



NATIONAL INNOVATION FOUNDATION - INDIA
(Autonomous Body of Department of Science & Technology, Govt. of India)

TENDER DOCUMENT

FOR

**SUPPLYING OF MACHINES/ EQUIPMENTS AND
SOFTWARES FOR FAB LAB / WORKSHOP**

Tender Fee Rs. 500/-

Date of Tender Issue	: 31/10/2018 at 12:00 hrs
Last date of Tender submission	: 22/11/2018 at 10:30 hrs
Opening of Technical Bids	: 22/11/2018 at 11:00 hrs
Opening of Financial Bids	: 26/11/2018 at 14:00 hrs

National Innovation Foundation-India is an Autonomous Body of the Department of Science and Technology, Govt. of India providing institutional support to grassroots innovators and outstanding traditional knowledge holders.

NIF invites sealed tender for supplying of machines and equipment's for workshop. The sealed bidding documents should be delivered in the Administration Section of NIF on or before the stipulated date and time. The technical bid and the financial bid must be sealed in separate envelopes super-scribing "**Technical Bid**" and "**Financial Bid**" and both these two envelopes must be placed in a third envelope super-scribing "**Tender for Supplying of Machines and Equipment's for Workshop**". This third envelope should be **sealed (glued along with tapped). Stapled or open tender will be forfeited.** It should be delivered to: "The Director / Chief Innovation Officer, National Innovation Foundation - India, Grambharti, Amrapur, Gandhinagar - Mahudi Road, Gandhinagar - 382650." Latest by 10.30 AM on 22nd November, 2018.

The technical bids will be opened on 22th November 2018 at 11:00 AM, at address given above. The financial bids of successful bidders will be opened on 26th November 2018 at 2:00 PM at NIF Grambharti office. The terms and conditions are as follows:

Any queries related to this tender may be addressed only through email to pc@nifindia.org.

Terms & Conditions:

1. The tenderer/bidder may be a proprietary firm, Partnership firm, Limited Company, Corporate body legally constituted engaged in manufacturing /marketing of production machines /equipment's (copy of registration of firm to be attached).
2. The Bidder must have a **minimum financial annual turnover** of Rs. 50 lakhs in each of past 3 financial years and no loss in P&L account shall be there in those years. Audited Financial documents of balance sheets & P&L account certified by CA shall be provided by bidder.
3. Applicant should not have been blacklisted by the Depts./Ministries of the Govt. of India/State Govt. /PSUs (**A declaration has to be submitted**).
4. Interested bidders who wish to participate in the tender shall pay Rs. 500/ (Rupees Five hundred only) as Tender Fee in the form of Demand Draft (valid for 90 days) drawn in favour of '**National Innovation Foundation-India**' payable at Ahmedabad from any Nationalized /Scheduled bank.
5. The bidder shall furnish, as part of the bid, an interest free EARNEST MONEY DEPOSIT (EMD) of amount mentioned in annexure 2 for each machine /equipment separately in the form of Demand draft (valid for 90 days) drawn in favour of '**National Innovation Foundation-India**' payable at Ahmedabad from any Nationalized /scheduled bank.
6. Tender Fees and Earnest Money Deposit (EMD) in the form of Demand Draft only shall be placed in a sealed Envelope 1 super scribed as "Tender Fees and Earnest Money" with name of machine (s).

