



ஹிஹ்ரஹ்; ஹிஹ்ரஹ் ஹிஹ்ரஹ் ஹிஹ்ரஹ் 600 036
INDIAN INSTITUTE OF TECHNOLOGY MADRAS
Chennai 600 036
Central Skill Training & Fabrication Facility'
(CSTF)



Tender No. IITM/CSTF/ 3D Printer /23-24/05

Due Date: 05.03.2024
Before 2.00 p.m.

Dear Sir/Madam,

On behalf of the Indian Institute of Technology Madras, Tenders are invited in two bid system namely Technical Bid and Financial Bid for

Supply of Industrial grade high speed FDM type 3D Printer

conforming to the specifications enclosed.

Tender Documents may be downloaded from Central Public Procurement Portal. All tender documents including Technical and Financial bids should be submitted as per the tender documents.

LAST DATE for receipt of Tender	:	05.03.2024 before 02.00 p.m.
Date & Time of opening of Tender	:	05.03.2024 @ 04.00 p.m.

1	Signing of Tender: The Tender is liable to be rejected if complete information is not given therein or if the particulars and date (if any) asked for in the schedule to the Tender are not fully filled in or not duly signed/authenticated. Specific attention is drawn to the delivery dates and terms and conditions enclosed herewith. Each page of the bids required to be signed and bears the official seal of the Bidders. If the application is made by a firm in partnership, it shall be signed (with seal) by all the partners of the firm above their full typewritten names and current addresses or alternatively by a partner holding power of attorney for the firm in which case a certified copy of the power of attorney shall accompany the application. A certified copy of the partnership deed along with current addresses of all the partners of the firm shall also accompany the application. If a limited company or a corporation makes the application, it shall be signed by a duly authorized person holding power of attorney for signing the application, in which case a certified copy of the power of attorney shall accompany the application. Such limited company or corporation may be required to furnish satisfactory evidence of its existence. The applicant shall also furnish a copy of the Memorandum of Articles of association duly attested by a Notary Public.
2	Period for which the offer will remain open: The Tender shall remain open for acceptance/validity till: 120 days from the date of opening of the tender. However, the day up to which the offer is to remain open being declared closed holiday for the Indian Institute of Technology Madras, the offer shall remain open for acceptance till the next working day.
3	Prices : <ul style="list-style-type: none">• The prices quoted must be Net considering all scope of supply, installation and terms & conditions mentioned in the tender document.• All conditional tenders will be summarily rejected.• Quote should be in INR only
4	Payment: up to 90% advance payment will be made with P.O against Proforma Invoice and balance 10% will be paid only after satisfactory completion of the supply, installation and as per terms and conditions of the purchase order.
5	Delivery: The delivery period shall be 30 days from the date of purchase order
6	GST: As applicable and should be quoted separately as per BOQ.
7	Terms and Conditions: Failure to comply with any of the instructions stated in this document or offering unsatisfactory explanations for

	non-compliance will lead to rejection of offers.
8	Right of Acceptance: IIT Madras reserves the right to reject the whole or any part of the Tender without assigning any reason or to accept them in part or full.
9	Communication of Acceptance: Letter of Intimation and acceptance will be communicated by post /email to the successful bidder to the address indicated in the bid.
10	All information including selection and rejection of technical or financial bids of the prospective bidders will be communicated through CPP portal. In terms of Rule 173(iv) of General Financial Rule 2017, the bidder shall be at liberty to question the bidding conditions, bidding process and/or rejection of bids.
11	Bidder shall submit along with this Tender: Name and full address of the Banker and their swift code and PAN No. and GSTIN number.
12	Jurisdiction: All questions, disputes, or differences arising under, out of or in connection with the contract, if concluded, shall be subject to the exclusive jurisdiction at the place from which the acceptance of tender is issued.
13	Penalty & Liquidated Damages / Force Majeure: If the selected Bidder fails to complete the due performance of the contract in accordance with the terms and conditions, Institute reserves the right either to cancel the contract or to accept performance already made by the selected Bidder after imposing Penalty on Selected Bidder. A penalty will be calculated on a per week basis and on the same Rate as applicable to Liquidated Damages (LD). In case of termination of the contract, Institute reserves the right to recover an amount equal to 5% of the Contract value as Liquidated Damages for non-performance. Both Penalty and Liquidated Damages are independent of each other and are applied separately and concurrently. Penalty and LD are not applicable for reasons attributable to the Institute and Force Majeure. However, it is the responsibility of the selected Bidder to prove that the delay is attributable to the Institute and Force Majeure. The selected Bidder shall submit the proof authenticated by the Bidder and Institute's official that the delay is attributed to the Institute and/or Force Majeure along with the bills requesting payment.
14	Warranty: 3 years warranty The bidder shall certify that the tender document submitted by him / her are of the same replica of the tender document as published by IIT Madras and no corrections, additions and alterations made to the same. If any deviation found in the same at any stage and date, the bid / contract will be rejected / terminated and actions will be initiated as per the terms and conditions of the contract.
15	PRE-QUALIFICATION CRITERIA Eligibility Criteria-I 1. The bidder shall not be from a country sharing land border with India and if the bidder is from a country sharing land border with India the bidder should have been registered with the competent authority as per orders of DIPP OM No. F. No. 6/18/2019-PPD dated 23rd July 2020, and MoCI Order No. P-45021/112/2020-PP (BE II) (E-43780) dated 24th August 2020. A declaration shall be submitted with the bid as per format given in Annexure – D . 2. Only 'Class-I local suppliers' and 'Class-II local suppliers', as defined under DIPP, MoCI Order No. P-45021/2/2017-PP (BE II) dated 16 th September 2020 and other subsequent orders issued therein, shall be eligible to bid in this tender. Declaration for Class-I / Class-II local suppliers should be submitted in the prescribed proforma format as per Annexure – E . Eligibility Criteria-II 1. The tender participating firm nor any of its partner has been blacklisted / debarred /involved / convicted in any criminal case / economic offence nor any criminal case / economic offence is pending against firm or any partner of the Firm before any Court of Law / Police. A self-declaration format given in Annexure – F . 2. The firm must have an aggregate Financial turnover of at least Rs.100 Lakhs in the last five financial years i.e. 2017-18, 2018-2019, 2019-2020, 2020-2021 and 2021-2022 and it should be duly certified by Chartered Accountant (Necessary document proof should be attached) 3. The bidder should be a Manufacturer (OEM) or Authorized Supplier/Dealer. Necessary document proof should be submitted as per Annexure-H . 4. The bidder or their OEM should have supplied at least 2 nos. of Industrial FDM 3D Printer with similar specifications in the last five years 2019, 2020, 2021, 2022 &2023 to the Central Government / Central PSU / Central/State Autonomous / reputed firms. A copy of Purchase order and Work Completion Certificates / Performance Certificate should be attached.

