

Global tender for the supply of  
Photonic integrated circuit active assembly, glueing and  
testing system  
to Indian Institute of Science Bangalore.  
GTE approval ref. F.No. 5 I -03/2023-TS.VII

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This is a Request for Quote (RFQ) from global vendors for the supply of Photonic integrated circuit active assembly, glueing and testing system.

## Section 1 - Bid Schedule

1	Tender No	CeNSE-SKS/2023/12/4
2	Tender Date	19 <sup>th</sup> Dec 2023
3	Item Description	Photonic integrated circuit active assembly, glueing and testing system
4	Tender Type	Two bid system (i) Technical Bid (Part A) (ii) Commercial Bid (Part B)
5	Place of tender submission	Chairperson Office, First Floor, Centre for Nano Science and Engineering Indian Institute of Science, Bangalore 560012
6	Last Date & Time for submission of tender	Exteded deadline: 12 <sup>th</sup> Jan 2024, 5 PM IST. Old dedeline: 9 <sup>th</sup> Jan 2024, 5 PM IST.
7	For further clarification	Prof. Shankar Kumar Selvaraja CeNSE, Indian Institute of Science Bangalore – 560012, India. <a href="mailto:shankarks@iisc.ac.in">shankarks@iisc.ac.in</a>

# Section 2 – Eligibility Criteria

Prequalification criteria:

1. The Bidder's firm should have existed for at least 5 years. Bidders should enclose the Company Registration Certificate.
2. Quote should come only from Original Equipment Manufacturer (OEM) or their authorized distributor.
3. The quotations should be CIP-Bangalore Airport.
4. The bidder should sign and submit the declaration for Acceptance of Terms and Conditions as per -Annexure 4.
5. The Bidder must not be blacklisted/banned/suspended or have a record of any service- related dispute with any organization in India or elsewhere. A declaration to this effect has to be given as per Annexure 3.

## Section 3 – Terms and Conditions

### A) Submission of Tender:

1. All documentation in the tender should be in English.
2. Tenders should be submitted in two envelopes (a two-bid system).
  - a. Technical Bid (Part-A) – Technical bid consisting of all technical details and checklist for conformance to technical specifications.

The technical proposal should contain a technical compliance table with five columns.

- I. The first column must list the technical requirements in the order given in the technical requirement below.
  - II. The second column should provide instrument specifications against the requirement. Please provide quantitative responses wherever possible.
  - III. The third column should describe your compliance with a "Yes" or "No" only. Ensure that the entries in column 2 and column 3 are consistent.
  - IV. The fourth column should state the reasons/explanations/context for deviations, if any.
  - V. The fifth column can contain additional remarks from the OEM. You can use this opportunity to highlight technical features, qualify responses of previous columns, provide additional details, compare your solution with your competitors, or provide details as requested in the technical requirements table below.
- b. Commercial Bid (Part-B) – Indicating item-wise price for the items mentioned in the technical bid, **as per the format of quotation provided in the tender** and other commercial terms and conditions.
3. The technical bid and price bid should be placed in **separate sealed covers**, superscribing the tender description, tender no., and the due date on both envelopes. Both these sealed covers are to be placed in a bigger cover which should also be sealed and duly superscripted with the Tender No, Tender Description & Due Date.
  4. The SEALED COVER should reach the Chairperson Office, Department of Electronic Systems Engineering, Indian Institute of Science, Bangalore – 560012, India, on or before the due date mentioned in the tender notice. If

the due date is a holiday, the tender will be accepted on the next working day. If the quotation cover is not sealed, it will be rejected.

5. All queries are to be addressed to the person identified in "Section 1 – Bid Schedule" of the tender notice.
6. GST/other taxes, levies, etc., should be indicated separately. The BIDDER should mention GST Registration and PAN in the tender document.
7. If the price is not quoted in the Commercial Bid as per the format provided in the tender document, the bid is liable to be rejected.
8. The purchase committee reserves the right to accept or reject any bid and annul the bidding process and reject all bids at any time prior to the award of the contract without thereby incurring any liability to the affected bidder or bidders or any obligation to inform the affected
9. bidder or bidders.
10. Incomplete bids will be summarily rejected.

