

17th May 2024

To Whom It May Concern

Global Tender for a Mask Aligner System

This is an RFQ (Request for Quote) for procurement of a Mask Aligner system as part of a Global tender for the Centre for Nano Science and Engineering (CeNSE) at IISc, Bangalore.

CeNSE is a multidisciplinary research department at IISc that houses a 14,000 sq. ft. cleanroom and characterization facility used by 50 faculty members from various disciplines at IISc. CeNSE also runs a program called Indian Nanoelectronics Users Program (INUP) which has allowed 4200 participants from more than 700 universities and institutes all over India to use the facilities at CeNSE. Consequently, any tool in CeNSE receives significant exposure to scientific community at IISc and beyond. The vendors are requested to factor in the value of this exposure in to their quotes. Details of existing facilities and INUP program can be gleaned from:

<http://nnfc.cense.iisc.ac.in/>
<http://www.mncf.cense.iisc.ac.in/>
<https://www.inup.cense.iisc.ac.in/>

Also, CeNSE hosts equipment on behalf of vendors, as a national standard or 'model' system. If the vendor is interested, CeNSE can consider working out a similar arrangement for the ICP-RIE system.

Procedure

1. Vendors will be required to submit a technical proposal and a commercial proposal in **two separate sealed envelopes**. Only vendors who meet the technical requirement will be considered for the commercial negotiation.
2. **The deadline for submission of proposals is the 7th of June 2024, 5:30 pm Indian Standard Time.** Proposals should arrive at the Main office, GF-15, Centre for Nano Science and Engineering, Indian Institute of Science, Bangalore 560012, India, by the above deadline.
3. The decision of purchase committee will be final.
4. The technical proposal should contain a compliance table with 5 columns. The first column must list the technical requirements, in the order that they are given in the technical configuration below. The second column should describe your compliance in a "Yes" or "No" response. If "No" the third column should provide the extent of the deviation (please provide quantitative responses). The fourth column should state the reasons for the deviation, if any. The fourth column can be used to compare your tool with that of your competitors or provide details as requested in the technical requirements table below.
5. Any additional capabilities or technical details, that you would like to bring to the attention of the purchase committee, can be listed at the end of the technical table.

6. Vendors are encouraged to highlight the advantages of their tools over comparable tools from the competitors
7. If multiple systems can fulfill the requirements, vendors can submit multiple bids.
8. In the commercial bid, please provide itemized cost of the system and *required* accessories, such as software, power supply, etc.
9. As an option, please provide itemized cost for any *suggested* accessories/add-ons that may enhance the usability, capability, accuracy or reliability of the tool. Vendors are encouraged to quote for as many add-ons as their tool portfolio permits.
10. The quotes should be CIF Bangalore, India. So please include cost of shipping.
11. Please indicate the warranty provided with the tool. Warrant of 3 years of more is preferred.
12. Provide itemized cost for *required* spares for 2 years of operation. For sake of this calculation, the vendor may assume active tool usage of 20 hours/ week. This number will be used to estimate the life cycle cost of the tool.
13. Clarify if periodic (preventive) maintenance be done by a trained on-site engineer or requires a specialist from the OEM.
14. If maintenance requires OEM, as an additional option, provide cost of an annual maintenance contract (AMC) for 3 years, post warranty. The AMC must cover 1 scheduled and 1 emergency visit per year. It must also indicate who will service the AMC, an Indian agent or the OEM. The AMC cost must also include an itemized list of spares that are essential for the scheduled visits.
15. The RFQ must include references of 3 previous installations, preferable in India. Please provide the names and contact addresses of the referees, so that the committee can contact them independently.
16. Any questions can be directed to Gajendra M, Centre for Nano Science and Engineering, Indian Institute of Science, Bangalore 560012, India. (gajendram@iisc.ac.in)

Technical Requirements

1.	Primary application	<ul style="list-style-type: none"> • Ability to do routine photolithography with semi-automatic alignment capability on substrates of arbitrary small pieces up to 4-inch wafer. • Ability to process mask sizes from 3" x 3" upto 5" x 5".
2.	System configuration	<ul style="list-style-type: none"> • System should be prepared for manual alignment stage with: Accurate contact wedge and thickness compensation unit. • System should have the alignment gap adjustable from 10 to 50 μm, top-side Alignment (TSA) accuracy should be $< 0.5 \mu\text{m}$ and backside accuracy should be $< 5 \mu\text{m}$. • Mechanical resolution of alignment stage X, Y axes of the system should be less than or equal to $0.1 \mu\text{m}$.

