



CSIR - NATIONAL PHYSICAL LABORATORY

(Council of Scientific & Industrial Research)

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Subject : Invitation of Expression of Interest for Laser Interferometer

CSIR-National Physical Laboratory, New Delhi is one of the earliest national laboratories set up under the Council of Scientific & Industrial Research. CSIR-NPL is the custodian of National Standards and maintains the Indian Standard Time (IST). It is mandated to be India's National Measurement Institute (NMI) by an act of Parliament. CSIR-NPL disseminates precision measurements that are needed for the growth of Indian science and industry as well as for the legal metrology needs of the nation. Over the years the laboratory has developed expertise in the subject enabling it to shift its basis for measurement standard from 'artifact' to quantum standards. The laboratory provides apex level calibration services in the country; offering National Accreditation Board for Testing and Calibration Laboratories (NABL), the national accreditation body in the country.

EOI are hereby invited through Central Public Procurement (CPP) Portal <https://epublishing.gov.in/eprocure> through **OFFLINE HARD COPY of offers** from manufacturers, their authorized distributors and Indian Agent of Foreign principals, if any, under the provision of various policy initiatives and notifications issued by various Ministries / Departments of the Govt. of India for purchase of items listed below:

Ref no. 14-VIII/MJ(8-OTE)2024PB

Procurement of "Laser Interferometer"

Last date of submission : 30th Jan, 2025 upto 3.00 PM

Date of opening : 31st Jan 2025 at 3.00 PM

Interested bidders may download the details form our website : www.nplindia.org or on (CPP) Portal (<https://epublishing.gov.in/eprocure>)


Sr. Controller of Stores and Purchase

Subject : Invitation for Expression of Interest (EOI) for the procurement of "Laser Interferometer"

CSIR-National Physical Laboratory, New Delhi has the responsibility of realizing the units of physical measurements based on the International System (SI units) under the subordinate legislations of weights & Measures Act 1956 (reissued in 1988 under the 1976 Act). NPL also has the statutory obligation to realize, establish, maintain, reproduce and update the national standards of measurement & calibration facilities for different parameters. CSIR-NPL is the custodian of National Standards and maintains the Indian Standard Time (IST). It is mandated to be India's National Measurement Institute (NMI) by an act of Parliament. CSIR-NPL disseminates precision measurements that are needed for the growth of Indian science and industry as well as for the legal metrology needs of the nation. Over the years the laboratory has developed expertise in the subject enabling it to shift its basis for measurement standard from 'artifact' to quantum standards. The laboratory provides apex level calibration services in the country; offering National Accreditation Board for Testing and Calibration Laboratories (NABL), the national accreditation body in the country.

Broad Objectives:-

Establishment of reference standard for length using laser interferometers

EOI are hereby invited from reputed engineering/fabricating companies/firms for putting up "Laser Interferometer". Firms having done similar nature of work can apply along with the documentary evidence for the work done in the past. The firms should also meet the other parameters as given below and are required to submit following information along with their applications.

- 1.) Name of the firm with their constitution/proprietorship/partnership details etc., with the date of establishment/registration.
- 2.) List of similar orders successfully completed in the last three years as above with testimonials from department concerned and the details of contact persons.
- 3.) The firm should not have incurred any loss in more than two years during the last five years ending 31st March 2024.
- 4.) List of works in hand giving nature of work, department, cost, date of start and completion with present progress and the contact details of clients.
- 5.) Balance sheet of the firm for previous two years (2022-2023 and 2023-2024) must be enclosed with the offer certified by chartered accountant evidencing turnover.
- 6.) The article of association in order to know the standing of the firm.

Unpriced Offers against this EOI should be submitted to "The Director, CSIR-NPL, Dr. K.S. Krishnan Marg, New Delhi-110012, Main building, Room No. 160, Purchase Branch as per the requirement. Last date of submission of EOI is 30th January 2025 upto 3.00 PM. Shortlisted firms shall be called for making a presentation at a later date.

If any information furnished by the applicant is found incorrect at a later stage, it shall be liable to be debarred from tendering/taking up of work in CSIR. CSIR-NPL reserves the right to verify the particulars furnished by the applicant; independently. CSIR-NPL reserves the right to reject any prospective application without assigning any reason.