7. The tenderer /bidder should submit duly filled check list of technical bid (annexure 1) along with supporting documents and catalogues of machines quoted in the envelope of technical bid.
8. The technical and financial bids should be quoted separately in different sealed envelopes for each machine. Both envelopes must be kept in an envelope which should be superscripted as "Tender for supply of (Name of machine)".
9. One supplier may quote for more than one machine/software but he should submit technical and financial bids and the EMD separately for each machine/software. All the sealed envelopes may be submitted in a single envelope with the tender fee (Rs 500/- per bidder).
10. Sealed Bid may be submitted to the address given above.
11. A copy of the authorization letter/power of attorney/board resolution for the purposes of signing and submitting the present tender documents shall be attached with the tender documents.
12. The Bidder's name stated on the proposal shall be the exact legal name of the firm.
13. Erasures or other changes in the Bid Documents shall be initialled by the person signing the Bid.
14. NIF shall open the bids Technical and Financial bids on the scheduled dates of which the Bidder shall take note and the Bidder, either himself or through an authorized representative shall remain present at such opening. In the event any authorised representative of a Bidder is sent to such opening then such person shall be required to carry an authorization letter for the same.
15. It is hereby clarified that the absence of any Bidder or his authorized representative at such opening shall not affect the legality of such opening and NIF shall be entitled to continue with such opening of bids even in the absence of the Bidders or any of them, and no claim or objection on this ground shall be entertained.
16. Any Tender without EMD and Tender fee will be treated as non-responsive and shall be rejected at the outset itself.
17. The EMD of the unsuccessful bidders will be discharged/returned at the earliest after completion of the tender process. The successful bidder's EMD will be discharged upon the bidder's acceptance of the Letter of Intent/purchase order satisfactorily. The EMD may be forfeited:
 - a. If the bidder withdraws his/her bid during the period of bid validity specified by the bidder in the Bid form;
 - b. In the case of successful bidder, if the bidder fails to sign the contract or fails; or Fails or refuses to honour his/her own quoted price for any of the items or part thereof.
 - c. In both the above cases bidder will not be eligible to participate in the tender for one year from the date of issue of Letter of intent.
18. The financial bids of those bidders will be considered who qualify under technical bid. The financial bids of successful bidders will be opened on 26th November 2018 at 2:00 PM, at address given above.
19. The prices quoted must be inclusive of all taxes, cost of software, training /machine demonstration, loading & unloading, transport insurance

- (wherever applicable) and transportation charges to deliver the equipment/machine at address given above. The applicable rates of GST and amount should be clearly mentioned in the financial bids.
20. The list of machines and softwares is given in Annexure 2, and detailed specification of machines is mentioned in annexure 3.
 21. Submitted quotations should be valid for at least 90 days.
 22. The vendor should supply machines within 45 days of placing the purchase order.
 23. Vendor has to set up and demonstrate and extend adequate hands on training of the machine/equipment/software, without doing that, the delivery would not be deemed to be complete.
 24. Brand new well functional machines with finest finishing must be supplied, the delivery of machines not fulfilling the same, shall not be accepted.
 25. In case the quotation is being submitted by authorized agent of the principal manufacturing company, the authorised sales agency ship certificate from the principal should be furnished along with the quotation. Quotations without this authorization certificate will be rejected.
 26. The cost/bid should include comprehensive warranty for at least 2 years and one year free service.
 27. The cost should include cost of softwares/programmes needed to make the machine/equipment fully functional. In case third party software has to be used, the licence of software in the name of National Innovation Foundation (NIF) must be provided with validity not less than three years.
 28. Special discount/rebate wherever admissible keeping in view that items are being procured for educational purpose in respect of Public Institution of national importance may please be indicated.
 29. Vendors should attach the relevant brochure/leaflet for the models/options quoted.
 30. Vendors should attach users list with their contact details including address, email id and phone number.
 31. Necessary certificate should be enclosed by the vendor in case of proprietary nature of the quoted items.
 32. Incomplete and conditional submitted tenders would be summarily rejected.
 33. Late/delayed tenders received at the venue mentioned above due to any reason, whatsoever, will not be accepted under any circumstances.
 34. The Bidder shall bear all costs associated with the preparation and submission of its Bid. NIF shall, in no case, be responsible or liable for these costs, regardless of the conduct or the outcome of the Bidding process.
 35. The tenderer should sign (not initials) at each page of the technical and financial bid documents and all its annexures. No page should be removed/detached from the tender document.
 36. In case two or more agencies are found to have quoted the same rates, the competent authority, NIF shall decide about the agency to which the offer shall be granted based on the past credentials/ report on the past performance of the firm, and length of experience etc. The decision of the competent authority, NIF shall be final and binding, and no communication in this regard will be entertained.

37. Payment of 80% will be released after delivery of machines/ equipment in good condition, successful commissioning, installation, testing of machines or equipment.
38. Remaining 20% payment will be released after satisfying all the conditions as per the tender terms and condition, satisfactory functioning of the machines/equipment supplied and after furnishing of Guarantee/ Warranty documents and performance security.
39. The successful bidder needs to submit performance security (5% of the final price /contract value of the machine) in the form of Bank guarantee from a Nationalized/Scheduled bank which should be valid for a period of 90 days beyond the completion of all contractual obligations of the supplier including warranty period.
40. The Performance security shall be forfeited and credited to the Institute in the event of breach of contractual obligation by the supplier, in terms of relevant contract.
41. NIF reserve the rights to cancel the tender process, without giving any reasons.
42. The conflicts or disputes that may arise in relation to the subject, content, interpretation, implementation and enforcement of this agreement will be solved, firstly, by the Monitoring Committee setup jointly for good governance and then, by equity arbitration. In the event, efforts by Monitoring Committee and an equity arbitration attempt fails, then the legal jurisdiction to be approached shall be within the jurisdictions of Ahmedabad/Gandhinagar only.