**B) Cancellation of Tender:**

Notwithstanding anything specified in this tender document, the IISc purchase committee, in its sole discretion, unconditionally and without having to assign any reason, reserves the rights:

- a. To accept OR reject the lowest tender, any other tender, or all the tenders.
- b. To accept any tender in whole or in part.
- c. To reject the tender, offer not confirming the tender terms.

**C) Validity of the Offer:**

The offer shall be valid 30 Days from the commercial bid's opening date.

**D) Evaluation of Offer:**

1. The technical bid (Part A) will be opened first and evaluated.
2. Bidders meeting the required eligibility criteria in Section 2 of this document shall only be considered for Commercial Bid (Part B) opening. Further, agencies not furnishing the documentary evidence as required will not be considered.
3. Prequalification of the bidders shall not imply final acceptance of the

Commercial Bid. The agency may be rejected at any point during technical evaluation or commercial evaluation. The decision regarding acceptance and/or rejection of any offer in part or full shall be the sole discretion of IISc Bangalore, and the decision in this regard shall be binding on the bidders.

4. The contract award will be subject to acceptance of the terms and conditions stated in this tender.
5. Any offer which deviates from the vital conditions (as illustrated below) of the tender is liable to be rejected:
  - a. Non-submission of complete offers.
  - b. Receipt of bids after the due date and time or by email/fax (unless specified otherwise).
  - c. Receipt of bids in open conditions.
6. In case any BIDDER is silent on any clauses mentioned in these tender documents, IISc Bangalore shall construe that the BIDDER has accepted the clauses as of the tender, and no further claim will be entertained.
7. No revision of the terms and conditions quoted in the offer will be entertained after the last date and time fixed for receipt of tenders.
8. The lowest bid will be calculated based on the total price of all items tendered for the basic equipment, accessories selected for installation, operation, preprocessing and post-processing, optional items, recommended spares, warranty, and annual maintenance contract. The purchase committee seeks the most cost-effective solution for obtaining a new tool. Vendors are encouraged to propose all avenues, including but not limited to buy back of the existing tool, turnkey upgrade of existing to, I or purchase of a new tool.

E) Pre-requisites:

The bidder will provide the pre-requisite installation requirement of the equipment along with the technical bid.

F) **Warranty:**

The complete system has to be under warranty for a **minimum period of 3 years** (year-wise breakup value should be shown in the commercial bid). The vendor should include the cost of any spares needed during the warranty period, including electronics, subcomponents, and software. If the instrument is defective, it has to be replaced or rectified at the bidder's cost within 30 days from receipt of written communications from IISc, Bangalore. If there is any delay in replacement or rectification, the warranty period should be extended.

G) **Annual Maintenance Contract:**

An annual maintenance contract for at least three years post-warranty should be provided as an essential, optional item upon completion of the warranty period.

H) **SPARES:**

Vendors must provide a detailed list of spares and a user manual with a detailed Bill of Materials for all Parts. It should include the Spares Column with the Manufacturer part Number, Qty, and availability of stock after 3 Years.

I) **Purchase Order:**

The quantity of the items in the tender is only indicative. IISc, Bangalore reserves the right to increase /decrease the quantity of the items depending on the requirement.

If the product and service quality is unsatisfactory, IISc, Bangalore reserves the right to cancel or amend the contract.

J) **Delivery, Installation, and Training:**

The bidder shall provide the lead time to delivery, installation, and made functional at IISc, Bangalore, from the date of receipt of the purchase order. The system should be delivered, installed, and functional within 120 days of receipt of the purchase order. The supply of the items will be considered as effected only on satisfactory installation and inspection of the system and the inspection of all the items and features/capabilities tested by the IISc, Bangalore. **For acceptance, the vendor must demonstrate the technical specifications mentioned in the tender.** After successful installation and inspection, the date of taking over the entire system by the IISc, Bangalore, shall be taken as the start of the warranty period. **No partial shipment is allowed.**

The bidder should also arrange for technical training for the local facility technologists

and users.

**K) Payment Terms:**

Full payment (except AMC) will be released after completion delivery, satisfactory installation, and qualification, subject to TDS as per rules. As per GFR, no advance payment can be made to domestic vendors unless an equal amount of bank guarantee is provided.

**L) Statutory Variation:**

Any statutory increase in the taxes and duties subsequent to the bidder's offer, if it takes place within the original contractual delivery date, will be borne by IISc, Bangalore, subject to the claim supported by documentary evidence. However, if any decrease occurs, the advantage will have to be passed on to IISc, Bangalore.