	<p>5. Bidder should submit self-declaration stating that the equipment maintenance and spare parts supply will be made at least 10 years from the day of installation at IIT Madras.</p> <p>6. Bidder should provide any spare parts at free of cost during the warranty period for the continuous working of the machine with a maximum interruption of one working day.</p> <p>7. Bidder should provide warranty for 3 years and options for extended AMC service support for additional 2 years.</p> <p>8. Bidder or OEM should provide one dedicated manpower to train the manpower & manage the machines for one week from the date of installation.</p>
16	<p>Number of Bids and their Submission: The bidders should submit the bids in two bid system as detailed below:</p> <p>Bid I Technical Bid The technical bid should consist of proof of EMD transfer, filled-in proforma of Technical bid submission as per details given in Annexure-B.</p> <p>The bidder should go through the technical bid (Annexure- A) of the tender document, understand the requirement of IITM before bidding and submit the technical bid covering the details given in Annexure-B along with all relevant documents proof. Any tender documents without these details shall be invalid and rejected.</p> <p>Bid II Financial Bid The financial bid should be submitted in excel format (BoQ) as per the proforma (Annexure C) and uploaded in the CPP e-procurement portal.</p>
17	<p>Evaluation of Bids:</p> <p>Stage I: Technical Bid evaluation Technical Bid Evaluation will be done in two stages.</p> <ol style="list-style-type: none"> 1. In the 1st stage, Bidder will be evaluated first for conformity with Pre-qualification Criteria (Eligibility criteria I &II) and those bidders who have complied with pre-qualification criteria will alone be evaluated further. 2. In the 2nd stage, the details of technical specification offered by the bidders will be evaluated by the technical committee for compliance. Only those bidders who have fully complied with Pre-Qualification Criteria and technical specification will be considered for opening of financial bid. Bidder will be evaluated first for conformity with Prequalification Criteria I &II. <p>Stage II: Financial Bid Evaluation The Lowest financial bid among those who have qualified in the Technical bid evaluation will be declared as successful bidder (L1) and the order will be awarded to successful bidder (L1).</p>
18	<p>Selection of successful bidder and Award of Order: The order will be directly awarded to the technically qualified bidder as per the condition in para 3A of DIPP, MoCI Order No. 45021/2/2017-PP (BE II) dated 16th September 2020.</p>
19	<p>The bidders will not be entertained to participate in opening of Bids. The opening of the bids may be checked using the respective login of the bidders.</p>
20	<p>The sealed bids should be submitted on or before due date to the following address:</p> <p style="text-align: center;">The Professor -In charge 'Central Skill Training & Fabrication Facility' (CSTF), (Formerly Central workshop) IIT Madras, Chennai- 600036</p>
21	<p>For any technical queries: Mr. P Hariharan Technical Officer, CSTF IIT Madras Email: harivision@iitm.ac.in</p>

**The Prof-In charge
Central Skill Training & Fabrication Facility
(CSTF)**

DECLARATION OF THE TENDERER

It is hereby acknowledged that I/We have gone through all the points listed under **“Specifications, Guidelines, Special Terms and Conditions”** of tender document are the same is abided and agreed to be executed. In case, if any of the information furnished by me/us is found false, I/We are fully aware that the tender /contract will be rejected / cancelled by IIT Madras and EMD shall be forfeited.

