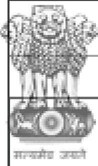

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Tender Details

Date : 26-May-2023 11:57 AM

Basic Details

Organisation Chain	Council of Scientific and Industrial Research||CSIO Chandigarh||Purchase-CSIO-CSIR		
Tender Reference Number	CSIO/3(3)2023-Pur		
Tender ID	2023_CSIR_712789_1		
Tender Type	EOI	**Form of contract**	Supply
Tender Category	Goods	**No. of Covers**	1
Payment Mode	Not Applicable	**Is Multi Currency Allowed For BOQ**	No
Is Multi Currency Allowed For Fee	No		

Cover Details, No. Of Covers - 1

Cover No	Cover	Document Type	Description
1	Fee/PreQual/Technical/Finance	.pdf	Expression of Interest for Inductively Coupled Plasma Reactive Ion Etching System detailed spec encl
		.xls	Expression of Interest for Inductively Coupled Plasma Reactive Ion Etching System detailed spec encl

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	CSIO/3(3)2023-Purt				
Work Description	Expression of Interest for Inductively Coupled Plasma Reactive Ion Etching System detailed spec encl				
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**	Online Link given in specificatrion
Pre Bid Meeting Address	CSIR-CSIO Sector 30 Chandigarh	**Pre Bid Meeting Date**	09-Jun-2023 02:00 PM	**Bid Opening Place**	Purchase Section CSIR--CSIO Sector 30 Chandigarh

Critical Dates

Publish Date	26-May-2023 12:30 PM	**Bid Opening Date**	14-Jun-2023 03:30 PM
Document Download / Sale Start Date	26-May-2023 12:30 PM	**Document Download / Sale End Date**	13-Jun-2023 03:00 PM
Clarification Start Date	26-May-2023 12:30 PM	**Clarification End Date**	12-Jun-2023 03:00 PM
Bid Submission Start Date	26-May-2023 12:30 PM	**Bid Submission End Date**	13-Jun-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 Inductively Coupled Plasma Reactive Ion Etching System detailed spec encl	469.94

Work Item Documents

S.No	Document Type	Document Name	Description	Document Size (in KB)
1	Tender Documents	ICP RIE Technical Specifications (1).pdf	Expression of Interest for Inductively Coupled Plasma Reactive Ion Etching System detailed spec encl	469.94

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	26-May-2023 11:53 AM

Inductively Coupled Plasma – Reactive Ion Etching (ICP-RIE) System

CSIR-CSIO, Chandigarh is looking for a stand-aloneinductively coupled plasma – reactive ion etching (ICP-RIE)system capable of carrying out the dry etching tasks for micro- and nano-fabrication ofphotonic crystals, quantum dot arrays, all kinds of gratings [DFB laser, DBR, chirped, coupling, phase-shifted], honeycomb structures, waveguides of all kinds (bended, coupled, arrayed, tapered, X-ray, plasmonic), Ring resonators, micro-ring filters, X-ray lenses, zone plates etc. The desired ICP-RIE system should meet thefollowingspecifications:

S.No.	Items	Technical Specifications
1.	**Substrate details**	a) The machine should be able to etchfine micro and nano-structures in a wide range of materials including silicon, silicon nitride, germanium, quartz, fused silica, BK7, SF15 glass etc. b) The desired ICP-RIE system should be able to handle the substrate of following sizes: 50 mm, 100 mm, and 200 mm diameter substrates. c) Substrate thickness: 2mm or more.
2.	**System requirement**	a) Aspect ratio and feature size: The system must be capable of etching the feature depth of at least 200 nm (or more) for a feature size of ≤ 100nm in aforementioned glass materials (aspect ratio of 2:1 or more). b) Roughness: The achievable roughness (Ra) on the etched surface should be ≤ 10 nm. c) Slope/Profile angle: The etched profile angle should be within 90±5°. d) Selectivity: The etching selectivity for the aforementioned substrate should be ≥10:1. e) Etch rate: The etch rate for glass (and other requested processes) should be≥200 nm/min. f) Uniformity: The uniformity of etched structures should be within±5%.
3.	**Process chamber**	a) The aluminium process chamber must be made from a full block of aluminium&there should not be any further sealing or welds inside the process chamber. b) The process chamber should be capable of electrical heating up to the temperature of 80°C or more. c) Manual load-lock for substrate up to 200 mmdiameter. d) Chamber shall have provision of a view port for viewing plasma.
5.	**Substrate electrode**	a) Substrate electrode diameter≥ 220 mm. b) The substrate electrode should be able to accommodate substratesup to 200mm or higher. c) It should be equipped with helium heat transfer with mechanical clamping (mechanical clamp & clamp ring). d) The helium cooling should be back pressure controlled; one should be able to set it as a process parameter. The flow shall be automatically measured via a MFC and displayed on the PC.
6.	**Electrode cooling**	a) Temperature range: -30°C to +150°C b) The full range of temperature control shall be automatically controlled from the recipe without user intervention between the cooling and heating ranges. c) Top part of the electrode must be of aluminium with temperature control by circulating a dielectric fluidthrough a chiller.
7.	**Inductively coupled Plasma (ICP)**	a) 2 MHz or 13.56 MHz generator with automatic impedance matching network. It should also have a provision for manual matching. b) Optimized plasma source of power ≥ 1 kW. And the RF power should be adjustable, with forward, reflected power monitoring and remote control. c) Flange on top electrode for fitting a laser interferometer.
8.	**Plasma source**	a) RIE power supply to substrate electrode.Plasma source with power 600 W, 13.56 MHz and directly coupled automatic

