Technical Specification of 3D Printing Machine-Metal

S. No.	Parameters	Description/Sizes	Comply/Not Comply
1.	Printing Process/Technology	Atomic Diffusion Additive Manufacturing (ADAM) / Metal fused filament fabrication	
2.	Build Size-(W×D×H):	250 x 175 x 150 mm or more 10kg approx	
3.	Build Plate	Build built plate should be removable Build plate should be clipped to the build platform	
4.	Print System	2 Nozzles – Metal Material and release material	
5.	Print Chamber	Chamber should auto lock during operation	
6.	Calibrations	Calibration of X, Y, Z axis and Nozzle, print head before the start of each job.	
7.	Print Speed	10 – 50 mm/s	
8.	Print head change	Capability to print different materials without changing the print heads/ Nozzles	
9.	Power Requirements	100-240 VAC (20 A peak)	
10.	Metal Materials	Stainless Steel (17-4 PH, 316L), Tool steel (H13,A2,D2) Inconel (IN) 625 Copper	
11.	Release/Build Material	i) Metal material with ceramic release layer ii) Ceramic (Consumed at 1:10 ratio to metal spools)	
12.	Material Handling	Material handling systems should be part of the Printer with material loading, feeding and storage management system. All material spool/cartridges (model and support) should indicate the quantity of material available in the spool / cartridge at any instance of the machine operation during idle or run time. For large jobs. The machine shall automatically pause and prompt the operator to replenish material and resume printing in case of the material (for both model and support) gets consumed during the build process.	

13.	Build material form	Wire form	
14.	Support Material	Metal material with ceramic release layer / The machine should be capable to build parts in all material with Rigid Soluble support filament to be able to print trapped geometries and hidden overhangs and for hands free support removal. The support material should be rigid in nature. The printer should be able to print with the same support material for all the material and should dissolve using the same support removal equipment and solvent/chemical.	
15.	Layer Height	50um or more	
16.	Build Plate Leveling	Pre-calibrated leveling	
17.	Calibrations	Calibration of X, Y, Z axis and Nozzle, print head before the start of each job.	
18.	Noise Emissions (Acoustic)	<50 dB(A) when building	
19.	Operating Ambient Temperature	18-40 degree C, 10-90 % RH non-condensing	
20.	Monitoring	Front side shall be transparent to see the manufacturing process.	
21.	Input Voltage	100-240 V AC	
22.	Over current Rating	20A	
23.	Phase	Single Phase	
24.	Wiring System	3W (L,N,G)	
25.	Wash station	i) Washing time: 12-72 hrs ii) Solvent : As required iii) Working volume: 356x 254x230 mm approx	
26.	Sinter Oven	i) Run time: 17-30 hrs approx ii) Peak internal temp: 1300 °C approx iii) Sinter volume: 18356 cu cm approx	
27.	Software	1. Software supplied must be from the same OEM and should be compatible with Windows 10 or higher version. 2. Software should be able to import any native CAD formats like Stl of CAD packages such as Solidworks, Catia, Creo, Siemens, Inventor etc. 3. Software shall be able to generate different internal customizable build styles (honeycomb to solid) along various regions/segment of	

		the part along the same cross section. Software should also allow user to edit the internal structure of each layer and/or group of layers of the CAD model. 4. Software shall allow user to import assembly CAD files and change interior fill of each component of the assembly individually. 5. Software shall have ability to pre-program pauses on any layer of the generated slice file to add metal inserts,	
28.	Printer Controller	1. User Interface: min 4 inch Touch Screen. 2. Network/Connectivity:Ethernet/ LAN, USB port. 3. Resume Print after Power Outage with UPS backup	
29.	UPS	10 KVA with min 30 min backup.	
30.	Warranty	Comprehensive 2 Years warranty for all components should be offered	
31.	Certification	CB/ CE/ RoHS / IS	
32.	Tool Kit and accessories with Machine if any	Bidder to specify	
33.	Emergency stop	Printer should be equipped with emergency stop operation to stop operation during printing if needed	

Conditions:

1. Machine should be supply with all accessories including all the tools and manual including Installation, Commissioning & Training will be provided to our staff for free of cost at our center.
2. 3, 4 , 5 yr comprehensive AMC is in the scope of vendor
3. Note: ALIMCO to provide Air conditioned chamber to maintain the operating temperature of the printer