Annexure 1**Format for technical bid of the tender (NIF/2018/ADM/009)**

Tender submitted for supply of(name of machine /equipment/software)

Sl. No.	Description of requirement	Enclosed	Enclosure No.
1.	Whether the firm is registered with proprietary firm, Partnership firm, Limited Company, Corporate body legally constituted engaged in manufacturing / marketing of production machines / equipment	Yes/No	
2.	Declaration by the bidder that he /she has not been blacklisted by the Department /Ministries of the Govt. of India/State Govt./PSUs	Yes/No	
3.	Copies of Balance Sheet and Income Tax Return for last 3 years duly certified by CA	Yes/No	
4.	Copy of Registration Certificate of the firm	Yes/No	
5.	Copy of PAN/TAN/GST issued by Income Tax Dept.	Yes/No	
6.	Partnership deed, if applicable	Yes/No	
7.	Details of other organizations where similar machines/software's have been supplied (copy of work orders to be attached)	Yes/No	
8.	Demand draft of Rs...../-as tender fee enclosed in separate envelope along with Technical Bid	Yes/No	
9.	Demand draft of Rs...../-as EMD enclosed in separate envelope along with Technical Bid	Yes/No	
10.	Technical specification of the machine/software	Yes/No	
11.	Financial Bid proforma/quotation completed and sealed in a separate envelope	Yes/No	

Declaration of the Tenderer:-

This is to certify that I/We before signing this tender have read and fully understood all the terms and conditions contained herein and undertake myself/ourselves to abide by them.

(Signature of Tenderer with seal) Name:

Place:

Seal :

Date:

Office Address:

A) List of machines

S No	Machine name	No. of units	Estimated price, Rs	EMD, Rs
1.	Plant for powder coating	1	25,00,000	50,000
2.	Plant for electroless nickel and nickel -chromium plating	1	25,00,000	50,000
3.	CNC Router	1	8,00,000	16,000
4.	PCB engraver	1	2,50,000	5,000
5.	Injection moulding machine (120 ton)	1	15,00,000	30,000
6.	Injection moulding machine (300 ton)	1	25,00,000	50,000
7.	3D Scanner	1	10,00,000	20,000
8.	Semi-automatic tube bending machine	1	2,50,000	5,000
9.	Arm type - electric tapping machine	1	2,00,000	4,000
10.	Submerged arc welding	1	3,00,000	6,000
11.	Laser welding	1	1,50,000	3,000
12.	Horizontal machining center with automatic tool changer	1	1,00,00,000	2,00,000
13.	CNC Abrasive waterjet cutting machine	1	75,00,000	1,50,000
14.	Metal engraver	1	5,00,000	10,000
15.	Gear hobbing machine	1	6,00,000	12,000
16.	High speed all geared lathe	1	12,00,000	24,000
17.	Heavy duty shaping machine	1	4,00,000	8,000
18.	Lab view software alongwith hardware	1	4,00,000	8,000

B) List of softwares

S No	Name of software	No. of copies	Estimated value, Rs	EMD, Rs
1.	Master CAM : Latest version with 3 axis milling solutions, wire EDM solutions and router solutions which can be operate with post processors like Fanuc, Siemens, HAAS, Heidenhain etc. (Subscription period not less than three years without renewal fee)	1	5,00,000	10,000
2.	Solidworks : Professional 2018 (Subscription period not less than three years without renewal fee)	1	5,00,000	10,000
3.	Solid works : Standard 2018 (Subscription period not less than three years without renewal fee)	1	4,00,000	8,000