**M) Disputes and Jurisdiction:**

Any legal disputes arising from any breach of contract pertaining to this tender shall be settled in the court of competent jurisdiction in Bangalore, India.

**N) General:**

1. All amendments, time extensions, clarifications, etc., within the tender's submission period, will be communicated electronically. No extension of the bid due date/time shall be considered due to a delay in receipt of any document(s) by mail.
2. The bidder may furnish any additional information necessary to establish capabilities to complete the envisaged work successfully. It is, however, advised not to furnish superfluous information.
3. With prior intimation, the bidder may visit the installation site before tender submission.
4. Any information furnished by the bidder found to be incorrect, immediately or later, would render the bidder liable to be debarred from tendering/taking up work in IISc, Bangalore.



# Section 4 – Technical Specifications

The specifications have to be demonstrated during system installation and acceptance.

## Photonic integrated circuit active alignment assembly, glueing and testing system.

<b>Alignment systems</b>	2 (left, right)
<b>Alignment axes</b>	6 (x, y, z, $\theta_x$ , $\theta_y$ , $\theta_z$ )
<b>Alignment control</b>	motorised (all axes)
<b>Alignment system rotation centre</b>	tip of the gripper
<b>Linear travel range</b>	X=170 mm, Y=80 mm, Z=170 mm (X, Y= inplane, Z=vertical) (comment on scalability for handling 200 mm wafer)
<b>Linear travel resolution</b>	20 nm
<b>Bidirectional repeatability</b>	<0.1 $\mu\text{m}$
<b>Speed</b>	200 nm/sec (max)
<b>Rotation range</b>	$\theta_x, \theta_y$ (Pitch/Yaw)= $> \pm 10^\circ$ , $\theta_z$ (Roll)= $360^\circ$
<b>Rotation resolution</b>	0.001 $^\circ$
<b>Speed</b>	0.1 $^\circ$ /sec (max)
<b>Bidirectional repeatability</b>	0.005 $^\circ$
<b>Sample/wafer chuck</b>	Ability to rotate the stage
	Handle 150 mm wafer (scalable to 200 mm; please give options)
	Wafer holding using a vacuum
	Ability to control substrate temperature -20-100 $^\circ\text{C}$
	Option for horizontal and vertical translation motion of the wafer stage.
	Adapter chuck for assembly
<b>Pick-up</b>	Pick up station to accommodate Gelpack
<b>Height sensor</b>	Ability to map height between sample/wafer and fibre for testing.
<b>Height sensor resolution</b>	<100 nm
<b>Vertical mount vision system</b>	
<b>Camera motion system</b>	X=200 mm , Y= 100 mm, Z= 200 mm
<b>Movement resolution</b>	1 $\mu\text{m}$
<b>Repeatability</b>	$\pm 2 \mu\text{m}$
<b>Speed</b>	> 20 mm/sec
<b>Camera</b>	Suitable machine vision camera model

<b>Camera type</b>	Specify B/W or RGB
<b>Machine vision software</b>	Integrated software to image and move the camera assembly
<b>Image processing</b>	Ability to perform autofocus, pattern recognition, edge identification, and colour control. Please specify other functionalities, if any. The control software should be able to perform screen grab and store the images.
<b>Zoom</b>	Ability to perform motorised zoom
<b>Magnification</b>	>10X
<b>Illumination</b>	coaxial/ring. Please specify. Ability to control intensity either manually or through control software.
<b>Additional camera</b>	Propose additional camera if required with justification.
<b>Gripper</b>	Design and number of grippers for fibre array, lens, and single fibre ferrule should be provided.
	Ability to perform double-ended fibre assembly should be possible with the two alignment systems (left and right)
	The gripper should be able to pick up fibre array, lenses, etc from a pick-up station.
	Any other grip options should be provided as an option.
<b>Alignment</b>	
	Active fibre or fibre array to PIC alignment for testing.
	Active fibre assembly to photonic IC for glueing and attachment.
	Details of the alignment algorithm used and the scope for custom alignment routines should be specified.
	Ability to make electro-optic measurement.
	Ability to make automated measurement across a 150 mm wafer.
	Ability to feed optical IO and electrical IO for automatic testing.
	Option to perform imaging using vertical IR camera for grating coupler.
	Option to perform horizontal imaging of output light from at least one end of the chip.
<b>Active alignment</b>	Lasere diode driver and TEC. Provide driver specifications.
	Photodetector current amplifier. Provide specifications.
	Optical power meter (400-1700 nm). Provide driver specifications.
	Optical power range 1 $\mu$ W to 150 mW.
<b>Optical and electrical probes</b>	Grippers to accommodate optical fibres/fibre array for measurement
	Ability to perform DC and RF measurements