		<ul style="list-style-type: none"> • System should have capability for mask holder adaptation with vacuum holding designed for quartz, or glass masks. • Machine should be capable to handle mask size ranging from 3"x3" to 5"x5". • System should have the provision to handle standard mask and substrate thicknesses up to 4 mm and substrate size from 5 mm x 5 mm to 100 mm x 100 mm. • Mask holder must be provided with stop pins for pre alignment position. • Capable of handling gap, soft, hard and vacuum contact expose modes. Vendor should specify the distances for each mode. • System should have high precision manually adjustable top side alignment microscope for positioning the mask and substrate with minimum three objectives: preferably 5x, 10x and 20x. • Video system to display the microscope image on a screen.
3.	Lamp type and Optics	<ul style="list-style-type: none"> • LED with intensity non-uniformity <4% across 4" wafer, working on constant dose or constant intensity mode. • Multiple wavelength ranges along with optical filter of 365nm and 405nm. Also, the system optics should enables an easy switch between different wavelengths.
4.	Chuck	<ul style="list-style-type: none"> • The chuck should contain the guiding pins for precise loading/unloading of 2" and 4" wafer (for soft, hard and vacuum contact modes).
5.	Resolution	<p>System should perform, the line, space resolution as per the below specifications.</p> <ul style="list-style-type: none"> • Less than or equal to 1 μm line and space under hard contact. • Less than or equal to 2 μm line and space under soft contact. • Less than or equal to 3 μm line and space under proximity contact. • Less than or equal to 0.8 μm line and space under vacuum contact.

		Also, vendor should specify the achievable resolution process conditions (wafer size, resist type, temperature and humidity etc.,)
6.	Accessories	<ul style="list-style-type: none"> • Vendor should provide the Intensity meter (optometer) with necessary probe sensors 365 nm and 405 nm. • Dry Vacuum pump for sample and mask holding. • One Operator manual for cleanroom. • Anti-vibration table.
7.	Optional Accessories to be quoted separately	<ul style="list-style-type: none"> • System should have back side alignment system with 2" & 4" wafer. • Chucks for 2" and 1" wafer along with corresponding Mask Holder.
8.	Microscopes	<ul style="list-style-type: none"> • CCD camera for top and bottom, Top side: Magnification: 5x to 50x, Travel range: Please specify X and Y – travel ranges • Bottom side: Please specify X- and Y – travel ranges
9.	Footprint & weight	<ul style="list-style-type: none"> • The system should be compatible with better than class 100 cleanroom environment. Please specify the total foot print in cm x cm, and weight.
10	Process software	<ul style="list-style-type: none"> • Front panel displaying equipment and process status along with appropriate software to be supplied. • The software must allow varying levels of instrument access. A simplified basic access for a user to a full access to an engineer. • Interlock that can interface with the online reservation system, so that the tools can only be used by authorized users. • Complete logs of all the process and system parameters to be available and stored for future trouble shooting • Graphical representation of tool and process parameters • Provision to alert the user in case of emergencies and an option to integrate the alarm system to NNFC building monitoring software • Software need to be supported for the lifetime of the tool, if windows based, only latest version of windows will be accepted
11	Periodic Maintenance	<ul style="list-style-type: none"> • The system should require minimal maintenance. • Mention the recommended preventive maintenance schedule for the system. Any accessories needed for periodic preventive maintenance for 3 years , should be mentioned in separately the itemized quote. • Can the preventive maintenance be done by a trained on-site engineer or requires a specialist from the OEM? If the latter, please provide cost of a 3 year AMC with required kit/consumables.

		<ul style="list-style-type: none">The system should be supported by a trained local representative and should have a 48hour window of response
12	Installation and Training	<ul style="list-style-type: none">Installation and training at customer site, by the experts from principals should be part of the package.During the installation all the specifications of the processes should be verified for acceptance by the customer.If periodic maintenance can be done by the on-site engineer, please include the cost of training the engineer.
13	Power & utilities	<ul style="list-style-type: none">The instrument should work with Indian standardsMention the power requirement.Mention any utility requirement (water, air, exhaust, etc.)
14	Safety	<ul style="list-style-type: none">Mention any special safety requirement of the toolThe tool must come with a complement of interlocks to prevent common user errors.
15	Recommendation	<ul style="list-style-type: none">The system must submit references from atleast 3 previous installationsThe names and contact addresses of the referees must be submitted with the proposal, so the purchase committee can contact them independently.
16	Pre-purchase testing	<ul style="list-style-type: none">To ensure the equipment conforms for specifications, the committee requires the vendor to perform some standard tests <i>before</i> the purchase process is complete. The validity of the tender will hinge on the successful and accurate measurement of these test samples.The vendor must conclude the testing and submit the data within 1 week of receipt of samples.
17	Acceptance tests	<ul style="list-style-type: none">Patterning 1 um lines with spacing of 1 umAlignment of 2um lines with an accuracy of 1um

Thanking you,

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