Details of machines along with specifications**1) PLANT FOR POWDER COATING**

Particulars	Specification
Technology	Plant for powder coating, suitable for Mild Steel/ Stainless Steel, Aluminum, Zinc alloys, Cast iron, etc. The plant should include all sub systems / equipment / accessories required for fulfilling the job, desired specification of major subsystems is given below
Pre- Treatment Plant	Dip chemical treatment, Iron exchange based DM water treatment plant, Degreasing Plant chemical container sized- suitability fit according to max work sized to be coated
Max work size to be coated	Length -1500 mm Width - 500 mm Height -1200 mm
Load carrying Capacity	20 -50 kg
No of hangers	Minimum 8
Conveyor type	Overhead conveyor - (I-Beam conveyors)
Conveyor pitch length	Minimum 800 mm
Conveyor drive	Variable speed power motor
Powder spraying guns	Automatic guns on reciprocators
Powder coating booth	according to maximum size to be coated (as mentioned above)
Curing oven Size	Tunnel Type Curing Oven, Electric Heaters With Air Circulation (According Max Sized to be Coated)
Control Panel	Supervisory Controls And Data Acquisition based control Panels (SCADA) Based Control Panel
Accessories	All standard accessories, electrical and electronic systems, Required number of gas cylinders, gas pipes of required length, regulators, manifold, pressure gauges and other necessary accessories needed to perform the powder coating of job size given above to be provided by the supplier. The specification of the manor accessories needs to be mentioned in the technical bid clearly.

2) PLANT FOR ELECTROLESS NICKEL AND NICKEL -CHROMIUM PLATING

Particulars	Specification
Technology	Plant for electro less nickel / nickel chrome plating / coating, suitable for coating on parts of various sizes.
Capacity of tank	Suitable size of tank to take care of jobs of various sizes upto 1500 mm in length, 500 mm width and 1000 mm height
Plating thickness required	Minimum 10 micron
Material of parts to be coated	Aluminum, Mild Steels, Hardened Steels, Stainless Steels, etc.
Finishing	Over the significant surface, there shall be no clearly visible plating defects such as blisters, pits, roughness, cracks, unplated areas, stains or discoloration.
Accessories	The plant should include all sub systems / equipment / accessories required for fulfilling the job. The bidder should quote the price including cost of all essential accessories to make the plant fully functional

3) CNC ROUTER

Particulars	Specification
Working Area (X, Y, Z)	1300 x 2500 x 200 mm
Suitable for materials	Suitable for sheet processing, cutting, slotting, engraving, etc. Suitable for working in material like wood, foam sheet, acrylic sheet, plastic, PVC, plywood, medium density fibreboard (MDF), and aluminium composite material (ACM).
Spindle	6 kW Air Cooled (Italian make)
Spindle Speed	18000 RPM
Traveling Speed	25 m/ min
Cutting Tool Diameter	Ø3 to 20 mm
Table Structure	Heavy duty rigid mild steel frame structure
Operating System	High Speed PIC based Controller
Driving System	AC Servo Motor (Mitsubishi/YASAKWA (Reputed JAPAN Make)
Power Supply	AC 440V/3 Phase
Distance Between Bed and Gentry	200 mm
Interface	USB, Ethernet
Repeatability	0.020 (+/-mm)
Bed System	Vacuum and clamp based system
Command	CAD/CAM Software with G Code
Software	Licenced version (having at least 5 years permission to free use)
Accessories	The bidder should quote the price including cost of all essential accessories, tools, bits, tool kit, softwares, etc to make the machine fully functional with rotary attachment on bed.

4) PCB ENGRAVER

Particulars	Specification
Minimum table size	350 x 200 mm
Travel in Z Axis	Upto 40 mm
Spindle Speed	Upto 20,000 RPM
Spindle Speed Control	Manual
Feed Rate	Upto 5000 mm/ min
Contouring Feed Rate	Upto 1000 mm/ min
Spindle Motor	100 Watts
Axes Motors	Stepper
Power requirement	Preferably single phase electricity
Command	CAD/CAM Software with G Code, GRBL FILES
Minimum Accuracy	100 Micron

5) INJECTION MOULDING MACHINE (120 Ton)

Particulars	Specification
Technology	Horizontal, fully automatic screw type double cylinder injection moulding machine
Target material	Thermosetting resins including Acrylonitrile-Butadiene-Styrene (ABS), Nylon PA, Polycarbonate PC, Polypropylene (PP), Polystyrene GPPS, etc.
Drive	Servo motor driven
Controller	PLC - Mirle (Lubi)/ Streamline
Feeding type	Horizontal
Shot weight	20 - 250 g

Screw diameter	Between 40 and 42 mm
L/D Ratio	20:1
Screw speed	200 rpm
Heating capacity	More than 9 kW W
Mold height	150-450 mm
Ejector stroke	140 mm
Ejector tonnage	50
Hydraulic pump	Servo motor (Lubi/KEB/Gefran)
No. of ejector	9
Ejector force	70 ton
Point toggle	Five
Screw Barrel	Colour mix with gas nitriding
Sensors	Oil temperature sensor, Screw RPM sensor
Hand safety	PLC alarm, hydraulic dump valve, electric switch
Motorized mold setting	Automatic
Lubrication	Auto with PLC controlled
Accessories	All standard accessories including Hopper dryer, vacuum loader, FRP water cooler, suitable size water pump set of standard make, PLC, power supply, etc. required for making machine functional to be included The machine should have provision of adjustment of injection volume according to job size.