	Manual probes holders and positioners. Placement plates.
<b>Glue dispense</b>	Automatic control of glue resin. Provide specifications of minimum volume, lifetime, etc.
<b>UV curing</b>	UV LED for curing is to be provided. Desirable to have the illumination automated.
<b>Laser Welding</b>	Ability to perform laser weld ferrules.
	The welding system should be integrated with the assembly unit.
	Provide details of the laser specification for the welding process.
<b>Software</b>	The system should be controllable through a single software interface.
	The software should have a user-friendly user interface.
	The software should work on the standard operating system, preferably Windows 11.
	The software should be supported for a lifetime with necessary, timely upgrades if required.
	The system may be controlled using a custom program.
<b>Electrical</b>	220-240 V/50 Hz
	Please specify the electrical load of the system at peak operation.
<b>Utility requirement</b>	Please specify special gas and utility requirements such as CDA, N2, Chilled water, etc.
<b>Enclouse</b>	It is desirable that the system is in an enclosure.
<b>Overall system requirement</b>	The system should be built on a stable platform for vibration isolation.
	Provide details of the platform.
	Provide location requirements and clean space requirements.
<b>Process acceptance</b>	Provide standard process acceptance tests at the factory and at the site.
	Demonstration of single fibre attachment input and output with grating or edge coupling
	Demonstration of one fibre array attachment to PIC with grating coupler
	Demonstration of automatic measurement.

<b>Demo</b>	The vendor is expected to run a demo of fibre array attachment to a photonic IC. Details to be mutually agreed.
<b>Accessories</b>	Vendors are encouraged to add components or accessories that may improve the performance of the system.
<b>Warranty</b>	3 years
<b>Training</b>	Training should be part of the installation and acceptance. Please specify if there are on-site training options at the vendor site.

Vendors are encouraged to quote optional items that may improve the performance and functionality of the system. Vendors are requested to quote alignment and glueing system, testing system and welding systems as separate commercial units. This will allow the committee to assess the financial implications. Furthermore, vendors are requested to comment on on-site upgrades of testing and welding system options from the basic alignment and glueing system.

## Section 5- Technical Bid

The technical bid should furnish all requirements of the tender along with all annexures in this section and be submitted to:

The Chairperson,  
Attn: Prof. Shankar Kumar Selvaraja  
First floor, Centre for Nano Science and Engineering,  
Indian Institute of Science,  
CV Raman Ave. Bangalore – 560012, India.

# Annexures

## Annexure 1:

### Details of the Bidder

The bidder must provide the following mandatory information & attach supporting documents wherever mentioned:

### Details of the Bidder

Sl. No	Items	Details
1.	Name of the Bidder	
2.	Nature of Bidder (Attach an attested copy of the Certificate of Incorporation/ Partnership Deed)	
3.	Registration No/Trade License (attach attested copy)	
4.	Registered Office Address	
5.	Address for communication	
6.	Contact Person: Name and Designation	
7.	Telephone No	
8.	Email ID	
9.	Website	
10.	PAN No. (attach copy)	
11.	GST No. (attach copy)	

Signature of the Bidder

Name  
Designation, Seal

Date:

## Annexure 2:

Declaration regarding experience

To,

The Chairperson,  
Attn: Prof. Shankar Kumar Selvaraja  
Centre for Nano Science and Engineering,  
Indian Institute of Science,  
CV Raman Ave. Bangalore – 560012, India.

Ref: Tender No: XXXXXXXXX Dated: XXXXX

Dear Sir/Madam

I have carefully reviewed the Terms & Conditions in the above-referred tender. I hereby declare that my company/firm has      years of experience in supplying and installing the proposed equipment.

