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CSIR - ADVANCED MATERIALS & PROCESSES RESEARCH INSTITUTE
(वैज्ञानिक तथा औद्योगिक अनुसंधान परिषद्)
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TITLE: Expression of Interest for exploring market to find out likely sources for supply of Additive Micro Manufacturing System.

This Institute invites e-bids for Expression of Interest (EOI) through CPP Portal for supply Installation and Commissioning of **"**Additive Micro Manufacturing System**"**

The EOI should be submitted through CPP Portal latest by **25.08.2025 up to 11.00am** and shall be opened on **26.08.2025** at **11.00am**. A meeting with prospective bidders (Offline mode) has been scheduled to be held at **03:00 pm** on **26.08.2025** in the **meeting room of admin building, at CSIR-AMPRI, Bhopal**

Interested parties may depute their competent technical representatives to make presentation of their product/ model(s) and discuss with the Technical Sub Committee on the aspects of utility, technology, feature, literature, design, technical parameters, clientele and other related issues of the equipment. The Technical Sub Committee shall also evaluate the credentials/technical capabilities/financial standings with track record of the companies/ vendors attending meeting.

Process of EOI and Meeting:

Last date of submission of EOI 25.08.2025 up to 11.00am.

Opening of Bid: 26.08.2025 at 11.00am

Meeting with prospective bidders: on 26.08.2025 at 03.00 pm (Offline mode)

1) OEM/Suppliers/Indian Agent should:
   Submit e-bid for Expression of Interest through CPP Portal to participate in meeting latest by **25.08.2025 up to 11.00am**. along with Printed technical Literature duly indicating point to point AMPRI requirement and offered point to point technical compliance.
2) Attend meeting by fully Technical Competent personnel on: **26.08.2025 at 03.00 pm** to present before AMPRI Technical Sub Committee:

   i) Specific Model and make: meeting AMPRI technical specifications.
   ii) Power point presentation of AMPRI Technical specification requirement and its compliance.
   iii) One printed copy of Supporting Technical Literature.

Tentative Technical Specification are as per **Annexure – I**

Technically competent representative should be authorized for attending meeting who can take on the spot decision and confirm on the points raised by Technical Sub Committee. Technical representative should be able to sign the final technical specifications finalized by the CSIR-AMPRI Technical Sub Committee.

On the basis of EOI cum meeting, the technical committee may shortlist the parties for further course of procurement process keeping in mind the suitability and feasibility in terms of CSIR-AMPRI's requirement. All prospective bidders are invited to attend positively. Non-attendance / poor presentation may lead to rejection of the party in shortlisting process. However CSIR-AMPRI, keeps the liberty of deciding mode of procurement.

Interested parties may submit EOI in the form of e-bid through CPP Portal. Only online offers will be entertained from the registered bidders of CPP Portal. Last date of submission of EOI is 25.08.2025 up to 11.00am and shall be opened on 26.08.2025 at 11.00am.

Name & contact details of independent external monitor (IEM) for any violation related to provision of code of integrity & implementation of integrity pact related to this procurement, the details of OEM are as under:

i) Shri Jagadip Narayan Singh, IAS (retd.)
E.mail: jagadipsingh@yahoo.com

ii). Shri Arun Kumar Gupta, Ex-CMD
E.mail: guptaarun55@rediffmail.com

भंडार एवं क्रय अधिकारी /Stores & Purchase Officer

(Annexure- I)

Tentative Technical Specifications for Additive Micro Manufacturing System

Sr	Description	Specifications
1.	Function	The system should be able to print 3D metal structures with sub-micron resolution, as per input information (coordinates, process parameters, etc.) provided to the system. It should work at ambient conditions.
2.	Technique	Voxel-based 3D printing using electrochemical deposition is enabled by a Potentiostat that controls the potential (voltage) and monitors the current.
3.	Printing Chamber	Should accommodate substrate size of 15x15mm (with accessible print area of Ø 6mm) and substrate size of 25 x 25mm (with accessible print area of Ø 16mm). Separate printing chamber for Au metal.
4.	3D printing materials	Cu, Au, Ag, Pt
5.	3D copper printing rate	> 1 µm/s or more
6.	Cu Print Resolution (min voxel diameter)	< 1 µm
7.	Max Print XY Area:	Ø ~16 mm (limited to 2'000'000 μm^3 max print volume)
8.	Max Print Z height:	4 mm (limited to 2'000'000 μm^3 max print volume)
9.	Printing overhang angles	90 degrees
10.	Volumetric Printing Speed	150 $\mu m^3/s$
11.	Nozzle Diameter	300 – 500 nm
12.	Print Aspect ratio	100:1
	Sub-Systems	