6) INJECTION MOULDING MACHINE (300 Ton)

Particulars	Specification
Technology	Horizontal, fully automatic screw type double cylinder injection moulding machine
Target material	Thermosetting resins including Acrylonitrile-Butadiene-Styrene (ABS), Nylon PA, Polycarbonate PC, Polypropylene (PP), Polystyrene GPPS, etc.
Drive	Servo motor driven
Controller	PLC - Mirle (Lubi)/ Streamline or equivalent make
Feeding type	Horizontal
Shot weight	200-800 g
Screw diameter	60 mm
L/D Ratio	22:1
Screw speed	220 rpm
Heating capacity	More than 25 kW
Mold height	200-600 mm
Ejector stroke	150 mm
No. of ejector	9
Ejector force	70 ton
Hydraulic pump	Servo motor (Lubi/KEB/Gefran)
Point toggle	Five
Screw Barrel	Colour mix with gas nitriding
Sensor	Oil temperature sensor, Screw RPM sensor
Hand safety	PLC alarm, hydraulic dump valve, electric switch
Motorized mold setting	Automatic
Lubrication	Auto with PLC controlled
Accessories	All standard accessories including Hopper dryer, vacuum loader, FRP water cooler, 1.5 HP water pump set, PLC, power supply, etc required for making machine functional to be included The machine should have provision of adjustment of injection volume according to job size.

7) 3D SCANNER

Particulars	Specification
Range	0.5 - 3.0 m
Resolution @ 0.5m	Lateral: 0.2mm - 1mm Depth: 0.2 mm
3D point Accuracy/ whole scan accuracy	< 1.5mm
Typical lateral accuracy	< 1mm
Single image point density	Up to 45,000 points/ m2 in 0.5m distance Up to 10,000 points/ m2 in 1m distance
Recorded 3d Points	Up to 80,000 points/ s,
Typical noise (rms)	0.7mm @ 0,5m distance 0.75mm @ 1m distance 2.5mm @ 2m distance 5mm @ 3m distance
Eye safety	Class 1 laser
Lightening conditions	Upto 10,000 Lux
Light source	In built LED flash
Scan volume	Around 8 m3
Exposure time	0.02ms - 10ms (auto exposure)
Texture colour	24 bit
Connectivity	USB 3.0
Calibration	Optional in-field user calibration with supplied calibration plate
Operating temperature range	Upto 40 degree Celsius
Operating humidity range	Non-condensing
Software	Licenced version software required to generate mesh, do registration and convert the output into .step, .igs, .stl format ; to be included by the vendor (having at least 5 years permission to free use).

8) SEMI-AUTOMATIC TUBE BENDING MACHINE

Particulars	Specification
Tube outer diameter (mm)	16-42 mm
Round bar (mm)	Upto 22 mm
Square bar (mm)	Upto 32x32 mm
Rectangular tube (mm)	60x30 mm
Bend centre line radius	2D
Bending degree	180
bending speed	3 rpm
Bending accuracy	0.2
Tube feeding	Manual
Power	3 H.P.
Thickness range	1 - 3 mm
Bending direction	Clockwise and anti-clockwise
Accessories	All standard accessories including belt / pulley for power transmission, electric switch / starter, electric motor (3 hp, 3 phase), etc required for making machine functional to be included
Others	Machine should be suitable for materials including MS, Aluminum, SS , GI, Brass, etc. Structure should be made up of non-corrosive material with finest finishing.

9) ARM TYPE - ELECTRIC TAPPING MACHINE

Particulars	Specification
Capacity (mm)	M6-M32
Working Radius (mm)	2000 mm
Chuck size (mm)	48
Motor type	Servo
Power (kW)	1.5
Speed (rpm)	0 - 200
Depth adjustment	Automatic
Accessories	Machine should be compiled with required accessories to make it fully functional
Others	Suitable for materials including high grade steels. Structure should be made up of non-corrosive material with finest finishing.

