

S.No:

Date:

CENTRAL RESEARCH FACILITY (CRF)

**MAULANA AZAD NATIONAL INSTITUTE OF TECHNOLOGY BHOPAL-462003
(M.P)**

USER REQUIREMENT FORM: 3-AXIS ADDITIVE-SUBTRACTIVE HYBRID METAL MACHINE

Name of User	Designation & ID No/ Scholar No.	Name of Guide/Supervisor & Email Id
Name of Department/Institute/ Industry	Email and Contact No.	
User Category: Industry / Educational Institutes / Govt R&D Institutions or Labs / MANIT (Funded/Non-funded)		

1. ADDITIVE MODULE

Additive Manufacturing
(tick the appropriate option)

Required ☐
Not Required ☐

1.1. Work Volume: Co₂ wire laser Additive Manufacturing Machine (Make MELTIO-Spain)

Particular	Machine Specification	User requirements
Length (X)	300 mm	
Width (Y)	300 mm	
Height (Z)	300 mm	

1.2. Feedstock Material

Particular	Details	User requirements
Material Grade	Stainless Steel (316L) Stainless Steel (174ph) Mild Steel (ER70-s) Tool Steel (h11) Titanium 64	
Wire Diameter	0.9 mm to 1mm	
Nominal Chemical Composition		
Stainless steel (316L)	Fe as the balance element, with 0–0.03 wt.% C, 0.65–1.0 wt.% Si, 1.0–2.5 wt.% Mn, 18.0–20.0 wt.% Cr, 11.0–14.0 wt.% Ni, and 2.0–3.0 wt.% Mo.	
Stainless steel (17-4Ph)	Fe as the balance element, with a maximum of 0.05 wt.% C, 4.5–5.0 wt.% Ni, a maximum of 0.90 wt.% Si, 0.25–0.75 wt.% Mn, 16.0–16.75 wt.% Cr, a maximum of 0.75 wt.%	

Titanium 64	Mo, 0.15–0.30 wt.% Nb, 3.25–4.0 wt.% Cu, and a maximum of 0.03 wt.% P. Ti as the balance element, with 5.5–6.75 wt.% Al, 3.5–4.5 wt.% V, a maximum of 0.4 wt.% Fe, 0.08 wt.% C, 0.05 wt.% N, 0.015 wt.% H, and 0.2 wt.% O	
Material Form	Wire	

1.3. Substrate Material

Particular	Details	User requirements
Material Grade	Titanium , stainless steel	
Substrate size	Titanium plate (300X300) Titanium plate (100X100) Stainless Steel plate (200X150) Stainless Steel plate (300X200)	

1.4. Process Parameters

If the desired process parameters are unknown, please write "Default Parameters". The process engineer will select suitable values based on the application.

Particular	Details	User requirements
Additive Manufacturing Required	Yes / No	
Build Orientation	Vertical (Z-direction)	
Laser Power	1000–1200 W (Maximum 1200 W)	
Printing Feed Rate (Scan Speed)	900–1200 mm\min	
Layer Height	0.60 mm to 0.80 MM	
Scan Strategy	Bidirectional (Zig-Zag)	
Overlap Between Consecutive Tracks	40 %	

1.5. Shielding Gas

Particular	Details	User requirements
Type & Flow Rate	High purity argon (99.99%) & 15 LPM	

2. SUBTRACTIVE MODULE

Subtractive Manufacturing
(tick the appropriate option)

Required ☐
Not Required ☐

2.1. Work Volume: 3-Axis CNC Vertical Machining Centre (Make HASS-USA)

Particular	Machine Specification	User requirements
Length (X)	800 mm	
Width (Y)	500 mm	
Height (Z)	350 mm	

Dimensional Tolerance	± 0.2 mm	
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2.2. Process Parameters

Particular	Details	User requirements
Machining Required	Yes / No	
Maximum Rpm	5000RPM	
Maximum Cutting Feed	12,700 mm/min	
Depth of Cut	0.5 to 1 mm	
Tool Preference	Carbide flat end mill (10mm,12mm,16mm) Face mill (63mm or 80mm) Carbide ball nose end mill (10mm, 12mm , 16mm)	
Coolant Requirement	DM Water + Cutting oil	

3. POST-PROCESSING MODULE

EDM Machining Required ☐
(tick the appropriate option) Not Required ☐

3.1. Work Volume: Wire Cut Electrical Discharge Machining (EDM) (Make Phillips -7735HS)

Particular	Machine Specification	User requirements
Length (X)	350 mm	
Width (Y)	450 mm	
Height (Z)	300 mm	
Dimensional Tolerance	±10-20 µm	
U&V	± 6 Degree	

3.2. Process Parameters

S. No.	Parameter	Details	User requirements
1	Wire Material	Molybdenum	
2	Wire Diameter (mm)	0.18mm	
3	Pulse ON Time (Ton) (µs)	10-60	
4	Pulse OFF Time (Toff) (µs)	10-30	
5	Peak Current (A)	7	
6	Wire Feed Rate	200	
7	Flushing Pressure (kg/cm ²)	50-180	
8	Dielectric Medium	Deionized Water	
9	Dielectric Conductivity (µS/cm)	1-3	
10	Cutting Speed (HZ)	20-220	

4. Experimental Plan

Please attach a separate PDF containing the user requirements for Additive Manufacturing, Subtractive Manufacturing, and Post-Processing, as specified in Sections 1, 2, and 3, along with any other relevant information.

The user may utilize any one of these processes, or a suitable combination of them, based on their specific requirements.

PDF Attached: Yes / No

Geometrical Modelling file Attached: Yes / No

Particular	User Input
CAD File Name (STEP/STP): *	
CAD File Name (STL):	
Engineering Drawing File Name (PDF)	

Declaration

I hereby declare that the information provided above is true and complete to the best of my knowledge. I understand that the submitted request will undergo technical feasibility assessment, and the final quotation and estimated completion time will be communicated within seven (07) working days.

User Category	
Name & Signature of User	
Name & Signature of Supervisor	
Date	

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Particular	Details
Feasibility (tick the appropriate option)	Accepted ☐ Modification Required ☐ Not Feasible ☐
A. Additive Manufacturing charges	Rs. _____
B. Subtractive Manufacturing charges	Rs. _____
C. Post-Processing charges	Rs. _____
D. Material charges	Rs. _____
E. Tooling charges	Rs. _____
F. GST:	Rs. _____
Total Cost (Sum of A,B,C ,D,E & F)	Rs. _____
Estimated Time (Sum of A,B & C)	

Important Notes

- **Additive/ Subtractive Manufacturing Module – User Charges**
 - **MANIT Users:** ₹1,200/hour.
 - **Other Educational Institutions:** ₹1,500/hour.
 - **Government R&D Institutions/Laboratories:** ₹1,800/hour.
 - **Industry (Non-Funded Projects):** ₹2,500/hour.
 - **Industry (Funded/Commercial Projects):** ₹3,000/hour.
- **Post-Processing Module – User Charges**
 - **Wire-cut (EDM):** ₹500/hour (if applicable).
- **Material charges:** Based on the material consumption and the prevailing market rate.
- **Tooling charges:** Applicable as per design and manufacturing requirements.
- **CAD requirement*:** A STEP (.step/.stp) file is required for processing.
- **Feasibility and quotation:** The operator will communicate the feasibility of the job and the applicable charges within 7 working days of receiving the complete request.
- **GST:** 18% extra, as applicable.