

HighResolutionElectronBeamLithographySystem(EBL)

S.No	Items	Specifications
1.	General Specifications	<p>a) The systems should be capable of advanced nano-lithography and nano-engineering applications, including ultra-high-resolution imaging.</p> <p>b) Multi-Layer Lithography: The machine must execute multilayer lithography with overlay accuracy better than ± 40 nm.</p> <p>c) The machines should be able to make greyscale patterns over planar substrates (thickness ~ 4 mm). It must be possible to define resist structures coated over these substrates with desired slope and periodicity.</p>
2.	Chamber and Stage	<p>a) XY Travel: At least 200 mm or better travel in X and Y with 1 nm position accuracy at any working distance, SEM magnification and write-field size.</p> <p>b) The stage should be capable of handling an 8-inch substrate, but the writing area can be 4 inches.</p> <p>c) Closed-loop stage controlled with a laser interferometer, i.e., position correction feedback signal applied to dc-motor main drives for fine positioning with shift-piezo.</p> <p>d) Z Travel: 30 mm total travel in Z, i.e., the working distance at full interferometric control kinematic. Able to mount various samples through the front door and pull-out stage. Universal sample holder for small (pieces 1 cm in diameter or less) and large (4 inches in diameter or better) sample sizes.</p> <p>e) There should be the provision of theta rotation of the stage for angular exposure and imaging.</p> <p>f) CCD Camera and Dry vacuum pump system for oil-free chamber vacuum. Integrated 3-fold antivibration platform with both vertical and horizontal vibration isolation mechanisms.</p> <p>g) The system should be capable of writing stitch-free patterns. It should be capable of following curved paths (especially for the ring-gyro applications) at a constant speed under laser control with a beam feedback loop. The system must be capable of writing continuous strip-shaped periodic patterns (For large-area grating applications) over large distances with no stitching errors.</p> <p>h) Arrangements for grounding of wafers/ masks/ substrates must be provided on all holders to avoid charge build-up.</p> <p>i) Manual load-lock for samples up to 100x100 mm must be provided.</p>
3.	Electron Gun and Beam Optics System	<p>a) The system should have a robust electron optical column with Schottky field emitter, ZrO/W or equivalent material with a life of 5000 hrs or more.</p> <p>b) Beam current range: must be variable, 5 pA – 20 nA. Variation in beam current stability: $\leq 0.5\%$ per 8 hours. Variation in beam position stability: ≤ 300 nm per hour.</p> <p>c) Beam energy should be selectable within the range of 20 eV to 30 KeV, in steps of 10 eV or less. A fully digital electron optics column must be provided.</p> <p>d) Fast electro-static beam blanker, having a rise time of 30 ns or less. The write field size should be continuously variable and controlled directly from the computer with automated calibration and selection. The system must auto-compensate field errors like scaling, rotation, and orthogonally.</p> <p>e) The beam size should be 2 nm or lower at 20 KeV with a beam current of ~ 150 pA at ~ 3 mm working distance and 4 nm at 1 keV with a beam current of ~ 250 pA at ~ 3 mm working distance. Compound electromagnetic-electrostatic immersion lenses must be provided for the lowest beam aberration.</p>

