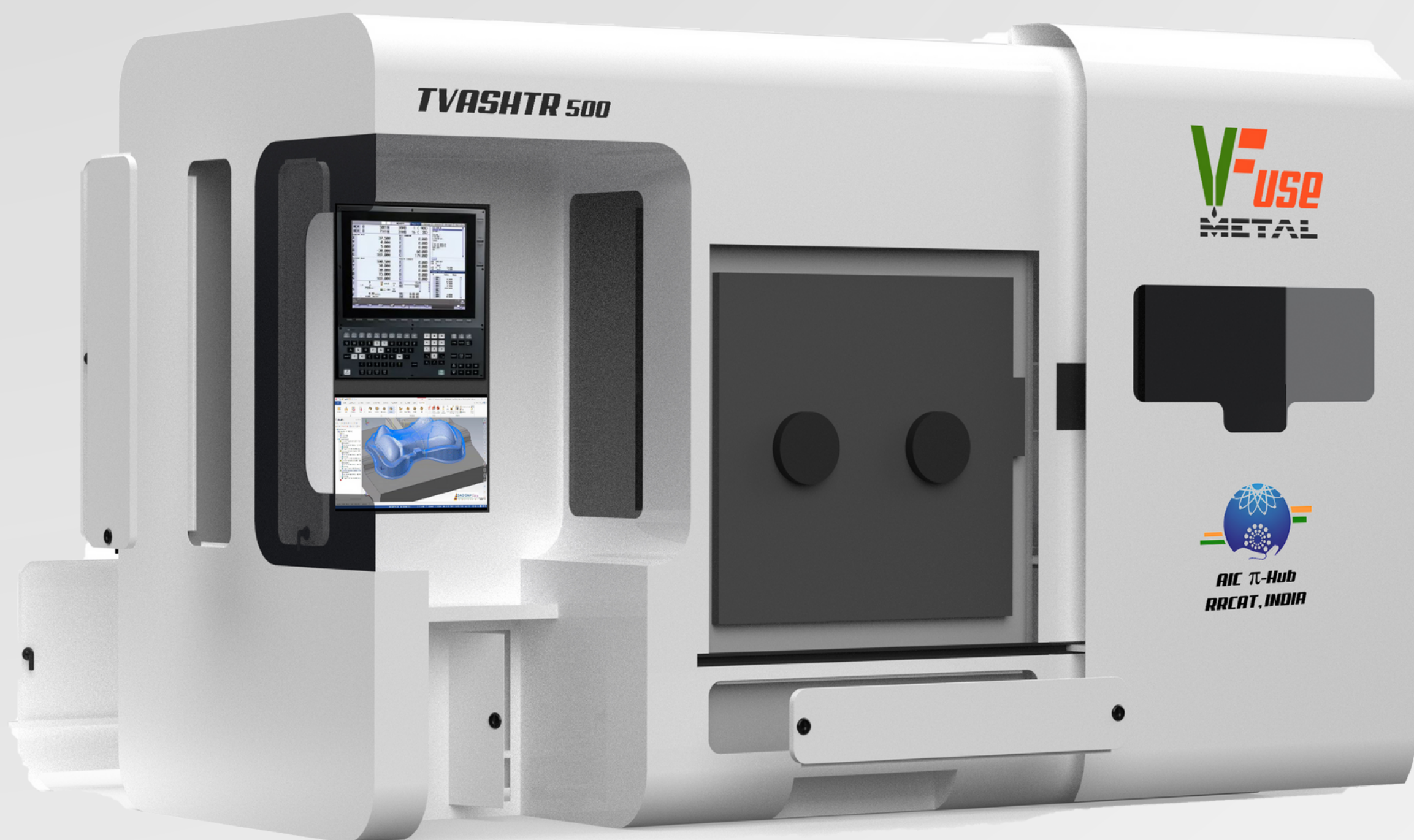
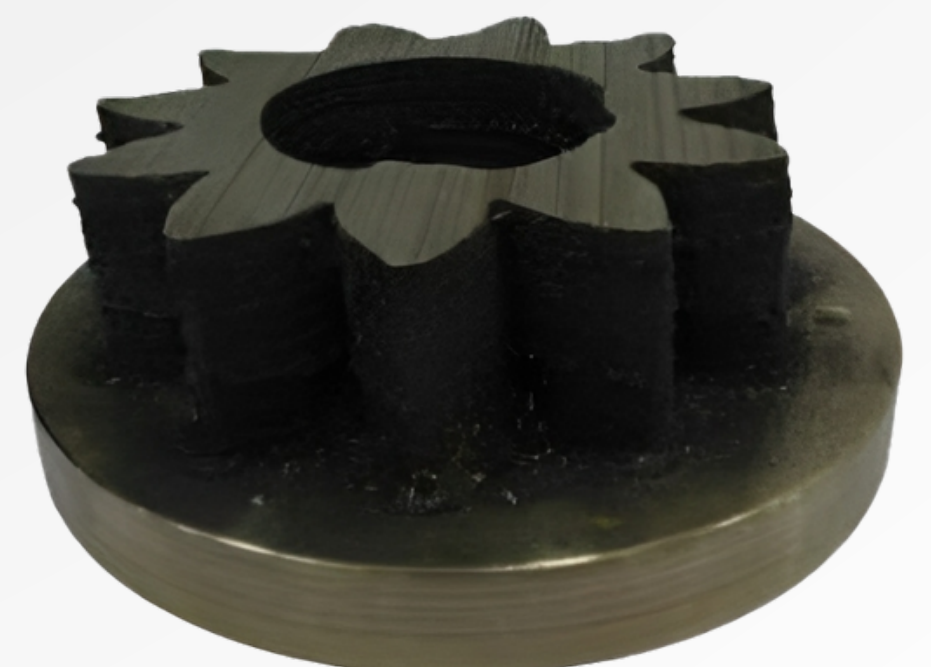