Signature of the Bidder
Name & Address of the Bidder
with Office Stamp

TECHNICAL BID
Supply of Industrial grade high speed FDM type 3D Printer
Tender No. IITM/CSTF/ 3D Printer /23-24/05

I. PRE-QUALIFICATION CRITERIA

Eligibility Criteria-I

1. The bidder shall not be from a country sharing land border with India and if the bidder is from a country sharing land border with India the bidder should have been registered with the competent authority as per orders of DIPP OM No. F. No. 6/18/2019-PPD dated 23rd July 2020, and MoCI Order No. P- 45021/112/2020-PP (BE II) (E-43780) dated 24th August 2020. A declaration shall be submitted with the bid as per format given in **Annexure – D**.
2. Only 'Class-I local suppliers' and 'Class-II local suppliers', as defined under DIPP, MoCI Order No. P- 45021/2/2017-PP (BE II) dated 16th September 2020 and other subsequent orders issued therein, shall be eligible to bid in this tender. Declaration for Class-I / Class-II local suppliers should be submitted in the prescribed proforma format as per **Annexure – E**.

Eligibility Criteria-II

1. The tender participating firm nor any of its partner has been blacklisted / debarred /involved / convicted in any criminal case / economic offence nor any criminal case / economic offence is pending against firm or any partner of the Firm before any Court of Law / Police. A self-declaration format given in Annexure – F.
2. The firm must have an aggregate Financial turnover of at least Rs.100 Lakhs in the last five financial years i.e. 2017-18, 2018-2019, 2019-2020, 2020-2021 and 2021-2022 and it should be duly certified by Chartered Accountant (Necessary document proof should be attached)
3. The bidder should be a Manufacturer (OEM) or Authorized Supplier/Dealer. Necessary document proof should be submitted as per Annexure-H.
4. The bidder or their OEM should have supplied at least 2 nos. of Advance EDM Drill Machine and Die Sinking EDM with similar specifications in the last five years 2019, 2020, 2021, 2022 &2023 to the Central Government / Central PSU / Central/State Autonomous / reputed firms. A copy of Purchase order and Work Completion Certificates / Performance Certificate should be attached. Bidder should submit self-declaration stating that the equipment maintenance and spare parts supply will be made at least 10 years from the day of installation at IIT Madras.
5. Bidder should submit self-declaration stating that the equipment maintenance and spare parts supply will be made at least 10 years from the day of installation at IIT Madras.
6. Bidder should provide any spare parts at free of cost during the warranty period for the continuous working of the machine with a maximum interruption of one working day.
7. Bidder should provide warranty for 3 years and extended AMC service support for additional 2 years. During these additional 2 years period IITM will absorb the cost of spares.
8. Provide one dedicated manpower from the bidder or their authorized dealers to train the manpower & manage the machines for 3 months from the date of installation, and this can be extended for 5 years at no cost on demand from IIT-Madras.

Sl. No.	Technical Specifications	
1	Industrial grade high speed FDM type 3D Printer - Quantity – 1 No.	
	<p>Requirement is for the Supply, Installation and Commissioning of Industrial Fused Deposition Modelling Machine capable of manufacturing prototype and production parts using opensource standard industrial thermoplastics and fiber reinforced thermoplastics together with supply of accessories required for the machine and raw material filaments.</p> <p>Industrial grade high speed Fused Deposition Modelling type 3 D printer Fused deposition modeling with Two Independently Position-able and Controllable Extruders (IDEX), suitable for printing industrial thermoplastic materials in multi-material mode, Duplication mode and Mirror-Mode Functional prototypes, Fabrication display models Jigs and fixtures, Tooling, and molds of composite, End use parts. The machine should be compatible with all standard open-source 3D Printing engineering thermoplastics materials and support materials available in the open market in spool format. Machine using only proprietary spools / proprietary material cartridge will not be accepted. The detailed specifications of the requirement and the scope of supply is given in the following paragraphs.</p>	
	Maximum Print Job Envelop Size (Build Volume)	≥ 600mm x 600 mm x 400 mm (XYZ) (140-150 liters build volume)
	Print Speed	≥ 300 mm/sec
	Build Rate	≥ 25 cm ³ /hour
	Extruder Nozzle Diameters Supported	0.25 mm 0.4 mm 0.6 mm 0.8 mm
	Ready to Use Time	Within 5 minutes of power on
	Battery Backup	Up to 5 hours
	Data Acquisition Speed	1 million points per second or higher
	Supported Filament Diameter	Minimum 1.5 mm to 1.75 mm
	Accuracy & Resolution	
	Positioning Accuracy of X, Y & Z Axes	≤15 microns
	Print Accuracy	≤ 0.15 % of geometry (typical 150 microns)
	Layer Resolution	≤ 50 microns for 0.2 mm nozzle to ≤ 150 microns for 0.8 mm nozzle
	Extruder Capabilities	
Extruder Type	Servo Driven Hybrid Drive Extruder: Redundant Bowden Extruder with Dual Drive gears + Planetary Gearbox Direct Drive Extruder for each filament path.	
Extruder Nozzle Material	Hardened Steel / Brass suitable for materials having high.	

