



INDIAN INSTITUTE OF TECHNOLOGY BOMBAY

MATERIALS MANAGEMENT DIVISION

Powai, Mumbai 400076.

Ref. PR No. 1000054879

Rfx No. 6100003069

Technical Specification : CNC Water Jet Cutting System

S.No.	Parameters	Technical Specification	Compliance (Yes/No)	Additional Information
1. CNC Water Jet Cutting System				
1.1	Applications	Cutting of metals (stainless steel, alloy steel, non-ferrous metals), fiber reinforced composite materials (including carbon, glass, aramid and other fiber based FRPs), elastomers, granite, and glass.		
1.2	Cutting Area Dimensions	A.Cutting Area		
		i. Abrasive Water Jet: Minimum 1500 mm x 1500		
		B. Axis Travel		
		i. X-Axis: Minimum 1500 mm		
		ii. Y-Axis: Minimum 1500 mm		
		iii. Z-Axis: Minimum 250 mm		
1.3	Cutting Thickness:	Capable of cutting stainless steel for upto 100 mm thick.		
1.4	Accuracy	i. Positioning Accuracy: $\pm 0.02\text{mm}$ per entire working stroke of X (1500mm) and Y (1500mm) axis		
		ii. Repeatability: $\pm 0.02\text{mm}$ per entire working stroke of x (1500mm) and y(1500mm) axis		
		iii. Squareness : $\pm 0.1\text{ mm}$ per meter or better		
		iv. Straightness : $\pm 0.1\text{ mm}$ per meter or better		

1.5	Maximum Axis Speed	i. X-Y Axis: 25,000 mm/min		
		ii. Z-Axis: 5,000 mm/min		
1.6	Cantilever and Motion System	A. Cantilever Structure: Rigid Cantilever Structure having 3 side open working envelop for material loading with synchronized servo motors and closed-loop control.		
		B. Motion Transmission:		
		i. X & Y Axes: High-speed helical rack & pinion system		
		ii. Z Axis: Precision ball screw.		
1.7	High-Pressure Pump Specifications	Pump Type - Intensifier Type.		
		Max Pressure: Capable of continuous pressure over 4000 bar (60,000psi).		
		Flow Rate: more than 3.5 LPM or higher at maximum pressure.		
		Power: Minimum 50 HP, 3-phase, 415V.		
		Intermediate/Booster Pump: As per HP pump requirements,		
1.8	Cutting Head and Catcher Tank	A. Cutting Head		
		i. Type: Abrasive Water Jet cutting heads.		
		ii. Features: Precision alignment for orifice and focusing nozzle, automatic standoff, and head lift during traversing.		
		B. Catcher Tank		
		i. Material: Mild Steel		
		ii. Grid Capacity: Supports a load of 1000 kg/sq.		
1.9	Controller Specifications	Type: CNC Controller Required Make: Reputed CNC providers prefer Power Automation/Double CNC		
		Display: at least 24 Inch Graphical color display.		
		Memory: Minimum 120 GB memory, with USB backup option.		
		Software Compatibility: CAD/CAM support for DXF/DWG file formats with automatic tool path		
		G & M Code: Capability of running ISO G & M codes, which should be editable by the user end.		

1.10	Drives & Motors and Lubrication	AC servo motors and drives from international reputed brand to be provided.		
		Centralized Automatic Lubrication System with metering cartridges and should have warning or alarm if any failure in line.		
		Essential safety accessories for operating the machine such as bellows should be provided on all motion components of machine.		
1.11	Abrasive Delivery System	Feeder Capacity: Minimum 200 Liters (bulk abrasive delivery system should be part of unit).		
1.12	Consumables and Accessories	Consumables: to be supplied with the machine, i. Nozzles: 2 Nos ii. Abrasive Garnet - 1000 Kgs.		
1.13	Safety Features	Certifications: Machine and equipment in accordance with the CE safety standards or substantially equivalent. Interlocks: Safety interlocks to prevent operator injury or machine damage. Monitoring: Continuous machine diagnostics and alarms.		
1.14	Utilities and Installation Requirements	A. Utilities: All necessary utilities and auxiliary equipment required to run/operate the AWJCS must be supplied with AWJCS as part of this		
		B. Air Compressor: Minimum 3 HP or higher rated unit, meeting the all the air requirements of AWJCS		
		C. Servo Stabilizer: Input 360-460 V, Output 415 V, 50 Hz, capable for continuous operations of AWJCS		
		D. RO Water Treatment Plant: Minimum capacity 250 Upr. with 500-liter storage meeting all the requirements of input water fed to AWJCS		
		E. Chiller: Min. 5 TR or higher as per the requirement of the specified AWJCS.		
1.14		F. Booster pump as per the input specifications of AWJCS.		
		G. Tank for raw water supply to be included with the machine. Min. 500L storage capacity.		

		H. Separate tank for storing RO-filtered water, before feeding to high pressure pump Min. 500L storage capacity.		
1.15	Training and Commissioning	On-site installation and commissioning by experienced engineers at customer site.		
		Training for operation and maintenance at site in detail.		
1.16	Documentation and Manuals	Vendor should supply hardcopy and softcopy of following documents with machine		
		a) Operating Manual of Machine		
		b) High Pressure Pump Manual		
		c) Ancillaries Manual		
		d) Electrical Diagram and Drawing of machine		
1.17	Power and Water Arrangements	Institute will provide Power and Water supply up to machine inlet point. Vendor to share GA drawing along with water and Power requirements of each ancillary to arrange at site.		
1.18	Warranty	1 year from Installation Date. Warranty Certificate to be signed and stamped and submitted after installation.		
1.19	Delivery Period	The machine should be delivered at site within 4 months from date of acceptance of Purchase		

1.20	20.1 Mandatory Conditions: • The firm must be an OEM OR authorized dealer of the OEM manufacturing this equipment. Authorized dealer must submit the authorization certification from OEM. • The OEM must have completed a minimum of 5 installations of metal Abrasive Water Jet Cutting System in India within the last five years. The bidder should have supplied a minimum of two such machines to other IITs or other centrally funded premier educational institutions.(PO Copy)		
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