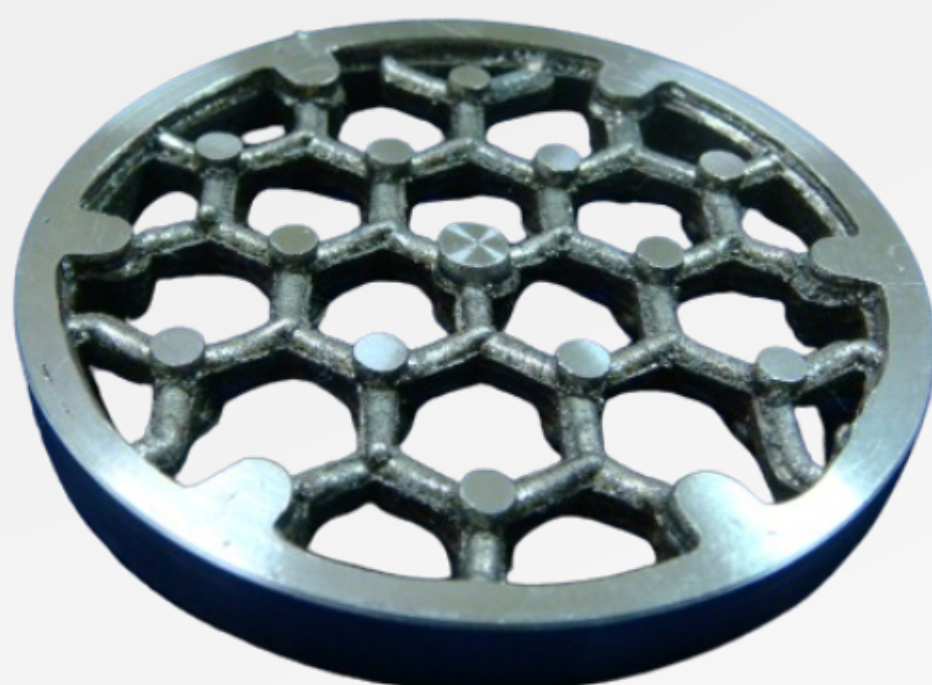
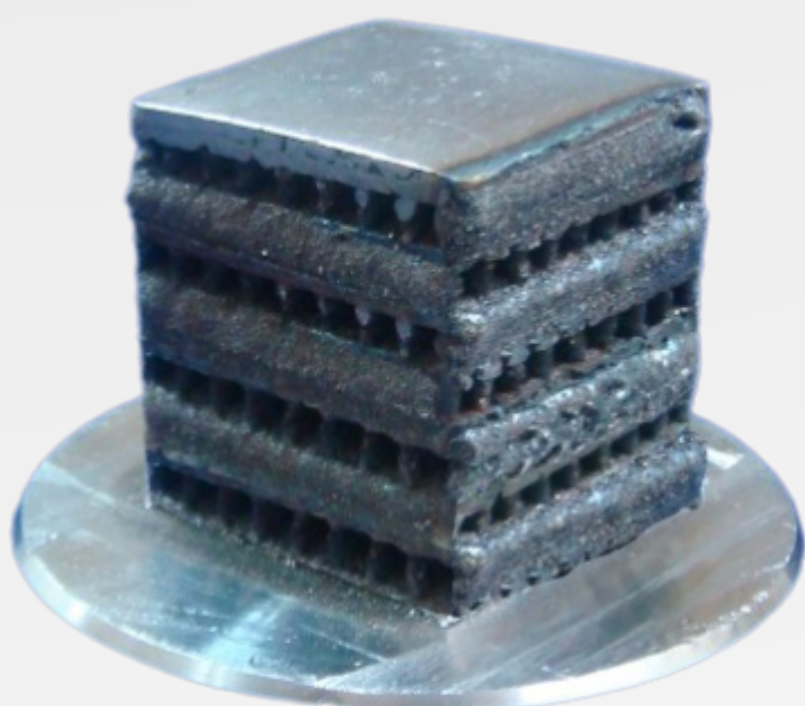


