

**Domestic Tender notification for the procurement of 5 axis CNC machine (Last date: 16.06.2024) Date of publishing: 16.05.2024**

Dear Sir/Madam,

This is a domestic tender for the procurement of a 5 axis CNC machine for fabrication of a DED machine. Refer to Annexure 2 for eligibility criteria for domestic tender. The machine is required for accomplishing the goals of a DRDO-funded project. The 5 axis CNC workstation will be used for conducting research experiments for Metal 3D printing using Direct Energy Deposition technology. Machine should have an industry standard CNC controller that can be programmed and interfaced with external applications in Python, C, C# etc. The workstation will be integrated with a fiber laser, a powder feeder and sensors like pyrometers which will be procured separately. The integration will be done by IISc. The CNC controller should have the Inputs/ Outputs and control interfaces as below.

Vendor must have the capability to train our personnel on using the controller, and its expansion ports, integration options and programming options.

Vendor must provide their compliance to each of these points – failure could lead to disqualification.

**Minimum specifications**

<b>IISc requirement</b>
<b><u>CNC Workstation</u></b> <b><u>for</u></b> <b><u>Laser Additive Manufacturing - Direct Energy Deposition</u></b>
<b>CNC Workstation:</b> X axis : 300 mm travel Y axis : 200 mm Z axis : 300 mm B axis ( cradle type ) : -60 to +60 degree tilt C axis ( mounted on B axis – continuous 360 deg.) B and C axis are to be mounted in a trunnion configuration for simultaneous operation. T-slot mount points should be provided. Rotation – 200 mm dia rotating workplate Payload : Min 5kgs and max. 10 kg (combined weight workpiece, holders and sample) on C axis Servo motors with absolute encoders for driving the system Accuracy : $\pm 0.025$ mm Z axis carriage plate with matrix of holes to match cladding head Complete enclosed system with laser rated viewing window Vacuum pump to enable for Vacuum & Argon purge within 15-30 minutes
<b>CNC Controller</b> 5 axis CNC controller Minimum 16 Digital Inputs and 16 Digital Outputs <b>Laser Controller Module</b> with PWM and IO signals ( for Trumpf / IPG / nLight lasers ) <b>Powder Feeder Control Module</b> with 2 analog outputs

<p>Supports G-code files from standard CAM software like MasterCAM  PC connection via Ethernet port  <b>User Friendly Operation Software :</b>  allows basic control of system operation:  Setting of Laser power parameters Pulse frequency, and any other parameters.  Synchronized movements of XYZ and Rotary axis  Import of G-code files  Integrated running of complete system with laser control and powder feeder control  <b>User Friendly Diagnostic Software:</b>  Easy tool that helps in integration of system with additional hardware  Allows testing of Laser Controller Module and Powder Feeder Controller Module  Enables user to diagnose issues with system hardware and software  Step by step diagnostics</p>
Toolpost: Manual 4 station toolpost
High accuracy traverse on X and Z axis using ball screws
Axis Motor rating: 8Nm torque
PC-based CNC controller features: ISO standard G/M code based operation System must be upgradeable to accommodate laser based sensors for surface inspection
<b>Accessories :</b>
a. Chuck with 60mm or 100 mm dia 3 jaw to be provided
b. Tailstock to be provided (quote separately in the tender)
c. Toolpost mounting must have plate with tapped holes to fit the research tool provided by IISC.
<b>Additional points :</b>
1. A detailed 3D CAD model of the entire system assembly to the smallest component should be provided.
2. Warranty policy on components should be individually and clearly specified.
3. Nature and duration of post-sale support in case of breakdown, spares supply, troubleshooting etc. should be specified.
4. Nature and duration of technical support related to operation, programming, interfacing etc. should be specified.
<b>Other points :</b>
1. Confirm that, if required, you can give online demo and presentation or onsite demo at IISC for a presentation and demonstration of the points of concern to IISC.
2. Provide list of installations in CFTIs/IITs/NITs/Govt. Institutions and provide the contact details ( name, cell number and email ) of 3 customers

**GENERAL CONDITION**

Only those OEM/Supplier are considered who has the necessary spare parts available

In case of damage during delivery, the OEM should arrange for replacement.