Technical Specification of 3D Printing Machine-Plastic-Multijet

S. No.	Parameters	Description/Sizes	Comply
1.	Printing Process/Technology	Ultraviolet light curable material that is Jetted, Non laser baser/Multi jet Fusion printing	
2.	Maximum Build Size-(W×D×H):	280 x 200 x 140 mm or more 10kg approx	
3.	Print Chamber	Chamber should auto lock during operation	
4.	Build Plate	Build built plate should be removable Build plate should be clipped to the build platform	
5.	Print System	1 print head with multiple nozzles support material with auto-material detection.	
6.	Calibrations	Calibration of X, Y, Z axis and Nozzle, print head before the start of each job.	
7.	Print Speed	192 to 300 Cubic cm per hour approx	
8.	Print head change	Capability to print different materials without changing the print heads/ Nozzles	
9.	Power Requirements	100-240 VAC (20 A peak)	
10.	Materials	i) Production Grade Materials with proven Industry performance. ii) The printer should be able to build in engineering grade thermoplastics. The parameters for the default materials such as Nozzle Temperature, Chamber Temperature, and Chamber heat circulations, Extrusion Rates etc. Should be factory programmed into the machine and slicing software and the machine should be able to print any geometry without the user having to tweak/adjust the parameters. iii) Rigid Plastic Materials - White, Black, Translucent & Grey Color. 1. ABS Like material. 2. PP Like material. 3. Elastomeric Material - Natural/Black in color. 4. High Temperature 5. Medical Grade Material	

		iv) Phase Change Material- To deliver droplet control for sharper accurate & Smoother surface	
11.	Media	Liquid/resin based	
12.	Support Material	The machine should be capable to build parts in all material with Rigid Soluble support filament to be able to print trapped geometries and hidden overhangs and for hands free support removal. The support material should be rigid in nature. The printer should be able to print with the same support material for all the material and should dissolve using the same support removal equipment and solvent/chemical Support material should be easy to melt away.	
13.	Material Handling	Material handling systems should be part of the Printer with material loading, feeding and storage management system. All material spool/cartridges (model and support) should indicate the quantity of material available in the spool / cartridge at any instance of the machine operation during idle or run time. The machine shall pause and prompt the operator to replenish material and resume printing in case of the material (for both model and support) gets consumed during the build process.	
14.	Layer Height	40 um or more	
15.	Build Plate Leveling	Pre-calibrated leveling	
16.	Calibrations	Calibration of X, Y, Z axis and Nozzle, print head before the start of each job.	
17.	Noise Emissions (Acoustic)	<80 dB(A) when building	
18.	Operating Ambient Temperature	18-40 degree C, 10-90 % RH non-condensing	
19.	Monitoring	Front side shall be transparent to see the manufacturing process.	
20.	Input Voltage	200-240 V AC	
21.	Over current Rating	20A	
22.	Phase	Single Phase	
23.	Wiring System	3W (L,N,G)	
24.	Software	1. Software supplied must be from the	

		same OEM and should be compatible with Windows 10 or higher version. 2. Software should be able to import any native CAD formats like Stp native files of CAD packages such as Solidworks, Catia, Creo, Siemens, Inventor etc. 3. Software shall be able to generate different internal customizable build styles (honeycomb to solid) along various regions/segment of the part along the same cross section. Software should also allow user to edit the internal structure of each layer and/or group of layers of the CAD model. 4. Software shall allow user to import assembly CAD files and change interior fill of each component of the assembly individually. 5. Software shall have ability to pre-program pauses on any layer of the generated slice file to add metal inserts.	
25.	Printer Controller	1. User Interface: min 4 inch Touch Screen. 2. Network/Connectivity: Ethernet/ LAN, USB port. 3. Resume Print after Power Outage with ups backup	
26.	UPS	5 KVA with min 30 min backup.	
27.	Warranty	Comprehensive 2 Years warranty for all components should be offered	
28.	Certification	CB/ CE/ RoHS / IS	
29.	Tool Kit and accessories with Machine if any	Bidder to specify	
30.	Emergency stop	Printer should be equipped with emergency stop operation to stop operation during printing if needed	

Conditions:

1. Machine should be supply with all accessories including all the tools and manual including Installation, Commissioning & Training will be provided to our staff for free of cost at our center.