Technology Jointly Developed by

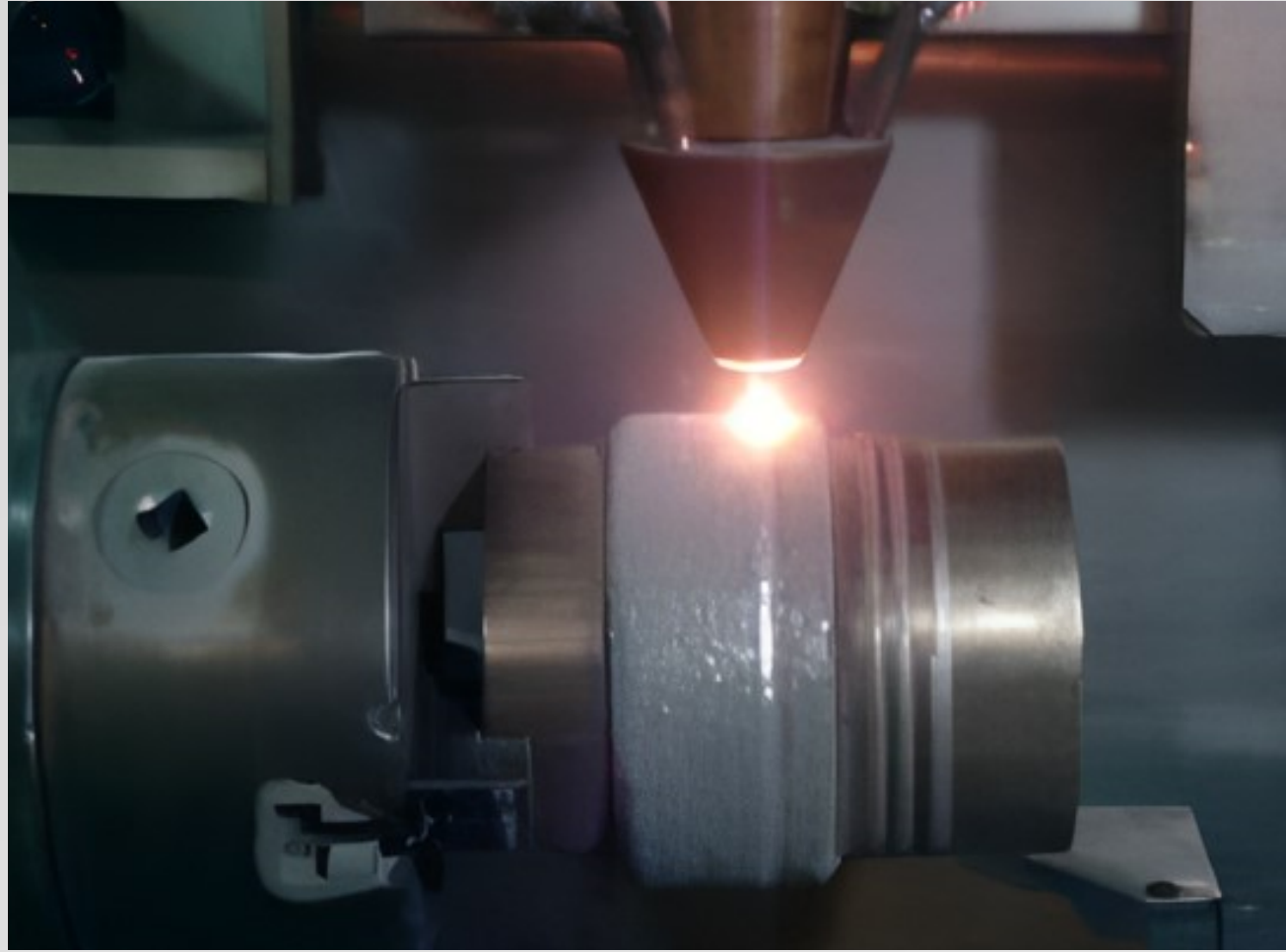


Indegenious Technology|| Proven for 15+ Years



TVASHTR 500 - A LAM DED System is the joint development of AIC π-Hub promoted by RRCAT Indore and **VFuse** Metal.

A step towards **आत्मनिर्भर भारत**.

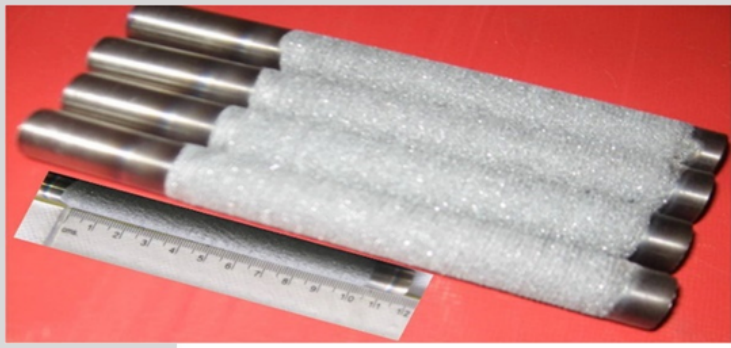


- High Laser Power
- Inert chamber
- 5 Axis (Rotary and Tilt table)
- Independent Nozzle Axis with Optional ID Clad Nozzle
- Twin Powder Feeder
- Argon Recirculation Unit
- Antechamber

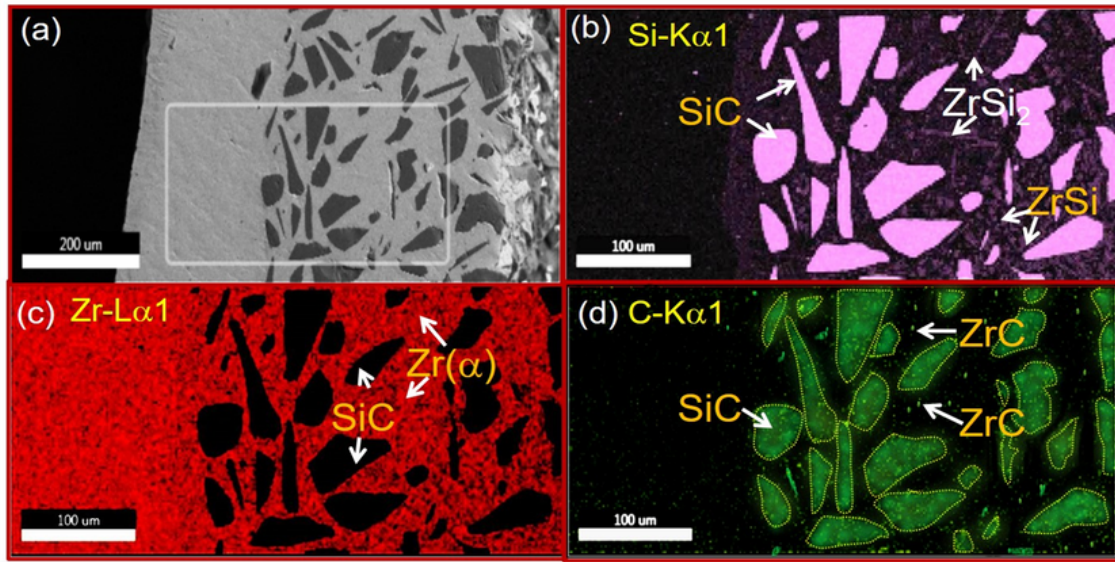
Laser	Multi Mode Fiber Laser 2000 W Continuous Wave
Beam Diameter	1-2.5 mm
Powder Feed Rate(316L)	2-40 Gram/Min.
Build Rate (316 L)	180-240 Gram/Hr
Processing Station Configuration	6 axis (5+1)
XYZ Stroke	500 x 500 x 300 mm
X-Y, Rotary-Tilt Table Payload	200 Kg, 60 Kg (Respectively)
Positional Accuracy	± 20 μm
Controller	Mitsubishi M80 Type A (Windows supported)
Material Support	Ni Based Alloys, Fe Based Alloys, Ti Based Alloys, Cu Based Alloys, Colmonoy, Stellite-6, Hastelloy, WC, Triballoy, NiCuCr, Graphite
Pre-processing CAM Software	MasterCam A+ Additive Module
E/Connection	400 Volt 3NPE, 32 A, 50/60 Hz, 15 kW
Machine Dimension	3900X 2000 X 2730 mm