	hardness and high-temperature requirement
Number of extruders	Two Independently Driven Extruders capable of: 1. Single part for deposition of model and support material. 2. Duplication Mode, two copies of the same part being printed simultaneously. 3. Mirror Mode: Two Mirror copies of the same part being printed simultaneously
Extruder temperature	Max 300 °C ± 2 °C with precision temperature control system
Maximum Platform Temperature:	atleast100 °C
	Provision of replacement of customized extruders/ nozzles should be available using Quick Swappable CAN Bus based Extruder with Automotive Grade Connectors
Machine Features	
Fully Covered Chamber of Sheet-Metal Construction(Anodized aluminum or powder coated steel) with Integrated Storage for Material and Tools.	
Material feeding system should also be covered	
Activated Alumina based recirculating hot-air Filament Dryer & dehumidification storage For drying spools upto 3KG	
Transparent door for print visualization	
Industrial Safety: Integrated Emergency Stop, Switchgear & HEPA Filter.	
Heated bed with controlled heating	
Required temperature 120 ± 5°C	
Hybrid CORE-XY Motorized Gantry, with Independently movable extruders	
Extruders can move independently of each other for full IDEX control	
High precision linear guide rails with 20- micron positional accuracy or better	
Precision motorized Z axis movement with ball screw or leadscrew with anti-backlash mechanism and auto bed leveling	
In-built camera connected to HMI or PC-based software. for monitoring the printing process	
Fast response Filament sensor for detection of filament movement, filament breakage etc. for continuous	
Automatically Pausing when Extruder Clog/Filament Runout Detected with Manual Resuming	
Minimum 5 inch Touch screen based dedicated HMI for operations and maintenance integrated to machine	
PC based software with perpetual license	
Solid model input format: STL	
High precision linear guide rails with 20- micron positional accuracy or better	
Compatible with CAD tools like SolidWorks - Direct print option from CAD tools	
Capability to process STL files generated through 3D. scanners/reverse engineering methods.	
Automatic model slicing and layer visualization	
Automatic support generation with customization features	
Customization of sparse build	
Large part build feature – by sectioning and feature alignment capabilities	

	Automatic selection of process parameters for selected materials/ nozzles etc.
	Part packing and nesting feature
	Estimation of material consumption
	Estimation of build time
	Automatic generation of honeycomb like lattice structure from a solid as input – customizable density
	Pause and start print capability
	Diagnostic features – alarms and interlocks for critical process and machine parameters
	Machine data logging including errors / alarms etc.
	Auto job recovery / repair for uninterrupted printing in case of Power Outage
	Compatible with CAD tools like SolidWorks - Direct print option from CAD tools
	Capability to process STL files generated through 3D. scanners/reverse engineering methods.
	Ability to support detailed views of build model, tray, and slice preview for making necessary adjustments before printing job
	OS compatibility: Microsoft windows 10 or above
	Material Presets and Material Printing Parameters in Slicing Software for all materials
	Pause and print operations should be allowed to accommodate external material/ objects as an insert in the print jobs. Manually exclude G codes during run time.
	Ability to exclude G Codes manually during build by adding exclude region, where nothing gets printed.
	Resume the print from the same point after power failure.
	LAN
	Display lock – lock the machine touch screen with pin/password
2	Accessories:
2.1	Computer System I7 7/8 th Gen with Windows 10/11, 16 GB RAM, 1TB HDD/256GB SSD , 4 GB Graphic Card, 27-inch Monitor loaded with all required software and with 3 years warranty – quantity – 1 no.
2.2	Machine table – 1 no
2.3	Build Plate 5 Nos Replaceable PEI coated flexible spring steel bed for ABS, PLA, PVA and Others
2.4	Brass Nozzles of size 0.4 mm, 0.6 mm, 0.8 mm – each 1 no
2.5	Storage cabinet – 1 no
2.6	Filament drier
2.7	Filament materials – 5nos. of PLA, ABS, PP, PC & PU and same should be demonstrated during installation
a)	Polylactic Acid (PLA)
b)	Tough PLA
c)	PLA+
d)	Polyvinyl Alcohol (PVA)
e)	PVA+
f)	Poly Propylene (PP)
g)	Co Polyamide (CoPA) / Nylon 6
h)	Polyamide 12 (PA 12) / Nylon 12
i)	Acrylonitrile Butadiene Styrene (ABS)
j)	High Impact Polystyrene (HIPS)
k)	Polyethylene Terephthalate Glycol (PETG)