(Signature of the Bidder)

Printed Name

Designation,

Seal

Date:

## Annexure 3:

Declaration regarding track record To,

The Chairperson,  
Attn: Prof. Shankar Kumar Selvaraja  
Centre for Nano Science and Engineering,  
Indian Institute of Science,  
CV Raman Ave. Bangalore – 560012, India.

Ref: Tender No: XXXXXXXX

Dated: XXXXX

Dear Sir/Madam,

I have carefully reviewed the Terms & Conditions in the above-referred tender. I hereby declare that my company/ firm is not currently debarred/blacklisted by any Government / Semi-Government organizations/institutions in India or abroad. I further certify that I am a competent officer in my company/firm to make this declaration.

Or

I declare the following

Sl.No	Country in which the company is Debarred /blacklisted / case is Pending	Blacklisted/debarred by Government / Semi-Government/Organization s /Institutions	Reason	Since when and for how long
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(NOTE: In case the company/firm was blacklisted previously, please provide the details regarding the period for which the company/firm was blacklisted and the reason/s for the same).

Yours faithfully (Signature of the Bidder)

Name  
Designation,  
Seal

Date:



## Annexure 4:

Declaration for acceptance of terms and conditions

To,

The Chairperson,  
Attn: Prof. Shankar Kumar Selvaraja  
Centre for Nano Science and Engineering,  
Indian Institute of Science,  
CV Raman Ave. Bangalore – 560012, India.

Ref: Tender No: XXXXXX

Dated: XXXX

Dear Sir/Madam,

I have carefully reviewed the Terms & Conditions mentioned in the above-referred tender document. I declare that all the provisions of this tender document are acceptable to my company. I further certify that I am an authorized signatory of my company and am, therefore, competent to make this declaration.

Yours faithfully,

(Signature of the  
Bidder) Name  
Designation, Seal

Date:

## Annexure 5:

### Details of items quoted:

- a. Company Name
- b. Product Name
- c. Part/Catalogue number
- d. Product description/main features
- e. Detailed technical specifications
- f. Remarks

### Instructions to bidders:

1. Bidder should provide technical specifications of the quoted product/s in detail.
2. Bidder should attach product brochures along with the technical bid.
3. Bidders should clearly indicate compliance or non-compliance with the technical specifications provided in the tender document.

# Section 6 – Commercial Bid

The commercial bid should be furnished with all requirements of the tender with supporting documents as mentioned:

Addressed to

The Chairperson,  
Attn: Prof. Shankar Kumar Selvaraja  
Centre for Nano Science and Engineering,  
Indian Institute of Science,  
CV Raman Ave. Bangalore – 560012, India.

S.No	Description	Cat. Number	Quantity	Unit Price	Sub Total
1.	Essential items noted in the technical specification				
1.a	... (details of essential items)				
1.b	...				
2.	Optional items noted in the technical specification				
2.a	... (details of essential items)				
2.b	...				
3.	Accessories for operation and installation				
4.	All consumables, spares and software to be supplied locally				
5.	Warranty (3 years)				
6.	AMC 3 years beyond warranty				
7.	CIP/CIF IISc, Bengaluru				
8.					

Any additional items, such as Spares and Hardware/PCBs Likely to go obsolete after the next 3 Years

S.No	Description	Cat. Number	Quantity	Unit Price	Sub total

# Section 7 – Checklist

(This should be enclosed with a technical bid- Part A)

The following items must be checked before the Bid is submitted:

## 1. Sealed Envelope "A": Technical Bid

1. **Section 5- Technical Bid (each page signed by the authorized signatory and sealed) with the below annexures:**
  - a. **Annexure 1: Bidders details**
  - b. **Annexure 2: Declaration regarding experience**
  - c. **Annexure 3: Declaration regarding clean track record**
  - d. **Annexure 4: Declaration for acceptance of terms and conditions**
  - e. **Annexure 5: Details of items quoted**
2. **Copy of this tender document duly signed by the authorized signatory on every page and sealed.**

## 2. Sealed Envelope "B": Commercial Bid

### **Section 6: Commercial Bid**

Your quotation must be submitted in two envelopes: **Technical Bid (Envelope A) and Commercial Bid (Envelope B)**, superscribing on both the envelopes with, Tender description, Tender No. and due date and both of these in sealed covers and put in a bigger cover which should also be sealed and duly super scribed with Tender No., Tender description & Due Date.