### **Installation & Commissioning:**

The installation will be carried out by the OEM/ Supplier at the user's site at IISc Bangalore. Specify the utilities required for operation of the system. User manual to be provided .

**Training at site:** The supplier or his representative should impart training to IISc Bangalore.

### **Other specifications**

- a) Warranty of three years for all parts
- b) Spares should be provided for components for the period of warranty

### **Terms and conditions**

1. Two-bid system (separate technical and financial bids) in sealed tenders.
2. The technical bid must clearly specify the prescribed technical specifications without including the prices. Please provide in detail the specifications under each subhead and bullet point. Unique characteristics may be highlighted.
3. Vendors who include price information in the technical bids will be automatically disqualified.
4. Technical bids will be opened first. IISc may seek clarifications after opening of technical bids and may ask vendors to perform some example experiments on the samples given by IISc to demonstrate the promised technical specifications. Vendors may be required to give presentations.
5. There are several items that require detailed information to be provided by the supplier. If information is not provided against any of these items, this will disqualify the supplier.
6. After technical evaluation by a committee, vendors may be asked to re-quote in a specific format to facilitate comparison of prices.
7. Price bids of only technically qualified vendors will be considered.
8. The price must be quoted in INR (Indian Rupee). Quote should come only from Indian Original Equipment Manufacturer (OEM) or their Indian authorized distributor. The quotations should be on FOR-IISc Bangalore basis in INR only.
9. The price should be on FOR-IISc Bangalore basis in INR only.
10. IISc also reserves the right to cancel the tender at any time without assigning any reason whatsoever.
11. Indicate delivery period.
12. Order will be placed on lowest bid from technically qualified vendor.
13. Prices for the individual items should be quoted separately.

14. The tender documents can be sent at the following address:  
The Chairman  
Department of Materials Engineering  
Indian Institute of Science, Bangalore 560012  
Karnataka (INDIA)  
Attn: Prof. Abhik Narayan Choudhury

## **Annexure 2: Eligibility Criteria**

### **Prequalification criteria:**

- 1. The Bidder should belong to either class 1 or class 2 supplier distinguished by their “local content” as defined by recent edits to GFR. They should mention clearly which class they belong to in the cover letter.**
  - a) Class 1 supplier: Goods and services should have local content of equal to or more than 50%.**
  - b) Class 2 supplier: Goods and services should have local content of equal to or more than 20 % and less than 50%.**
- 2. Purchase preference as defined by the recent edits to GFR (within the “margin of purchase preference”) will be given to Class-1 supplier.**
- 3. MSME can seek exemption to some qualification criteria. IISc follows GFR2017 for such details.**
- 4. The Bidder must not be blacklisted/banned/suspended or have a record of any service-related dispute with any organization in India or elsewhere.**
- 5. Original Invoice, Original Warranty Certificate, Original Test Reports should be produced for all imported items from OEM (Original Equipment Manufacturer) at the time of supply of the equipments.**
- 6. Details of experienced service engineer including contact detail should be provided in tender document.**
- 7. Bidder shall have to submit audited accounts (Balance sheet profit and loss account) of financial year 2015-16, 2016-17 and 2017-18. Audited statement must be signed and stamped by qualified chartered accounted.**
- 8. Bidder must submit Income Tax return for assessment year – 2016-17, 2017-18 and 2018-19.**
- 9. Bidder must submit up to date sales tax or GST clearance certificate.**
- 10. Bidders offering imported products will fall under the category of non-local suppliers. They cannot claim themselves as Class-1 local suppliers/Class-2 local suppliers by claiming the services such as transportation, insurance, installation, commissioning, training, and other sales service support like AMC/CMC, etc., as local value addition.**