	l)	Polycarbonate (PC)
	m)	Poly(lactic Acid + Acrylonitrile Butadiene Styrene (PC-ABS)
	n)	Thermoplastic Polyurethane (TPU)
		Composite:
	o)	Carbon Fiber PLA (CF-PLA)
	p)	Carbon Fiber PA12 (CF-PA12 / CF Nylon)
2.8		Support material: HIPS or equivalent (Non – hygroscopic soluble material) – 4 nos With a minimum shelf life of 1 year from date of supply
2.9		Documentation
		Operations and maintenance manual
		Site preparation guide – with utilities requirement
		Datasheets of materials and consumables
		Material Safety Data Sheet (MSDS) of chemicals/ materials
		Document certifying that the system offered is brand new and not refurbished/ remanufactured
		Authorization certificate from OEM, if equipment is sold by authorized dealer
		Certification
		Mandatory ISO certification
		Mandatory Make in India with MII Content
		Acceptance test plan
		Pre-dispatch (PDI) inspection:
		PDI will be carried out at factory/ suppliers' location with following PDI Parameters: - Physical inspection to check conformity of machine dimensions/ build volume and all hardware and Software features as mentioned in the specifications. - Fabricating standard calibration job to check – print speed, build rate, layer precision, position accuracy etc. - Fabricating standard adjustable spanner in ABS- to check compatibility of machine to fabricate functional prototypes using support material. Utility of the adjustable spanner will be checked after fabrication. - Fabricating of suitable model to demonstrate the required software capabilities Fabricating of suitable model with metal block insert to demonstrate pause and print option
		Post Delivery Inspection:
		After supply of the equipment, hardware, software, spares, and consumables as per the Scope of Supply all above mentioned PDI tests will be carried out after installation and commissioning of the machine.
		All the consumables and Material Spools required for PDI, Post Delivery Inspection and Training are Industry Partner's Scope.
		Installation, Commissioning, Training
	Free installation and commissioning of the Machine, Software and Accessories to be done at designated location.	
	Free Training for One week at on Machine Operation, Software Operation, Model Preparation, Post Processing, Maintenance, Trouble Shooting and Safety Aspects.	
	Consumables for Commissioning, Initial Operations for Machine Prove Out and Training	
	Nozzles, Build Materials, Build Plates and Consumables like Solvents, Cleaners, Post Processing Consumables etc required for Machine Commissioning, Acceptance Tests and Training (Startup Kit) at IIT MADRAS is Industry Partner's Scope.	
	Startup Kit as mentioned above is exclusive of the Spares, Accessories and Materials	

	ordered as part of the RFP.
3.0	<p>Sample Printed Parts for Technical Bid Evaluation Post Bid, IIT will share SAT/STL files (3 to 4 Parts) for printing samples on the quoted machine model for technical evaluation of the print capabilities of the machine. The bidder should have capability to print the parts based on need of technical committee during technical bid evaluation preferably at any bidder designated place at Factory or at service centre in Chennai on the quoted model (Technical team will witness the manufacturing physically or stage by stage over video conference) The sample part materials will be specified along with the file (PA-12, TPU, PP, CF-PA12) Post print, the samples are to be sent to IIT MADRAS for quality checks. Removal of support materials should not be done on Printed Samples Post Processing Should not be done on Printed Samples.</p>

ANNEXURE - B

PROFORMA FOR TECHNICAL BID
Supply of Industrial grade high speed FDM type 3D Printer
Tender No. IITM/CSTF/ 3D Printer /23-24/05

A. PRE-QUALIFICATION CRITERIA

Sl. No.	Description	Compliance (Yes/No)	Page Ref.No.
PRE-QUALIFICATION CRITERIA			
I. ELIGIBILITY CRITERIA - I			
1	The bidder shall not be from a country sharing land border with India and if the bidder is from a country sharing land border with India the bidder should have been registered with the competent authority as per orders of DIPP OM No. F. No. 6/18/2019-PPD dated 23rd July 2020, and MoCI Order No. P- 45021/112/2020-PP (BE II) (E-43780) dated 24th August 2020. A declaration shall be submitted with the bid as per format given in Annexure – D .		
2	Only 'Class-I local suppliers' and 'Class-II local suppliers', as defined under DIPP, MoCI Order No. P- 45021/2/2017-PP (BE II) dated 16th September 2020 and other subsequent orders issued therein, shall be eligible to bid in this tender. Declaration for Class-I / Class-II local suppliers should be submitted in the prescribed proforma format as per Annexure – E.		
II. ELIGIBILITY CRITERIA - II			
1	The tender participating firm nor any of its partner has been blacklisted / debarred /involved / convicted in any criminal case / economic offence nor any criminal case / economic offence is pending against firm or any partner of the Firm before any Court of Law / Police. A self-declaration format given in Annexure – F.		
2	The firm must have an aggregate Financial turnover of at least Rs.100 Lakhs in the last five financial years i.e. 2017-18, 2018-2019, 2019-2020, 2020-2021 and 2021-2022 and it should be duly certified by Chartered Accountant (Necessary document proof should be attached)		
3	The bidder should be a Manufacturer (OEM) or Authorized Supplier/Dealer. Necessary document proof should be submitted as per Annexure-H .		
4	The bidder or their OEM should have supplied at least 2 nos. of Industrial grade high speed FDM type 3D Printer with similar specifications in the last five years 2019, 2020, 2021, 2022 &2023 to the Central Government / Central PSU / Central/State Autonomous / reputed firms. A copy of Purchase order and Work Completion Certificates / Performance Certificate should be attached. Bidder should submit self-declaration stating that the equipment maintenance and spare parts supply will be made at least 10 years from the day of installation at IIT Madras.		

5	Bidder should submit self-declaration stating that the equipment maintenance and spare parts supply will be made at least 10 years from the day of installation at IIT Madras.		
6	Bidder should provide any spare parts at free of cost during the warranty period for the continuous working of the machine with a maximum interruption of one working day.		
7	Bidder should provide warranty for 3 years and options for extended AMC service support for additional 2 years.		
8	Bidder or OEM should provide one dedicated manpower to train the manpower & manage the machines for one week from the date of installation.		