A Stabilized He-Ne (633nm) <u>Laser interferometer</u> with linear displacement measurement kit		
1.1.1	Output wavelength	633 nm (He-Ne Laser Interferometer)
1.1.2	Power	< 1 mW (class II)
1.1.3	Beam Diameter	6mm (A switchable aperture for smaller diameter ≤ 3 mm)
1.1.4	Beam Quality	TEM00 mode
1.1.5	Vacuum wavelength Accuracy	Short term: ± 0.005 ppm or better Long term ± 0.05 ppm or better
1.1.6	Linear Measurement Accuracy	± 0.5 ppm or better with environmental compensation at Room temp.
1.1.7	Range	Distance: 0-30 m or more Maximum travel velocity: 3 m/s or above Axial Range: 0-10 Meter
1.1.8	Power Supply	as per Indian standard
1.1.9	Laser Warm up /Pre heat time	30 min or less
1.1.10	Laser Operating temperature	0 -40°C
1.1.11	Humidity	10-90 % RH Non condensing
1.1.12	Measurement display	Digital
1.1.13	Laptop	Compatible Laptop with minimum configuration Processor i3 or better, RAM 8GB, SSD256GB screen 14" or above, Windows 11 pro (licensed English), MS Office. With additional LCD monitor 18.5" or above
1.1.14	Printer	A4 both side Printer
1.1.15	Software Capabilities	Laser interferometer software with following built in latest measurement analysis standards module listed below: Modules for linear, angular, flatness, straightness and squareness measurement Dynamic measurement capability with selectable data collection rates. Standard report option e.g. ISO 230-2 2014, ASME B5.542005, VDI 3441, JIS B6192 1999, JIS B 6190-2 2008 and GB 17421.2 etc Provision for generating of compensation values should be included
1.1.16	Compensation unit (automatic)	A complete Environmental Compensation Unit for environment parameter interface and software with interface and cables Edlen equation 92 and above, Suppliers should mention the equation for the environmental conditions.
1.1.17	Automatic Compensation time	Auto sensing ≤ 10 sec.
1.1.18	Air Temperature	Range: 0-40°C Accuracy: ± 0.2 °C Resolution: 0.02°C
1.1.19	Humidity	Range: 10-90% RH Accuracy: ± 10 % Resolution: 1 %
1.1.20	Air pressure	Range: 800- 1300 Pa / 600-1000 mbar Accuracy: ± 200 Pa (± 2 mbar) Resolution: 5 Pa
1.1.21	Material temperature	Range: 0-50 0C Accuracy: ± 0.2 °C

		Resolution: 0.02 ^o C	
1.1.22	Connectors, cables & interfaces	This compensation unit and sensors should have all cables (> 10 meter) , connectors and interfaces	
1.1.23	Optics	Complete optics for Linear displacement measurement comprising of interferometer and retro reflectors.	
1.1.24	Optics cleaning kit	One set of Optics cleaning kit comprising of forceps, cleaning tissue for optics and Hand blower.	
1.1.25	Post and Mounts	Post and mounts of different height (6 mm dia.) compatible, Magnetic mounts, post 4 inch (100mm length) and 8 inch (200 mm length) base. Base both Large and small, Height adjusters etc. (all mounts, base and other accessories required for laser interferometer for linear measurement)	
1.1.26	Electronics	All other necessary electronics, cable, cards for laser interferometer for running the laser system, and environmental compensation unit.	
1.1.27	Documentation	Documents related to laser systems, Operational manuals and troubleshooting to be provided with the system	
1.1.28	Certification	All laser interferometer must have : (a) Calibration of stabilized laser source wavelength (b) Verification of displacement measurement up to 30 meters (c) Calibration of Compensation unit (environment and material) as mentioned in 1.1.17 (d) Calibration of material sensors as mentioned in 1.1.21 All Calibration certificates (a-d) from signatory of BIPM-MRA NMI only	
1.2	Mechanical Bed for laser interferometer		
1.2.0	A High Precision Granite Mechanical Bed with motorized carriage to place the laser interferometer		
1.2.1	Heavy Granite base structure 2500mm x 750mm x 250mm (Thickness) mounted on heavy duty fabricated powder coated steel stand.		
1.2.2	Precision carriage of length 1000mm guided movement with precision LM guides or air bearings. Carriage should have facility for mounting different line scales used in legal metrology application during its calibration. The moving carriage should have facility for precision alignment of line scale to the measuring axis of the calibration system.		
1.2.3	Motorized servo positioning drive system for precision positioning of precision carriage with fine adjustment. Joystick Control for motorized carriage movement.		06
1.2.4	Drag chain arrangement for cable(s) to ensure smooth and free force movements of carriage.		
1.2.5	Provision to mount digital camera rigidly on the bed so that camera focal plane should be adjusted on top of the moving carriage on which line scale will be mounted during its calibration.		
1.2.6	Provision to mount laser interferometer and its optics to comply Abbe's principle.		
1.2.7	Holding stands for two 18.5" LCD monitors for easy alignment		
1.2.8	I 7 or better Desktop computer with two LCD monitors (18.5 ") with all in one laser printer (both side)		
1.2.9	A wooden office executive desk with three executive chairs		
1.2.10	Bidder to submit design drawing along with the bid.		
1.3	Microscopic high resolution digital camera & related accessories for laser interferometer		
1.3.1	CMOS/CCD digital camera, USB 3.0 camera with lens Magnification 10x to 100x Resolution 5MP or better, 100 frames per second or better		05
1.3.2	LED ring light with facility for adjusting illumination.		
1.3.3	Machine vision software		