		tuning,with forward, reflected power monitoring and remote control. It should also have a provision for manual matching. b) Automatic matching mode, controllable from 10Wto 600W with 1 W or lower resolution
9.	**Vacuum system**	a) Magnetically levitated turbomolecular pump with minimum throughput of 1300 litre/sec and provision for heating, with inert gas purge. It shall be corrosion resistant. b) Dry backing pump (with capacity of 1500 lpm or more) operating at high temperature (>130°C) c) ISO 200 (200 mm id) throttle valve for automatic pressure control with response time (<1s) (working pressure range from 1 mT up to 1 Torr). d) Separate penning gauge for high vacuum. e) 0 to 100 Torr capacitance gauge f) Vacuum pipework equipped with electrical heating up to 80° C.
10.	**Gas lines**	a) Gas pod for minimum 8 MFC controlled gas lines, fitted with 5 non-hazardous non-flammable lines (Ar, O_2, CF_4, CHF_3, SF_6), one non-toxic flammable gas- H_2 and two Toxic and corrosive gases (Cl_2 and BCl_3). Gas-pod must have an extraction port and be vented for safety. b) MFCs for non-hazardous non-flammable lines (Ar, O_2, CF_4, CHF_3, SF_6) and one non-toxic flammable gas- H_2must beviton sealed MFCs and MFCs for two toxic and corrosive gases (Cl_2 and BCl_3) must be metal sealed, with by-pass valves. MFCFlow rates in the range of 1 to 500 sccm for all the gases. One additional MFC for BCl_3 to be provided. c) Each line should be fitted with an electro-pneumatic isolation valve and an in-line 2 µm filter. d) The gas line for BCl_3 should be fitted with heating tape @ 40 °C. e) The provision for additional at least 2 gas lines should be provided with the system.
11.	**Vacuum loadlock**	a) Vacuum robot and end effector for 200 mm diameter substrates of weight up to 1.5 Kg. b) Inter-chamber Gate valve type: VAT MonoVAT. c) Suitable independent dry vacuum pump compatible with the loadlock chamber. d) Pirani vacuum gauge
12.	**Control system**	a) Computer controlled system with software compatible with OS Windows 10 or later versions. b) Intel®, i7 core processor, 16GB RAM, 500GB 2.5'' SATA HD or higher specs. c) Control system enabling an automatic leak check and automatic MFC check. d) Main system controller must be a programmable logic controller (PLC). e) The software should include full data logging capability of user-selectable run-time process parameters, to allow off-line verification and analysis of process conditions. f) The system should be capable of storing unlimited recipes. g) The system administrative rights should be editable by advanced user through the GUI. h) Graphical display of 32” sizefor visualization of recipes and process monitoring, with keyboard and mouse. i) User should be able to load multiple graphsof process parameters simultaneously. j) Ability to display alarms and alerts associated with recipe. k) Automatic tuning of RF matching network from process software, option for manual diagnostics and adjusting matching network manuallyfrom software for fine tuning ofprocess

13.	**Additional items**	a) Laser end-point detector with dedicated software for continuous monitoring of etching process. b) Dry scrubber compatible to the requested gases (10a) to be provided. c) Liners made of polypropylene/Teflon/PEEK or equivalent chemically resistant material should be provided (2 Nos.). d) Compatible closed-loop water chiller.
14.	**Safety**	a) The system should be fully interlocked to protect the hardware from any service failure (e.g. failed water supply for cooling purposes) and to protect the operator from electrical shock during maintenance procedures. a) The system should be left in a safe state, under vacuum, in case of any failure.
15.	**Other requirements**	a) The system should be commissioned and demonstrated for etch rate, selectivity, roughness, etched profile angle, uniformity to meet up to **four of the processes requested (including BK7, quartz, silicon, silicon nitride)**. The vendor must provide a detailed description of the measurement procedures of the above specificationsmentioned in section 2. b) Recipes to be provided for at least 10 requested processes with starting point and trend information. c) The vendor must have successfully completed at least 5 installations of ICP-RIE Systems in India. d) The system should be compatible and comply with class-1000 cleanroom environment standardsand must be CE compliant. e) The offered system shall be a 'brand new' system, and in no case shall use anyrefurbished item in building the same. Vendor must provide a certificate for this. f) Three-year warranty and five year AMC after completion of warranty period.

Note:

a) The specifications will be finalized after expression of interest.
b) Note: All the manufacturers from India as well as from global market are invited.

The meeting will be held as per schedule given below:-

Date: 09.06.2023
Time : 2.00 P.M. onwards
Venue: Conference Room 1, CSIR-CSIO and online as per link given below

Link:

https://meet.google.com/dmr-gagc-ami