	Details	
13.	Potentiostat	The potentiostat is to be fully integrated with the system software, control the potential (voltage range ± 3V), and monitor the current (Max current 20 mA).
14.	Microfluidics control system	Microfluidics control system to provide a low-noise, accurate, and stable control over the pressure that is required to dispense liquid through the iontip. • Pressure Range: -800 to + 1000 mbar • Sensor resolution: 0.5 mbar • Transient response time < 2.5 s • Steady state max. standard deviation < 1 mbar • Steady state average error (5s interval) < 1 mbar • Integrated leak detection
15.	Top View Camera	A high-resolution top-view camera to image the substrate on which structures are printed to provide alignment functionality • Resolution: 1.2 µm • Sensor Size: 2456 pixels x 2045 pixels • Field of view 2.8 mm x 2.4 mm • Magnification: 3X
16.	Bottom View Camera	A high-resolution bottom-view camera to be used for calibration purposes and ion tip alignment, and inspection • Resolution: 0.9 µm • Sensor size: 2456 pixels x 2045 pixels • Field of view 0.8 mm x 1.1 mm • Magnification: 8X
17.	XY Motorized Stages	• XY range 240 mm x 74 mm • Encoder resolution 1 nm • Bidirectional repeatability < 500 nm
18.	Z Motorized Stages	• Z range 60 mm • Encoder resolution 0.1 nm
19.	Data Acquisition System & Software	A computer with system software must be provided. Software (Voxel cloud generator, CAPA, MATLAB or any equivalent) should perform the following functions: • controls the printing process • Provide feedback to the user on the print success, failures, and possible print difficulties during printing and after printing. • Pre-defined parameter set-up for standard print ink recipes available from the vendor • Before printing, a computer-aided alignment step of the print design with existing structures on a substrate • Sequential printing of different and specific materials, depending on the electrochemical compatibility. • Software-based aid to generate printable designs in combination with the standard electrochemical metal print ink recipes provided by the vendor.
20.	Vibration	To dampen vibrations and prevent them from affecting the nano-

	Isolation	positioning stages and the highly accurate printing process.
21.	Power Supply	Voltage 220-230 VAC
22.	Accessories	• Ion Tips (300 nm size) – 200 pieces • Ion Tips (400 nm size) – 50 pieces • Ion Tips (500 nm size) – 50 pieces • Si wafers diced into 25 mm x 25 mm substrates; Ti/Cu coated (14 pcs) • Si wafers diced into 15 mm x 15 mm substrates; Ti/Cu coated (24 pcs) • Standard printing solution [Cu] (50 samples) • Accessory kit for printing solution [Cu] • Microliter pipette (300 pieces) • Plastic syringe (300 pieces) • Syringe filter (300 pieces) • Air compressor: Minimum 11 KW power air compressor *Noise level: Maximum 70 dB* *Outlet air must be completely dry. The Air dryer must be equipped for this purpose.* *Storage: Air receiver tank capacity ≥ 300 litres, with safety valve and drain.* *Outlet air must be free from dust and moisture. For this purpose, air compressor must be equipped with pre filter and after filter.* *The remaining moisture or additional moisture during rain (if any) must be removed through attaching an auto drain valve to air receiver (receiver available on site).* *PPR piping (10 meters) must be arranged to connect the air compressor to the desired equipment.* *One hose assembly must be added to prohibit the transfer of any vibration from air compressor to piping.* *Class F insulation shall be provided for electric insulation.* *The product must be ISO certified and the seller must be verified by OEM.* • UPS for 60 minutes of power backup • Two sets of electrodes (Graphite & Ag/AgCl)
23.	Workstation specification	• Intel® Xeon® Gold 6226R (2.9 GHz base frequency, up to 3.9 GHz with Intel® Turbo Boost or better • Technology, 22 MB L3 cache, 16 cores) • 128GB (4 x 32GB) DDR4 2933 ECC Registered RAM • 4TB (1 x 4TB)7200 SATA Enterprise HDD • 1TB Z Tubro PCIe NVMe OPAL 2 TCL SSD • SLIM DVDRW • NVIDIA RTX™ A4000 (16 GB GDDR6 dedicated)

		• PORTS: • Front: 1 headset connector; 4 USB 3.1 (1 charging) ; • Rear: 6 USB 3.1 Gen 1; 2 RJ-45 (1 GbE); 1 audio-in; 1 audio-out; 1 PS/2 mouse port; • 1 PS/2 keyboard port; 1 serial port • One set of keyboard and mouse and HP Slim Blu-ray Writer; latest office suit with perpetual license • 1125 W internal power supply, up to 90% efficiency, active PF • Windows 11 Pro 64 Workstation OS or latest • 2X30" or above UHD Monitor • Thunderbolt™ 4 technology and 4 ports of 10 GbE network connection or better, • vPro enabled wired LAN and/or Wi-Fi 6E WLAN and TPM 2.0 or better,
24.	Tool & Maintenance Kit	• Screwdriver TX1 & TX10 set • Hex key 2.0 sets • Tweezer's box • Substrate mounting tool • Convertor cable USB to RS232 • Stage cleaning and maintenance kit
25.	Installation & Training	• OEM or their trained engineers should perform Onsite System installation at no additional cost. System operation & maintenance training should be provided to the users for 5 days. • At least two permanent staff and four students need to be trained and trainer also needs to provide certificates to the trainee. • All the spare parts, including software and hardware be available for the smooth functioning of equipment at least for 10 years. The supplier should give the OEM a commitment for the availability of the software and hardware spare parts. • All the claims made by vendors in terms of the above-mentioned specifications should be validated utilizing authenticated documentary evidence along with performance certificates or quoted models in the tender document being submitted by them. They must produce authenticated documentary evidence, including a catalogue. • An authorised certificate/letter must be enclosed by the Vendor for the quoted model/company. • Vendor must have supplied at least 5 systems in India / globally.
26.	Warranty	2-year comprehensive warranty, During the warranty period, the cost of any parts that need to be repaired or replaced should be borne by the supplier/vendor. Logistic costs to and fro will also be borne by the supplier/vendor.
27.	AMC	Quotation for 3 years of comprehensive AMC after expiration of comprehensive warranty.