

April 15th, 2024

To Whom It May Concern

GlobalTender for two Direct Writer Systems

This is an RFQ (Request for Quote) for procurement of two Direct Writer Systems 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 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 6th May 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 the 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. Warranty of 3 years or 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 Dr. Savitha P, GF-20, Centre for Nano Science and Engineering, Indian Institute of Science, Bangalore 560012, India. (savithap@iisc.ac.in)

Technical Requirements

		System 1	System 2
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 	<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.	Resolution	<ul style="list-style-type: none"> • CDs= 1 um, Lines and Spacing – 1.5um • Edge roughness <=150nm • CD uniformity of <=300nm across 150mmx150mm 	<ul style="list-style-type: none"> • CDs= 0.6 um, with optical autofocus • Lines and Spacing – <1um • Edge roughness <=50nm

		<ul style="list-style-type: none"> • Writing area of upto 150mmx150mm or better • Write Speed minimum 40mm²/minute or better 	<ul style="list-style-type: none"> • CD uniformity of <=50nm across 150mmx150mm • Writing area of upto 150mmx150mm or better • Write Speed minimum 10mm²/minute or better
3.	Substrate details	<ul style="list-style-type: none"> • Processing of substrates minimum 5mmx5mm to 6 inch wafers or better • Photo masks of 3"x3" to 7x7inch or better 	<ul style="list-style-type: none"> • Processing of substrates minimum 5mmx5mm to 6 inch wafers or better • Photo masks of 3"x3" to 7x7inch or better
4.	Wavelength	<ul style="list-style-type: none"> • Must be in range of 350-405nm, with intensity control • Should be compatible with standard optical resists, both positive and negative 	<ul style="list-style-type: none"> • Must be in range of 350-405nm, with intensity control • Should be compatible with standard optical resists, both positive and negative
5.	Stage	<ul style="list-style-type: none"> • Fully motorised stage with position control by interferometer, • Vacuum Chuck with minimum substrate size of 5mmx5mm, maximum of 7"x7" or better • Anti-vibration table to be provided • Substrate thickness of minimum 0.1um to 12mm • Interferometer Resolution of 20nm or better 	<ul style="list-style-type: none"> • Fully motorised stage with position control by interferometer, • Vacuum Chuck with minimum substrate size of 5mmx5mm, maximum of 7"x7" or better • Anti-vibration table to be provided • Substrate thickness of minimum 0.1um to 12mm • Interferometer Resolution of 10nm or better
6.	Alignment accuracy	<ul style="list-style-type: none"> • TSA / 2nd layer accuracy <=0.5um • Integrated camera system for auto alignment and substrate inspection • Manual, Semiautomatic, automatic modes 	<ul style="list-style-type: none"> • TSA / 2nd layer accuracy <=0.25um • Integrated camera system for auto alignment and substrate inspection Manual, Semiautomatic, automatic modes

7.	Light source	<ul style="list-style-type: none"> LED or Diode Laser, working with intensity mode preferred Autofocus 	<ul style="list-style-type: none"> LED or Diode Laser, working with intensity mode preferred Autofocus
8.	Grey Scale	<ul style="list-style-type: none"> Optional 	<ul style="list-style-type: none"> Exposure mode with 128 levels or higher
9.	Metrology	<ul style="list-style-type: none"> Optional 	<ul style="list-style-type: none"> Metrology for automatic measurement of line widths and edge roughness
10.	Conversion software	<ul style="list-style-type: none"> Conversion software for DXF, CIF, GDSII, and Gerber files 	<ul style="list-style-type: none"> Conversion software for DXF, CIF, GDSII, and Gerber files
11.	Acceptance tests	<ul style="list-style-type: none"> Patterning $\leq 1.5\mu\text{m}$ lines and spacing on photomask and Silicon, 4 inch wafer, 5"x5" mask 2nd layer top alignment of lines $\leq 1.0\mu\text{m}$ with an accuracy of 0.5μm 	<ul style="list-style-type: none"> Patterning $\leq 0.6\mu\text{m}$ lines and spacing on photomask and Silicon, , 4 inch wafer, 5"x5" mask 2nd layer top alignment of lines $\leq 1.0\mu\text{m}$ with an accuracy of 0.25μm

12.	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. Include if there any accessories. Appropriate table with suitable vibration isolation should be part of the quote.
13.	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

14	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. The system should be supported by a trained local representative and should have a 48hour window of response
15	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.
16	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.)
17	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.
18	Recommendation	<ul style="list-style-type: none"> The system must submit references from atleast 3 previous installations The names and contact addresses of the referees must be submitted with the proposal, so the purchase committee can contact them independently.
19	Prior Installation	<ul style="list-style-type: none"> The System of same configuration that will be quoted, should have atleast 3 prior installations done and qualified in a similar fab/cleanroom like that of NNFC
20	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.
21	Acceptance tests	<ul style="list-style-type: none"> Patterning $\leq 0.5\mu\text{m}$ lines and spacing on photomask and Silicon 2ng layer top alignment of lines $\leq 0.5\mu\text{m}$ with an accuracy of $0.3\mu\text{m}$

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Thanking you,

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