

Indian Institute of Technology Delhi

Nanoscale Research Facility (NRF)
Hauz Khas, New Delhi-110016 (INDIA)

NOTICE INVITING QUOTATION

Date: 26-03-2013

DUE DATE: 22-04-2013

NIQ Ref. No.: IITD/NRF/2012-13/EBL

General description: An **Electron-beam lithography (EBL) system** for imaging and nanopatterning applications. The system should be capable of directly writing/defining nanopatterns having feature-size down to ~10 nm on the surface of various substrate materials such as Si, GaAs, GaN, Glass and Sapphire.

TECHNICAL SPECIFICATIONS for the EBL System:

1. Electron Optics System	1.1 Thermal field emission (TFE) Schottky source 1.2 Electron beam energy selectable from 1 keV (or lower) to 30 keV (or higher) 1.3 Beam size ≤ 10 nm 1.4 Beam current stability: $\leq 1\%$ / 8 hours (at $22^{\circ}\text{C} \pm 1^{\circ}\text{C}$) 1.5 Detectors: High efficiency SE detectors 1.6 High resolution image capturing with magnifications up to 100k or higher with suitable SE/BE detectors
2. Stage and Chamber	2.1 100 mm x 100 mm or more travel range laser interferometer controlled stage for XY positioning. The XY positional accuracy of 1 nm or better is required. 2.2 Working distance variable between 5 mm to 35 mm. 2.3 Sample holder for small samples (a few mm in size) and large samples up to 75 mm square should be available. 2.4 CCD camera for sample holder viewing

	<p>2.5 Dry vacuum pump system for oil-free chamber vacuum of $\leq 10^{-6}$ mbar. The vacuum near the electron-gun must be $\leq 10^{-9}$ mbar.</p>
3. Control panel	<p>3.1 The system must have an electron optics control panel with integrated keyboard for imaging functions such as focus, magnification, brightness and stigmator.</p>
4. Lithography Specifications	<p>4.1 Minimum grating periodicity: ≤ 40 nm</p> <p>4.2 Minimum feature size: ≤ 10 nm</p> <p>4.3 Field stitching: (3 sigma) ≤ 40 nm</p> <p>4.4 Overlay accuracy, alignment: (3 sigma) ≤ 40 nm</p> <p>4.5 Drift ≤ 100 nm per hour in open loop</p> <p>4.6 User defined write fields up to 1 mm with capability of defining floating fields</p> <p>4.7 Scan speed of 20 MHz or higher</p>
5. Software	<p>5.1 System control software with multi-user Interface</p> <p>5.2 SEM inspection and image archiving</p> <p>5.3 Patterning modes: line by line, circular, raster, free angle, parallel axis, parallel element, sub-modes: e.g. inwards, outwards, transversal, longitudinal</p> <p>5.4 Integrated proximity effect correction, postprocessor, resist development simulator and 3D graphic display, Monte Carlo simulation based parameter determination</p> <p>5.5 The data conversion software should be able to handle the input data files of various formats such as <i>dxf</i>, <i>gds2</i> and other standard formats.</p> <p>5.6 High speed PC with Windows XP (or higher) software environment including LCD or LED monitors</p>

<p>6. Loadlock</p>	<p>6.1 System should include a manual loadlock with high vacuum gate valve with oil-free pumping and safety interlocks</p> <p>6.2 It should be possible to transfer samples of size 75 mm x 75 mm or more using the loadlock system.</p>
<p>6. Nano-Manipulators</p>	<p>Two nano-manipulators with following specifications must be provided:</p> <p>6.1 Three-axis nano-manipulator with XYZ motion of 20 mm x 20 mm x 10 mm travel range or higher</p> <p>6.2 X and Y resolution 3 nm (or better) and Z resolution 3 nm (or better)</p> <p>6.3 Includes vacuum feed through for electrical connections</p> <p>6.4 Manual control mode using key pads</p>
<p>7. Optional items</p>	<p>7.1 The vendor may quote for optional items available with the standard tool.</p>

TERMS and CONDITIONS:

1. The quotation, in sealed envelope marked as “Ref: **IITD/NRF/2012-13/EBL**” should reach the undersigned on or before **5 pm on 05-04-2013**.
2. The prices quoted should be **C.I.F., New Delhi airport**. Additionally the price for delivery of the system up to IIT Delhi at the place of installation must also be provided.
3. **Technical and financial bids** should be enclosed in separate sealed envelopes and clearly marked.
4. A technical compliance table as per the technical specifications of the system must be provided in the technical bid.
5. Institute reserves the right to accept/ reject all/ any quotation without assigning any reason thereof.
6. The delivery period should be clearly indicated in the quotation.
7. Submitted quotations should clearly mention the validity period, preferably for a minimum of **3 months**.
8. Incomplete and conditional submitted tenders would be summarily rejected.
9. The mode of payment should be clearly indicated. The preferred mode of payment is through irrevocable **LC** (letter of credit).
10. Necessary certificate should be enclosed by the vendor in case of proprietary nature of the quoted items.
11. In case the quotation is being submitted by authorized agent of the principal manufacturing company, the AUTHORISED SALES AGENCYSHIP certificate from the PRINCIPALS should be furnished along with the quotation. Quotations without this authorization certificate will be rejected.
12. The quotation should include comprehensive **warranty for at least 1 year. An annual maintenance contract (AMC) for additional four years should also be provided.**
13. Special discount/rebate wherever admissible keeping in view that items are being procured for educational purpose in respect of Public Institution of national importance may please be indicated.

14. A list of users in India where the system has been installed should be provided by the vendor.

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