B. TECHNICAL SPECIFICATION

Sl. No.	Technical Specifications	Compliance (Yes/No)	Page Ref.No.	
1	Industrial grade high speed FDM type 3D Printer - Quantity – 1 No.			
	Requirement is for the Supply, Installation and Commissioning of Industrial Fused Deposition Modelling Machine capable of manufacturing prototype and production parts using opensource standard industrial thermoplastics and fiber reinforced thermoplastics together with supply of accessories required for the machine and raw material filaments. Industrial grade high speed Fused Deposition Modelling type 3 D printer Fused deposition modeling with Two Independently Position-able and Controllable Extruders (IDEX), suitable for printing industrial thermoplastic materials in multi-material mode, Duplication mode and Mirror-Mode Functional prototypes, Fabrication display models Jigs and fixtures, Tooling, and molds of composite, End use parts. The machine should be compatible with all standard open-source 3D Printing engineering thermoplastics materials and support materials available in the open market in spool format. Machine using only proprietary spools / proprietary material cartridge will not be accepted. The detailed specifications of the requirement and the scope of supply is given in the following paragraphs.			
	Maximum Print Job Envelop Size (Build Volume)	≥ 600mm x 600 mm x 400 mm (XYZ) (140-150 liters build volume)		
	Print Speed	≥ 300 mm/sec		
	Build Rate	≥ 25 cm ³ /hour		
	Extruder Nozzle Diameters Supported	0.25 mm 0.4 mm 0.6 mm 0.8 mm		
	Ready to Use Time	Within 5 minutes of power on		
	Battery Backup	Up to 5 hours		
	Data Acquisition Speed	1 million points per second or higher		
	Supported Filament Diameter	Minimum 1.5 mm to 1.75 mm		
	Accuracy & Resolution			
	Positioning Accuracy of X, Y & Z Axes	≤15 microns		
	Print Accuracy	≤ 0.15 % of geometry (typical 150 microns)		
	Layer Resolution	≤ 50 microns for 0.2 mm nozzle to ≤ 150 microns for 0.8 mm nozzle		
	Extruder Capabilities			
Extruder Type	Servo Driven Hybrid Drive Extruder: Redundant Bowden Extruder with Dual Drive gears + Planetary Gearbox Direct Drive Extruder for each filament path.			

Extruder Nozzle Material	Hardened Steel / Brass suitable for materials having high hardness and high-temperature requirement	
Number of extruders	Two Independently Driven Extruders capable of: 1. Single part for deposition of model and support material. 2. Duplication Mode, two copies of the same part being printed simultaneously. 3. Mirror Mode: Two Mirror copies of the same part being printed simultaneously	
Extruder temperature	Max 300 °C ± 2 °C with precision temperature control system	
Maximum Platform Temperature:	atleast100 °C	
	Provision of replacement of customized extruders/ nozzles should be available using Quick Swappable CAN Bus based Extruder with Automotive Grade Connectors	
Machine Features		
Fully Covered Chamber of Sheet-Metal Construction(Anodized aluminum or powder coated steel) with Integrated Storage for Material and Tools.		
Material feeding system should also be covered		
Activated Alumina based recirculating hot-air Filament Dryer & dehumidification storage For drying spools upto 3KG		
Transparent door for print visualization		
Industrial Safety: Integrated Emergency Stop, Switchgear & HEPA Filter.		
Heated bed with controlled heating		
Required temperature 120 ± 5°C		
Hybrid CORE-XY Motorized Gantry, with Independently movable extruders		
Extruders can move independently of each other for full IDEX control		
High precision linear guide rails with 20- micron positional accuracy or better		
Precision motorized Z axis movement with ball screw or leadscrew with anti-backlash mechanism and auto bed leveling		
In-built camera connected to HMI or PC-based software. for monitoring the printing process		
Fast response Filament sensor for detection of filament movement, filament breakage etc. for continuous		
Automatically Pausing when Extruder Clog/Filament Runout Detected with Manual Resuming		
Minimum 5 inch Touch screen based dedicated HMI for operations and maintenance integrated to machine		
PC based software with perpetual license		
Solid model input format: STL		
High precision linear guide rails with 20- micron positional accuracy or		

