



September 13th, 2022

To Whom It May Concern

Global Tender to supply a Direct Writer System.

This is an RFQ (Request for Quote) for procurement of a Direct Writer System 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 Direct Writer 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 4th Oct 2022, 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. Please indicate the warranty provided with the tool. A warranty of 3 years or more is preferred.
11. The quotations should be CIP – Bangalore Airport.
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. 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. 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, in a semiconductor fab of similar size or bigger, 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 **Dr. Savitha P**, GF-20, Centre for Nano Science and Engineering, Indian Institute of Science, Bangalore 560012, India. (savithap@iisc.ac.in).

Technical Requirements

1.	Primary application	<ul style="list-style-type: none"> • Semi-Automatic Direct Write System with an appropriate light source for patterning on photomasks and resist coated substrates. • Should be compatible with SEMI standards.
2.	Capabilities	<ul style="list-style-type: none"> • Critical dimension (CD) $\leq 600\text{nm}$, Lines and Spacing – (Dense patterns) • Line Edge roughness $\leq 75\text{nm}$ • Top side alignment accuracy $\leq 250\text{nm}$ • Back side alignment accuracy $\leq 1000\text{nm}$ (Optional) • 2nd layer accuracy $\leq 250\text{nm}$ • Straightness axis: $< 1\mu\text{m}$ over minimum 200mm.

		<ul style="list-style-type: none"> • Exposable area: $\leq 200\text{mm} \times 200\text{mm}$ • Writing speed @ 600nm resolution @ 256 greyscale level $\geq 300\text{mm}^2/\text{min}$ • Integrated camera system for auto alignment and substrate inspection • Manual, Semiautomatic, automatic modes (if applicable) • Minimum 256 levels of grayscale writing mode or higher
3.	Substrate details	<ul style="list-style-type: none"> • Support substrates from 5mmx5mm up to 8"x8" (for wafers). • Support substrates from 3"x3" up to 7"x7" (for soda lime photomasks). • Support substrates from 0 mm up 14 mm thickness or better
4.	Wavelength	<ul style="list-style-type: none"> • Must be between 350-405nm, with intensity control • Should be compatible with standard optical resists
5.	Stage	<ul style="list-style-type: none"> • Fully motorized stage with position control. • Stage Repeatability < 20 nm mean value within 200mm*200mm under stable environmental conditions with resolution of 2 nm or better. • Vacuum Chuck with minimum substrate size of 5mmx5mm, maximum of 8"x8" • Anti-vibration table to be provided
6.	Light source	<ul style="list-style-type: none"> • Highest resolution with long lifetime laser or LED
7.	Footprint & weight	<ul style="list-style-type: none"> • The system should be compatible with better than class 100 cleanroom environment. Please specify the total footprint in cm x cm, and weight.
8.	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 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 needs to be supported for the lifetime of the tool, if windows based, only latest version of windows will be accepted



9.	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 years AMC with required kit/consumables. The system should be supported completely and should have a 48-hour window of response
10.	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.
11.	Power & utilities	<ul style="list-style-type: none"> The instrument should work with Indian standards Mention the power requirement. Mention any utility requirement (water, air, exhaust, etc.)
12.	Safety	<ul style="list-style-type: none"> Mention any special safety requirement of the tool The tool must come with a complement of interlocks to prevent common user errors.
13.	Recommendation	<ul style="list-style-type: none"> The system must submit references from at least 3 previous installations in a semiconductor fab of similar size as National Nanofabrication Centre at IISc or bigger The names and contact addresses of the referees must be submitted with the proposal, so the purchase committee can contact them independently.
14.	Pre-purchase testing	<ul style="list-style-type: none"> To ensure the equipment conforms to specifications, the committee requires the vendor to perform some standard tests before 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 2-3 week after a request has been made for the same.
15.	Acceptance tests	<ul style="list-style-type: none"> Patterning 600nm lines and spacing on photomask and Silicon wafer Alignment of lines $\leq 1 \mu\text{m}$ with an accuracy of 250nm

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Thanking you,
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