		<p>f) Secondary Electron (SE) Detectors: The system must have Everhart Thornley SE Detector. with high efficiency in-lens SE Detector with energy selective in-lens.</p> <p>g) Backscattered Electron Detector: In-lens backscattered electron detector with energy filtering technology; Full software integration for imaging and metrology must be provided.</p> <p>h) Systems should be capable of imaging non-conducting specimens like photoresist etc., of producing highly resolved images of 5 nm or smaller features.</p> <p>i) The Electron gun should have an Ion getter pump for continuously maintaining an ultra-high vacuum (10^{-8} mbar or better) in the gun region secured by a pneumatic gun isolation valve. The base vacuum in the specimen chamber should be better than 10^{-6} mbar. Proper gauges must be provided as per the system requirement. All vacuum control should be through fully integrated automatic software control.</p>
4.	System Software	<p>a) The system software should be a multi-user management system.</p> <p>b) Integrated professional GDS-II editor with large file-handling Capabilities. Integrated proximity effect correction, post processor, resist development simulator and 3D graphic display, Monte Carlo simulation-based parameter determination. A secondary software license for offline PC data preparation must be provided.</p> <p>c) The system must be provided with a compatible latest version high-performance computer with a high-end state-of-the-art processor (3 GHz or higher) and the latest Windows/Linux based operating system, sufficient numbers of USB ports (Not less than 4) and RAM (not less than 64 GB), 1 TB SSD disk, 1 TB HDD, Two 30-inch Monitors, DVD RW, Mouse, Keyboard and joy-stick</p> <p>d) Software for generating 3D or grey-scale lithography data, i.e., for holograms and zone plates. It should be capable of Importing greyscale TIFF or BMP data files—secondary software license for offline data preparation.</p> <p>e) Three Lithography Offline Licenses must be provided.</p>
5.	Pattern Generator and further hardware	<p>a) 400 MHz or better Digital Signal Processor controlled high-speed pattern generation unit with dynamic scan corrections.</p> <p>b) Digital-analogue gain/shift/rotation and control with sub-nm resolution to be provided. The minimum dwell time must be 50 ns with an increment of 1 ns or less.</p> <p>c) Write-field size calibration for optical grating pitch control within sub-nanometer resolution.</p> <p>d) Faraday cup built into the top of sample holders and Pico Amperemeter for measuring beam current. Automated Height Sensing must be available.</p> <p>e) Trackball/Joystick for scanning and image operations.</p>
6.	Miscellaneous Specifications	<p>a) the system must have an Uninterrupted Power Supply (UPS) and a closed-loop water chiller. The UPS is to be fully integrated with the software to drive down the system in a controlled way in case of power failure/critical times.</p> <p>b) Anti-Vibration System: Integrated active vibration isolation for the chamber and column must be provided.</p> <p>c) Site Survey (EM noise, acoustic and floor vibration measurements on-site & computer analysis of the impact on system performance; supply check) must be done by the supplier before installation</p> <p>d) On-site system installation, qualification & training (5 days training or up to the user satisfaction).</p> <p>e) Electron beam lithography starter kit with sample to be provided.</p> <p>f) The system should have on-site further up-gradation possibilities.</p>

		<p>g) The vendor must include a list of at least two successful installations for such High-Resolution Electron Beam Lithography in India. Vendors must have a direct local office in India & have trained service persons for services support.</p> <p>h) The system should be insured, packaged and shipped by the manufacturer to handle all possible unforeseen situations arising during transportation.</p> <p>i) The system should be compatible and comply with class-100 cleanroom environment standards. The system should comply with the Indian standard for industrial electrical appliances.</p> <p>j) The offered system shall be a 'brand new' system, and in no cases shall it use any refurbished item in building the same—vendor to provide a certificate for this.</p> <p>k) The vendor must provide a detailed description of the measurement procedure of the above specification, notably 1.c, 1.d and 1.e.</p> <p>l) The vendor should specify the prerequisites for the installation visit well before installing the system.</p> <p>m) The cost of an annual maintenance contract and emergency technical support that may involve an engineer being on-site within a stipulated period should be quoted in the commercial bid and addressed in the technical bid. The availability of trained engineers in India for servicing the system will be preferred and should be described in the technical bid.</p> <p>n) On all systems, a set of essential tools required - a non-standard screw or spanner head required for routine tool maintenance should be provided for regular maintenance.</p> <p>o) Systems should be capable of online diagnostics remotely in case of problems.</p> <p>p) Three years on-site unconditional comprehensive warranty after successful installations. Annual maintenance charges for seven years after completion of three years warranty period must be included and specified in the quotation.</p>
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Note: All the manufacturers from India and the global market are invited.

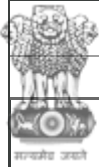
A meeting for Expression of Interest in hybrid mode is scheduled as per the details mentioned below:

Date : 22nd May, 2023 at 10.00 A.M. onwards in hybrid mode.