Applications Developed on TVASHTR

SiC Clad Layers on Zr-4 using LAM-DED Collaborator BARC Mumbai

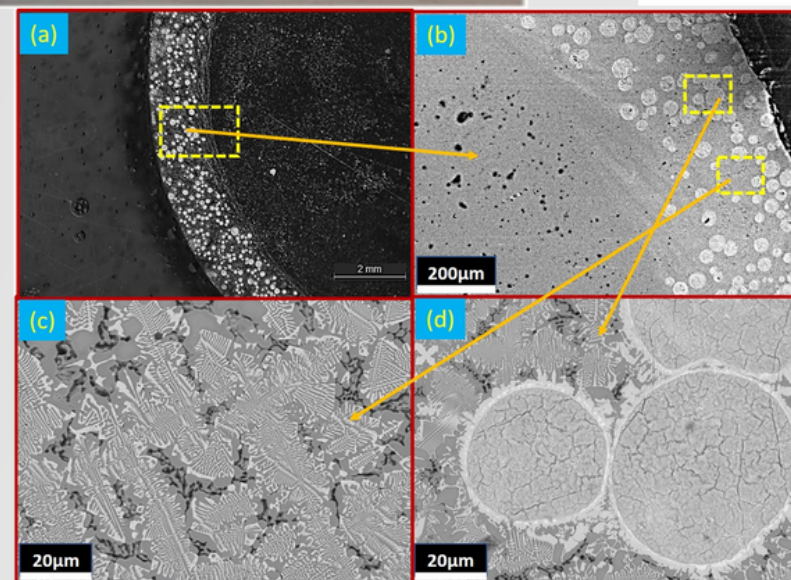


SiC clad layers (~ 200 μm) on Zr-4 is developed using LAM-DED process to improve the safety of nuclear reactor during accident by avoiding the high temperature oxidation.