	better		
	Compatible with CAD tools like SolidWorks - Direct print option from CAD tools		
	Capability to process STL files generated through 3D. scanners/reverse engineering methods.		
	Automatic model slicing and layer visualization		
	Automatic support generation with customization features		
	Customization of sparse build		
	Large part build feature – by sectioning and feature alignment capabilities		
	Automatic selection of process parameters for selected materials/ nozzles etc.		
	Part packing and nesting feature		
	Estimation of material consumption		
	Estimation of build time		
	Automatic generation of honeycomb like lattice structure from a solid as input – customizable density		
	Pause and start print capability		
	Diagnostic features – alarms and interlocks for critical process and machine parameters		
	Machine data logging including errors / alarms etc.		
	Auto job recovery / repair for uninterrupted printing in case of Power Outage		
	Compatible with CAD tools like SolidWorks - Direct print option from CAD tools		
	Capability to process STL files generated through 3D. scanners/reverse engineering methods.		
	Ability to support detailed views of build model, tray, and slice preview for making necessary adjustments before printing job		
	OS compatibility: Microsoft windows 10 or above		
	Material Presets and Material Printing Parameters in Slicing Software for all materials		
	Pause and print operations should be allowed to accommodate external material/ objects as an insert in the print jobs. Manually exclude G codes during run time.		
	Ability to exclude G Codes manually during build by adding exclude region, where nothing gets printed.		
	Resume the print from the same point after power failure.		
	LAN		
	Display lock – lock the machine touch screen with pin/password		
2	Accessories:		
2.1	Computer System I7 7/8 th Gen with Windows 10/11, 16 GB RAM, 1TB HDD/256GB SSD , 4 GB Graphic Card, 27-inch Monitor loaded with all required software and with 3 years warranty – quantity – 1 no.		
2.2	Machine table – 1 no		
2.3	Build Plate 5 Nos Replaceable PEI coated flexible spring steel bed for ABS, PLA, PVA and Others		
2.4	Brass Nozzles of size 0.4 mm, 0.6 mm, 0.8 mm – each 1 no Hardened Nozzle of size 0.4mm, 0.6mm, 0.8mm – each 1 no		
2.5	Storage cabinet – 1 no		
2.6	Filament drier		
2.7	Filament materials – 5nos. of PLA, ABS, PP, PC & PU and same should be demonstrated during installation		

c	Polylactic Acid (PLA)		
r	Tough PLA		
s	PLA+		
t	Polyvinyl Alcohol (PVA)		
u	PVA+		
v	Poly Propylene (PP)		
v	Co Polyamide (CoPA) / Nylon 6		
x	Polyamide 12 (PA 12) / Nylon 12		
y	Acrylonitrile Butadiene Styrene (ABS)		
z	High Impact Polystyrene (HIPS)		
a	Polyethylene Terephthalate Glycol (PETG)		
b	Polycarbonate (PC)		
c	Polylactic Acid + Acrylonitrile Butadiene Styrene (PC-ABS)		
c	Thermoplastic Polyurethane (TPU)		
	Composite:		
e	Carbon Fiber PLA (CF-PLA)		
f	Carbon Fiber PA12 (CF-PA12 / CF Nylon)		
2.8	Support material: HIPS or equivalent (Non – hygroscopic soluble material) – 4 nos With a minimum shelf life of 1 year from date of supply		
	Documentation		
	Operations and maintenance manual		
	Site preparation guide – with utilities requirement		
	Datasheets of materials and consumables		
	Material Safety Data Sheet (MSDS) of chemicals/ materials		
	Document certifying that the system offered is brand new and not refurbished/ remanufactured		
	Authorization certificate from OEM, if equipment is sold by authorized dealer		
	Certification		
	Mandatory ISO certification		
	Mandatory Make in India with MII Content		
	Acceptance test plan		
	Pre-dispatch (PDI) inspection:		
2.9	PDI will be carried out at factory/ suppliers’ location with following PDI Parameters: - Physical inspection to check conformity of machine dimensions/ build volume and all hardware and Software features as mentioned in the specifications. - Fabricating standard calibration job to check – print speed, build rate, layer precision, position accuracy etc. - Fabricating standard adjustable spanner in ABS- to check compatibility of machine to fabricate functional prototypes using support material. Utility of the adjustable spanner will be checked after fabrication. - Fabricating of suitable model to demonstrate the required software capabilities Fabricating of suitable model with metal block insert to demonstrate pause and print option		
	Post Delivery Inspection:		

	After supply of the equipment, hardware, software, spares, and consumables as per the Scope of Supply all above mentioned PDI tests will be carried out after installation and commissioning of the machine.		
	All the consumables and Material Spools required for PDI, Post Delivery Inspection and Training are Industry Partner's Scope.		
	Installation, Commissioning, Training		
	Free installation and commissioning of the Machine, Software and Accessories to be done at designated location.		
	Free Training for One week at on Machine Operation, Software Operation, Model Preparation, Post Processing, Maintenance, Trouble Shooting and Safety Aspects.		
	Consumables for Commissioning, Initial Operations for Machine Prove Out and Training		
	Nozzles, Build Materials, Build Plates and Consumables like Solvents, Cleaners, Post Processing Consumables etc required for Machine Commissioning, Acceptance Tests and Training (Startup Kit) at IIT MADRAS is Industry Partner's Scope.		
	Startup Kit as mentioned above is exclusive of the Spares, Accessories and Materials ordered as part of the RFP.		
3.0	<p>Sample Printed Parts for Technical Bid Evaluation</p> <p>Post Bid, IIT will share SAT/STL files (3 to 4 Parts) for printing samples on the quoted machine model for technical evaluation of the print capabilities of the machine.</p> <p>The bidder should have capability to print the parts based on need of technical committee during technical bid evaluation preferably at any bidder designated place at Factory or at service centre in Chennai on the quoted model (Technical team will witness the manufacturing physically or stage by stage over video conference)</p> <p>The sample part materials will be specified along with the file (PA-12, TPU, PP, CF-PA12)</p> <p>Post print, the samples are to be sent to IIT MADRAS for quality checks.</p> <p>Removal of support materials should not be done on Printed Samples</p> <p>Post Processing Should not be done on Printed Samples.</p>		