10) SUBMERGED ARC WELDING

Particulars	Specification
Input voltage (V)	AC 415 \pm 15%
Frequency, Hz	50/60
Rated input current (A)	90
Power (kVA)	64.5
No-load voltage (V)	80
Output current range	112 - 1250
Rated output voltage (V)	44
Duty cycle%	60
No-load loss (W)	300
Efficiency %	85
Power factor	0.93
Arc force current range (A)	0-100
Accessories	Machine should be compiled with required accessories to make it fully functional
Others	Structure should be made up of non-corrosive material with finest finishing.

11) LASER WELDING

Particulars	Specification
Average laser power	400 W
Max laser power	440 W
Max energy of single pulse	90 J
Laser wavelength	1064nm
Pulse width	0.3 - 20 ms
Laser welding frequency,	0.5 - 100 hz
Spot size range	0.2 - 2 mm
Welding wire	0.1 - 0.5 mm
Power supply	220 VAC \pm 10% / 50-60 Hz
Power consumption	10 kW
Water pressure protection	0.025 MPa
Cooling water temperature	35 degrees
Temperature protection	45 degrees
Cooling water flow	10 L/min
Dimension cu.mm	1000 x 600 x 1500
Cooling way	Water
Laser type	Pulse
Accessories	Machine should be compiled with required accessories to make it fully functional
Others	Structure should be made up of non-corrosive material with finest finishing.

12) HORIZONTAL MACHINING CENTER WITH AUTOMATIC TOOL CHANGER

Particulars	Specification
Working strokes	
Longitudinal traverse(X)	≥ 800 mm
Vertical traverse(Y)	≥ 550 mm
Transverse traverse(Z)	≥ 550 mm
Working Table -Rotary	
Table clamping surface	≥ 500mmX600 mm
Work piece size (dia x height)	≥ 700mmx750 mm
Speed of rotary table for cutting and rapid	≥ 20 RPM
Safe working load on table	≥ 500 kg
Least angular movement of table rotation (B-axis)	≤ 0.001degree
Machine accuracies	All accuracies should be in accordance to VDI /DGQ 3441
Positional uncertainty/ deviation for all linear axes (Pa)	≤ 0.010mm
Repeatability for all linear axes (Ps max)	≤ 0.007mm
Spindle run out	≤ 0.010mm at spindle taper nose and 0.020 (using mandrel) at 300mm from spindle face.
Accuracy of angular movement of table rotation (B-axis)	≤ ± 20 Arc seconds
Working accuracy should be as per NAS-979 standard work piece machining test	
Geometrical alignment check as per supplier's test chart confirming to relevant ISO/IS test code	
Feed drive- AC servo drive with re-circulating ball screw for all linear axes	
Cutting feed rate	≥ 10 m/min
Rap Rapid feed rate	≥ 30 m/min
Spindle (coolant through spindle type)	
Tool mounting	HSK 63 A/SK-40/BT-40 or suitable technically justified choice, suitable for spindle RPM-10000 or more
Spindle Speed	≥ 10000 RPM
Spindle power-30min/100% duty cycle	≥ 15/11 kW
Feedback system	
Feedback elements for linear axes	Linear scales / rotary encoder measuring system

Automatic Tool Changer (ATC)	
Capacity of ATC magazine	≥ 20 tools
Rigid tapping facility with suitable feedback system	
Air blast for spindle taper cleaning.	
CNC control system	
Siemens-Sinumerik 828D-M (Version 261.2) - 4/4 axes CNC control system, Ethernet feature/ USB /flash card ports enabled, with all standard features or their latest applicable version with suitable technically justified standard features. Experience/expertise in operation and maintenance with this control system exists with machine shop	
Machine control system shall be capable of simultaneous interpolation of X, Y, Z, & B axes.	
Accessories to make machine operational needs to be supplied by the bidder including Automatic centralized lubrication system-5 litre or more capacity of reputed make such as Cenlub system, Oil skimmer-belt type, Visiport window on operator side, Built in AC for feed drives of all axes and electrical cabinet, Full door with sliding door interlock, machine light (set of minimum 2 nos. of lights), Chip conveyor- inside machine -coil type and rear side of machine -slat-cum- scrapper type conveyor with chip bin, Coolant mist collector/fume extractor unit - suitable for water based coolant, Coolant system for coolant supply including pump. (bidder has to mention flow rate & tank capacity), Hand held manual pulse generator for all axes., voltage stabilizer & Isolation transformer suitable for machine-preferably console/ Servomax make, tools and clamps of basic cutting operation, etc.	
Others: The machine design and construction shall be based on modern machine tool design and manufacturing practices. Spindle head shall be balanced with hydraulic counter balancing system/ electronic balancing system. The balancing shall be as per modern machine building practices. Guide ways for all linear axes shall be of linear motion, roller type or suitable technically justified choice. The damping features of machine bed shall be compatible with finish and repeatability requirements. Direct individual drive for all axes or suitable technically justified choice. The machine shall have precision ball screws for all linear axes or suitable technically justified choice. Spindle should be life time lubricated or oil cooled with oil chillier facility. In case of low lubrication, an alarm message shall be displayed on the controller screen and the machine shall stop automatically after completion of the cycle. Machine shall be equipped with straight line stainless steel telescopic covers for longitudinal guide ways and ball screws or suitable technically justified choice. For vertical guide ways deflectors/ vertical telescopic covers shall be provided. Machine shall have full-protection cabin including roof with sliding doors, large safety glass windows, optimum accessibility for operator and maintenance staff & crane loading possible. Low wear laminated glass should be provided as safety glass panes or suitable technically justified choice.	