Venue: Room No. 1, Technology Block, CSIR-CSIO, Chandigarh

LINK

https://teams.microsoft.com/l/meetup-join/19%3ameeting_ZTE1Njc3MzltYjlmYi00M2QyLThhMWEtNTNIODMwNDQzMmNI%40thread.v2/0?context=%7b%22id%22%3a%22b867f20e-8a9c-4603-b5ab-39c3840dfb64%22%2c%22oid%22%3a%2237de66e9-924f-4eb7-ad1d-0c49a56d0492%22%7d



Basic Details

Organisation Chain	Council of Scientific and Industrial Research CSIO Chandigarh Purchase-CSIO-CSIR		
Tender Reference Number	CSIO/3(2)2023-Pur		
Tender ID	2023_CSIR_709762_1		
Tender Type	EOI	Form of contract	Supply
Tender Category	Goods	No. of Covers	2
Payment Mode	Not Applicable	Is Multi Currency Allowed For BOQ	No
Is Multi Currency Allowed For Fee	No		

Cover Details, No. Of Covers - 2

Cover No	Cover	Document Type	Description
1	Fee/PreQual/Technical	.pdf	Expression of Interest for procurement of Electron Beam Lithography tentative specification enclosed
		.xls	Expression of Interest for procurement of Electron Beam Lithography tentative specification enclosed
2	Finance	.xls	Expression of Interest for procurement of Electron Beam Lithography tentative specification enclosed

Tender Fee Details, [Total Fee in ₹ * - 0.00]

Tender Fee in ₹	0.00		
Fee Payable To	NA	Fee Payable At	NA
Tender Fee Exemption Allowed	NA		

EMD Fee Details

EMD Amount in ₹	0.00	EMD Exemption Allowed	NA
EMD Fee Type	NA	EMD Percentage	NA
EMD Payable To	NA	EMD Payable At	NA

Work /Item(s)

Title	Expression of Interest for procurement of EBL-3(2)2023				
Work Description	Expression of Interest for procurement of Electron Beam Lithography tentative specification enclosed				
Pre Qualification Details	Please refer Tender documents.				
Tender Value in ₹		Product Category	Laboratory and scientific equipment	Sub category	NA
Contract Type	Tender	Bid Validity(Days)	90	Period Of Work(Days)	45
Location	Purchase Section CSIR-CSIO Sector 30 Chandigarh	Pincode	160030	Pre Bid Meeting Place	Room No. 1 Technology Block CSIR-CSIO Chandigarh
Pre Bid Meeting Address	CSIR-CSIO Sector 30 Chandigarh For online meeting please see link in specifications	Pre Bid Meeting Date	22-May-2023 10:00 AM	Bid Opening Place	Purchase Section CSIR--CSIO Sector 30 Chandigarh

Critical Dates

Publish Date	03-May-2023 03:00 PM	Bid Opening Date	01-Jun-2023 03:30 PM
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Document Download / Sale Start Date	03-May-2023 03:00 PM	Document Download / Sale End Date	31-May-2023 03:00 PM
Clarification Start Date	03-May-2023 03:00 PM	Clarification End Date	18-May-2023 03:00 PM
Bid Submission Start Date	03-May-2023 03:00 PM	Bid Submission End Date	31-May-2023 03:00 PM

Tender Documents

NIT Document	S.No	Document Name	Description	Document Size (in KB)
	1	Tendernotice_1.pdf	Expression of Interest for procurement of Electron Beam Lithography tentative specification enclosed	309.84

Work Item Documents	S.No	Document Type	Document Name	Description	Document Size (in KB)
	1	Tender Documents	Specs322023.pdf	Expression of Interest for procurement of Electron Beam Lithography tentative specification enclosed	309.84

Tender Inviting Authority

Name	Controller of Stores and Purcahse
Address	The Director CSIR-CSIO Sector 30 Chandigarh

Tender Creator Details

Created By	Mohinder Kumar
Designation	COSP
Created Date	03-May-2023 02:30 PM