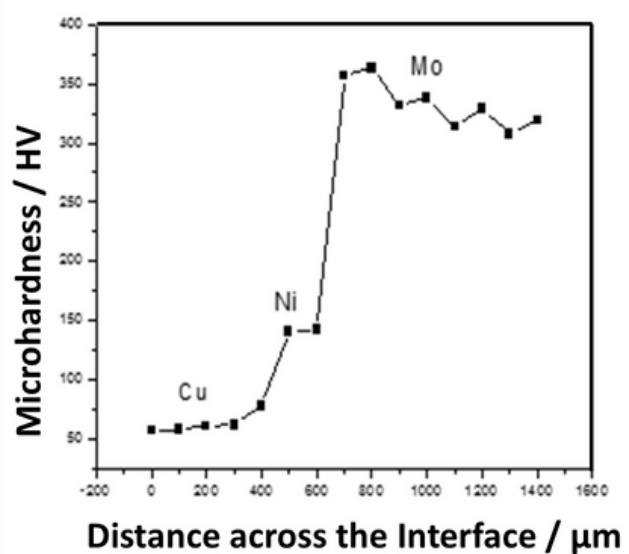
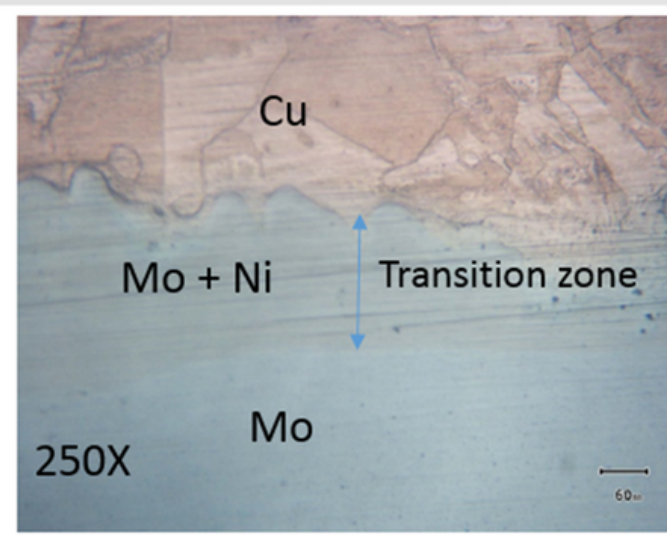
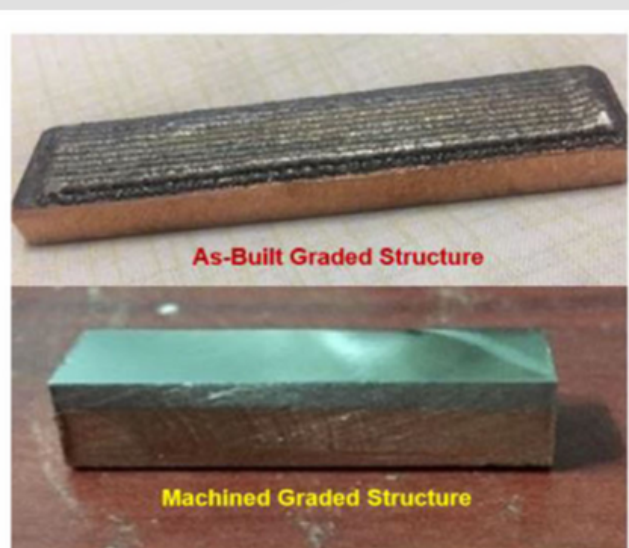
Conventionally, SiC coating is deposited using techniques, such as physical/chemical vapor deposition and magnetron-based techniques and thickness is limited to 20 μm due to delamination effect as a result of high thermal expansivity difference.