PROFORMA FOR FINANCIAL BID (BoQ)**Supply of Industrial grade high speed FDM type 3D Printer****Tender No. IITM/CSTF/ 3D Printer /23-24/05**

Sl. No.	Item Description	Qty.	Unit Rate (in INR)	GST (in %)	Total Amount with GST (in INR)
1	Industrial grade high speed FDM type 3D Printer as per technical specifications of the bid	1			
2	Accessories as per section 2 in technical specifications	As per list			
GRAND TOTAL**					

NOTE:

** The rate should be inclusive of in supply, installation and commissioning of printers and other associated hardware.

Place:

Date:

Signature of the Bidder
Name & Address of the
Bidder with Office Stamp

(To be given on the letter head of the bidder)

No. _____

Dated: _____

CERTIFICATE

I have read the clause regarding restrictions on procurement from a bidder of a country which shares a land border with India and hereby certify that I am not from such a country.

OR (whichever is applicable)

I have read the clause regarding restrictions on procurement from a bidder of a country which shares a land border with India and hereby certify that I from _____ (Name of Country) and has been registered with the Competent Authority. I also certify that I fulfill all the requirements in this regard and is eligible to be considered.

(Copy/ evidence of valid registration by the Competent Authority is to be attached)

Place:

Date:

Signature of the Bidder
Name & Address of the
Bidder with Office Stamp

**FORMAT FOR SELF-CERTIFICATION UNDER PUBLIC PROCUREMENT POLICY
(PREFERENCE TO MAKE IN INDIA) 2017**

**Tender Reference No. Tender No. IITM/CSTF/ 3D Printer /23-24/05
Name of the Product / Service: Supply of Industrial grade high speed FDM type 3D Printer**

Date: _____

I/We _____ S/o, D/o, W/o, _____ resident
of _____ hereby solemnly
affirm and declare as under:

That I will agree to abide by the terms and conditions of the Public Procurement (Preference to Make in India) Policy vide GoI Order no. P-45021/2/2017-PP (B.E.-II) dated 15.06.2017 (subsequently revised vide orders dated 28.05.2018, 29.05.2019 and 04.06.2020) MOCI order No. 45021/2/2017-PP (BE II) Dt.16th September 2020 & P- 45021/102/2019-BE-II- Part(1) (E-50310) Dt.4th March 2021 and any subsequent modifications/Amendments, if any and

That the local content for all inputs which constitute the said item/service/work has been verified by me and I am responsible for the correctness of the claims made therein.

Tick (✓) and Fill the Appropriate Category	
<input type="checkbox"/>	I/We _____ [name of the supplier] hereby confirm in respect of quoted items that Local Content is equal to or more than 50% and come under “ Class-I Local Supplier ” category.
<input type="checkbox"/>	I/We _____ [name of the supplier] hereby confirm in respect of quoted items that Local Content is equal to or more than 20% but less than 50% and come under “ Class-II Local Supplier ” category.

The details of the location (s) at which the local value addition is made and the proportionate value of local content in percentage

Percentage of Local content : _____ %**
Location at which value addition done : _____

For and on behalf of (Name of firm/entity)

Authorized signatory (To be duly authorized by the Board of Directors)

<Insert Name, Designation and Contact No.>

[Note: In case of procurement for a value in excess of Rs. 10 Crores, the bidders shall provide this certificate from statutory auditor or cost auditor of the company (in the case of companies) or from a practicing cost accountant or practicing chartered accountant (in respect of suppliers other than companies) giving the percentage of local content.]

This letter should be on the letterhead of the quoting firm and should be signed by a competent authority.

** Services such as transportation, insurance, installation, commissioning, and training and after sales service support like AMC/CMC cannot be claimed as local value addition

<Insert Name, Designation and Contact No.>

(To be given on the letter head of the bidder)

Self-Declaration that the Service Provider has not been Blacklisted

I S/o
R/o police station District Director
/ partner/ sole proprietor (Strike out whichever is not applicable) of
..... (Firm or Company) do hereby declare and solemnly affirm:

- I. That the Firm has not been Blacklisted or declared insolvent by any of the Union or State Government / Organization.
- II. That none of the individual / firm / Company Blacklisted or any partners or shareholder thereof has any connection directly or indirectly with or has any subsistence interest in the deponent business / firm company.
- III. That neither the Firm nor any of its partner has been involved / convicted in any criminal case / economic offence nor any criminal case / economic offence is pending against firm or any partner of the Firm before any Court of Law / Police.

Place:
Date:

Signature of the Bidder
Name & Address of the
Bidder with Office Stamp

Tender Reference No. Tender No. IITM/CSTF/ 3D Printer /23-24/05
Name of the Product / Service: Supply of Industrial grade high speed FDM type 3D Printer

OEM CERTIFICATION FORM
(in Original Letter Head of OEM)

Tender No: Dated:

We are Original Equipment Manufacturers (OEM) of (Name of the company)
M/s (Name of the vendor) is one of our
Distributors/Dealers/Resellers/Partners (tick one) for the and is
participating in the above mentioned tender by offering our product model..... (Name of
the product with model number).

..... is authorized to bid, sell and provide service support warranty for our
product as mentioned above.

Name and Signature of the authorized
Signatory of OEM along with
Seal of the company with Date