoted price must be clearly mentioned and any additional warranty must be specified as optional with prices.  
**Quote for two years warranty.**
- 10) Additional charges if any for system integration, testing, installation, training, packaging, document handling, freight forwarding must be indicated for the items quoted.