2. 3, 4 , 5 yr comprehensive AMC is in the scope of vendor

3. Note: ALIMCO to provide Air conditioned chamber to maintain the operating temperature of the printer

Technical Specification of 3D Printing Machine-Plastic-Composite

S. No.	Parameters	Description/Sizes	Comply
1.	Printing Process/Technology	Continuous filament fabrication	Ok
2.	maximum Build Size-(W×D×H):	300×250×200 mm , 10kg (max)	
3.	Print Chamber	Chamber should auto lock during operation	
4.	Build Plate	Build plate should be clipped to the build platform	
5.	Print System	2 Distinct nozzles/for build and reinforcement material	
6.	Calibrations	Calibration of X, Y, Z axis and Nozzle, print head before the start of each job.	
7.	Print Speed	30 – 100 mm/s	
8.	Print head change	Capability to print different materials without changing the print heads/ Nozzles	
9.	Power Requirements	100-240 VAC (20 A peak)	
10.	Materials	i) Production Grade Materials with proven Industry performance. ii) The printer should be able to build in engineering grade thermoplastics. The parameters for the default materials such as Nozzle Temperature, Chamber Temperature, and Chamber heat circulations, Extrusion Rates etc. Should be factory programmed into the machine and slicing software and the machine should be able to print any geometry without the user having to tweak/adjust the parameters. iii) UV Stable Thermoplastic.Nylon White ,Carbon fiber, fiberglass, Kevlar®, HSHT fiberglass reinforced thermoplastic for High Strength Applications Tensile Strength upto 800 MPa	
11.	Media	Filament fed	
12.	Support Material	The machine should be capable to build parts in all material with Rigid Soluble support filament to be able to print	

		trapped geometries and hidden overhangs and for hands free support removal. The support material should be rigid in nature. Support material Should easily removable from part	
13.	Material Handling	Material handling systems should be part of the Printer with material loading, feeding and storage management system. All material spool/cartridges (model and support) should indicate the quantity of material available in the spool / cartridge at any instance of the machine operation during idle or run time. The machine shall pause and prompt the operator to replenish material and resume printing in case of the material (for both model and support) gets consumed during the build process.	
14.	Layer Height	50um or more	
15.	Build Plate Leveling	Pre-calibrated leveling	
16.	Calibrations	Calibration of X, Y, Z axis and Nozzle, print head before the start of each job.	
17.	Noise Emissions (Acoustic)	<50 dB(A) when building	
18.	Operating Ambient Temperature	18-40 degree C, 10-90 % RH non-condensing	
19.	Monitoring	Front side shall be transparent to see the manufacturing process.	
20.	Input Voltage	200-240 V AC	
21.	Over current Rating	20A	
22.	Phase	Single Phase	
23.	Wiring System	3W (L,N,G)	
24.	Software	1. Software supplied must be from the same OEM and should be compatible with Windows 10 or higher version. 2. Software should be able to import any native CAD formats like STL and native files of CAD packages such as Solidworks, Catia, Creo, Siemens, Inventor etc. 3. Software shall be able to generate different internal customizable build styles (honeycomb to solid) along various regions/segment of the part along the same cross	

		section. Software should also allow user to edit the internal structure of each layer and/or group of layers of the CAD model. 4. Software shall allow user to import assembly CAD files and change interior fill of each component of the assembly individually. 5. Software shall have ability to pre-program pauses on any layer of the generated slice file to add metal inserts.	
25.	Printer Controller	1. User Interface: min 4 inch Touch Screen. 2. Network/Connectivity: Ethernet/ LAN, USB port. 3. Resume Print after Power Outage with ups backup	
26.	UPS	5 KVA with min 30 min backup.	
27.	Warranty	Comprehensive 2 Years warranty for all components should be offered	
28.	Certification	CB/ CE/ RoHS / IS	
29.	Tool Kit and accessories with Machine if any	Bidder to specify	
30.	Emergency stop	Printer should be equipped with emergency stop operation to stop operation during printing if needed	

Conditions:

1. Machine should be supply with all accessories including all the tools and manual including Installation, Commissioning & Training will be provided to our staff for free of cost at our center.

2. 3, 4 , 5 yr comprehensive AMC is in the scope of vendor

3. Note: ALIMCO to provide Air conditioned chamber to maintain the operating temperature of the printer