13) CNC ABRASIVE WATERJET CUTTING MACHINE

Particulars		Specification
Type of structure		Rigid Cantilever structure with integrated tank
Travel of Axis:	X	1600 mm
	Y	3100 mm
	Z	250 mm
Accuracy of XY travel as per VDI3441 (Pa)		± 0.05 mm/m
Repeatability as per VDI3441 (Ps)		± 0.05 mm
Rapid Travel Speed		Up to 50 m/min
High Pressure Pump		50 hp, German Make (intensifier type) with dual pressure high & low
Control of all 3 Axis		AC servo motors and Drives from (Schneider / Yasakawa)
CNC control system		Industrial PC based, German make - Power automation
Linear motion components		Gambini / Rexroth / THK or any other reputed standard make
NC Software included		Most2D / Lantek / SigmaNEST
Operating Panel		19" LCD monitor with wireless keyboard
Control Panel		Integrated with the machine body
Power Supply for Table		10KW, 15A, 3 phase, 440V AC, 50Hz
Lubrication (Oil)		Centralized lubrication system with metering cartridges and line failure sensor
Initial Height Sensor		Pneumatic Type
Edge Finder		Laser Type
Submerge Cutting Function		Automatic water level up-down system
Abrasive metering & feeding		Servo controlled (Schneider / Yaskawa) metering & Auto feeding
Accessories:		The supplied should include all standard accessories to make machine fully function, including RO Water Plant, Air compressor, Grundfos Pressure Pump with tank, Water Chiller 5tr with 500Ltr Tank for cooling pump, Controlled Voltage Stabiliser 50 KVA, Hydraulic servo motor oil system: 210 lit, etc matching the requirement of machine. Specifications of all accessories (including make, model, size, etc) to be mentioned in technology bid separately.

Others	Water Bricks should be included required for cutting glass, brittle materials and small pieces. Structure should be made up of non-corrosive standard materials with finest finishing.
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14) METAL ENGRAVER

Particulars	Specifications
Machining Area	300 x 300 mm
Spindle :	2.2 kW (Water Cooled)
Spindle RPM	18000
Z Max. Travelling	100 mm
Distance Between Bed and Gentry	100 mm
Cutting Tools Diameter, mm	Ø3, Ø4, Ø6, Ø8
Repeated Location	0.005 mm
Max. Running Speed	7 m/min
Power Supply	AC 230V/50Hz
PLC	DSP remote type
Input data format	G code
Inbuilt memory	256 MB
Suitable for	Suitable for materials including MS, Aluminium, Copper, Brass, etc
Accessories	Machine should be compiled with required accessories to make it fully functional. Specifications of all accessories (including make, model, size, etc.) to be mentioned in technical bid separately
Others	Structure should be made up of non-corrosive material with finest finishing.

15) GEAR HOBBING MACHINE

Particulars	Specifications
Module	6 mm
Maximum Diameter of Gear with support	600 mm
Minimum Diameter of Gear	10 mm
Minimum number of Teeth	6
Maximum Helical Gear cutting	45 Deg
Diameter of Work table	More than 500 mm
Maximum Diameter of Hob	110mm
Hob Arbour	31.75 mm
Main Drive Motor	3 hp
Rapid motor	1.5 hp
Coolant Pump	From reputed brand
Suitability	Machine should make precision Spur, Helical Worm Gears, Splines, Sprockets, Ratchet Wheels & any other form that can be hobbled. Suitable for material including MS, SS, etc
Accessories	All standard accessories including belt / pulley for power transmission, electric switch / starter, electric motors, etc required for making machine functional to be included
Others	Machine should be suitable for materials including MS, Aluminum, SS , GI, Brass, etc. Structure should be made up of non-corrosive material with finest finishing.

16) HIGH SPEED ALL GEARED LATHE

Particulars	Specification
Swing Over bed	800 mm
Swing Over Cross slide	570 mm
Swing in Gap Diameter	1035 mm
Distance Between Centers	3000 mm
Valid Length of Gap	250 mm
Width of bed	400 mm
Spindle nose	D1-8
Spindle bore	105 mm
Taper of Spindle bore	Ø113 (1:20)
Range of spindle speed	25-1600 rpm
Compound rest travel	230 mm
Cross slide travel	420 mm
Max. section of tool	25 x 25mm
Lead screw thread	12 mm
Longitudinal feeds range	0.044-1.48 mm/rev
Cross feeds rang	0.022-0.74 mm/rev
Threads metric pitches 54 kinds	0.45-120 mm
Threads imperial pitches	54 kinds 7/16-80 T.P.I
Threads diametral pitches	42 kinds 7/8-160 D.P
Threads module pitches	46 kinds 0.25-60 M.P
Quill diameter	90 mm(
Quill travel	235mm
Quill taper	No.5 Morse
Main motor power	7.5kW(10 HP) 3 PH
Coolant pump power	0.1kW(1/8HP) 3PH
Accessories	The supplier needs to supply all the standard accessories including Foot Brake,, Coolant System, Machine Lamp, Centre, Centre Sleeve, Oil Gun, Driving Plate, 315mm x 3 Jaw Self-Centering Chuck, 400mm x 4 - Jaw Independent Chuck, Steady Rest (20-190mm), Follow Rest (20-130mm), Face Plate 450mm dia, Toolbox Foot Stand, Chasing Dial, etc. Specifications of all accessories (including make, model, size, etc) to be mentioned in technology bid separately
Others	Structure should be made up of heavy duty material with finest finishing. Adequate training should be provided

17) HEAVY DUTY SHAPING MACHINE

Particulars	Specification
Length of Ram stroke	762 mm (30 inch)
Motor power	5 hp
Drive	All geared
Lubrication	Automatic oil lubrication pump
Length of RAM	1410 mm
Table of RAM	510 x75 mm
Working surface of table	762 x 390 mm
Max. table travel horizontal	787 mm
Max. table travel vertical	450 mm
Angular movement of table	600L-600R
Max. vertical travel of tool slide	203 mm
Max. Swivel of tool head	600L-600R
No. of ram speeds	4
Stroke per min	8,16,32,48
Stroke of ram	0.229
Accessories	The accessories including but not limited to Automatic tool lifting attachment, Automatic down feed to tool slide, motors, electric switches, etc. needed to make machine fully functional needs to be included. The technical specification (make model) of the accessories to be mentioned in the technical bid.
Other	Structure should be made of heavy duty standard material with finest finishing.

18) LABVIEW SOFTWARE WITH HARDWARE

Particulars	Specification
Software	LabVIEW Full Development System, English, Including Standard Service Package for Software (Min 1 year) Latest Version/Full Package.
Hardware	<ul style="list-style-type: none"> • Compact Data Acquisition Systems. • Modules (Including Standard Repair Coverage) • Eight channel AI Voltage Measurement module with screw terminals, 16 channel AI current measurement module with spring terminal, DI Module 6 channel, (5 to 24 V, 1 MHz), Digital Module for Input/output 4 channel LVTTTL, 15 pin female to Male DSUB Input/output Cable of length 1 metre. Back shell for 36 pos Spring Terminal Connector, Strain Relief and Operator Protection. • Chassis (Including Standard Repair Coverage) • USB Connectivity 4 slot DAQ Chassis, USB Connectivity 1 slot DAQ Chassis, Wifi Connectivity 1 slot 802.11G standard compatible chassis. • System Accessories: AC Power Cord for Compact DAQ Chassis, 120 VAC with length 2 to 2.5 meters, etc.
Other accessories	Any other standard accessory needed to use the software and hardware needs to be included by the vendor. The technical specifications of all the accessories (with make, model, etc) to be clearly mentioned in the technical bid.