WC Clad Layers on SS 304 using LAM-DED Collaborator BARC Mumbai



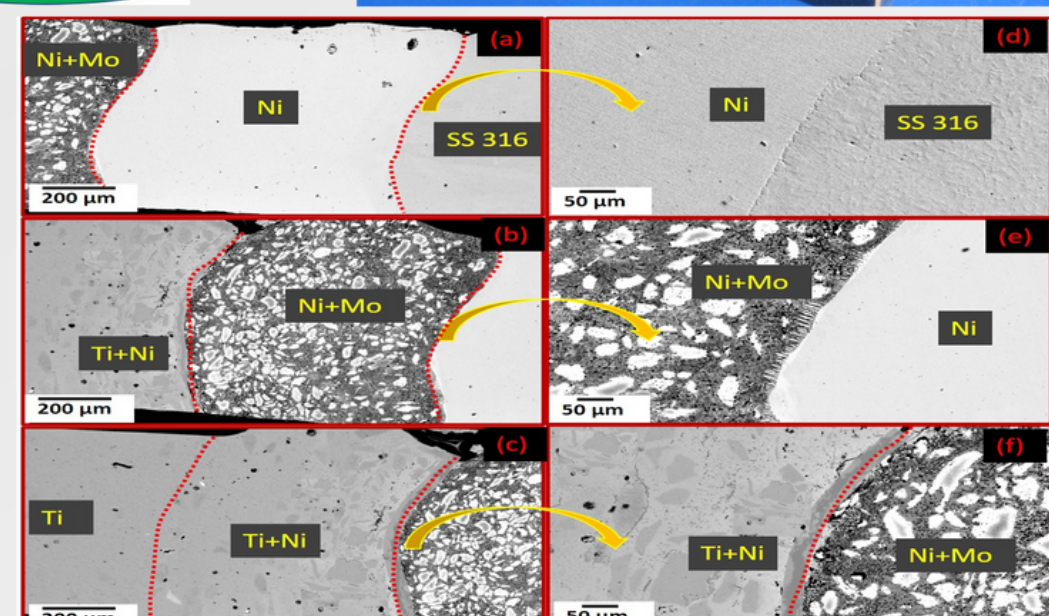
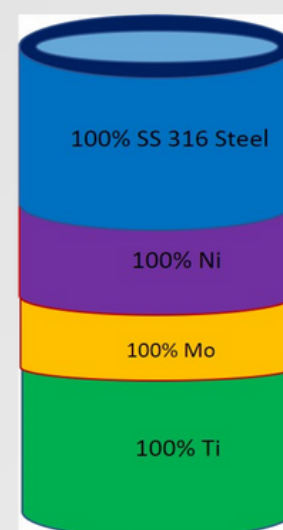
Successful deposition of WC on SS 304 steel achieved without any defect and crack using LAM-DED Process

Mo Cladding on CuCrZr Alloy using LAM-DED Collaborator IPR Ahmadabad

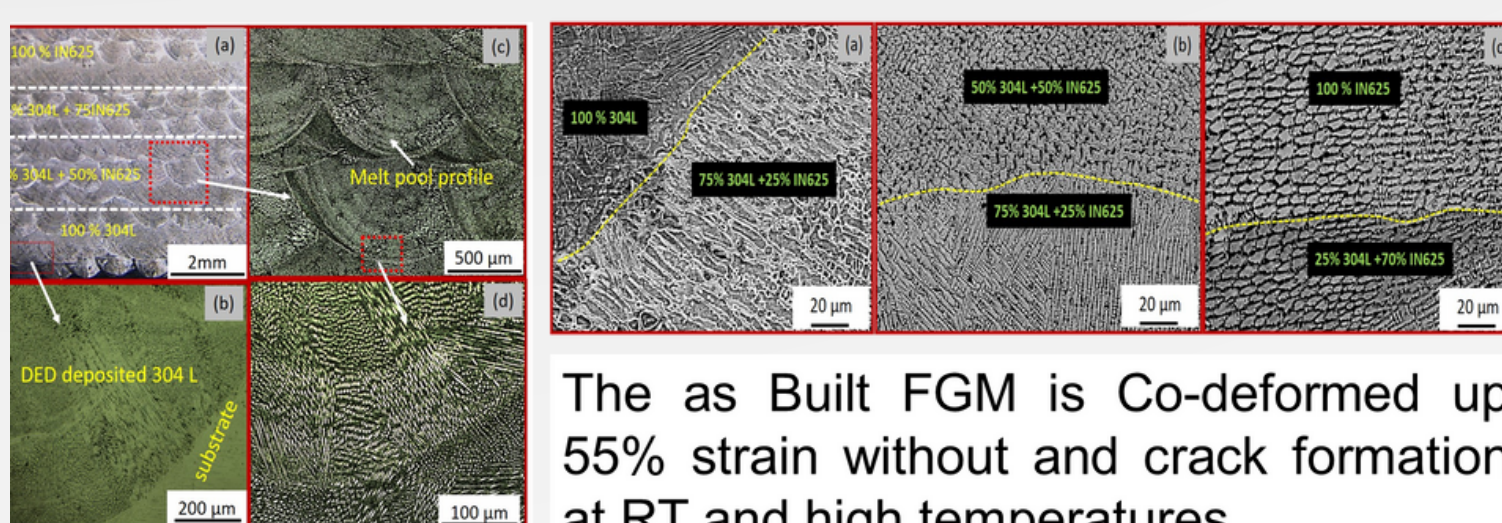
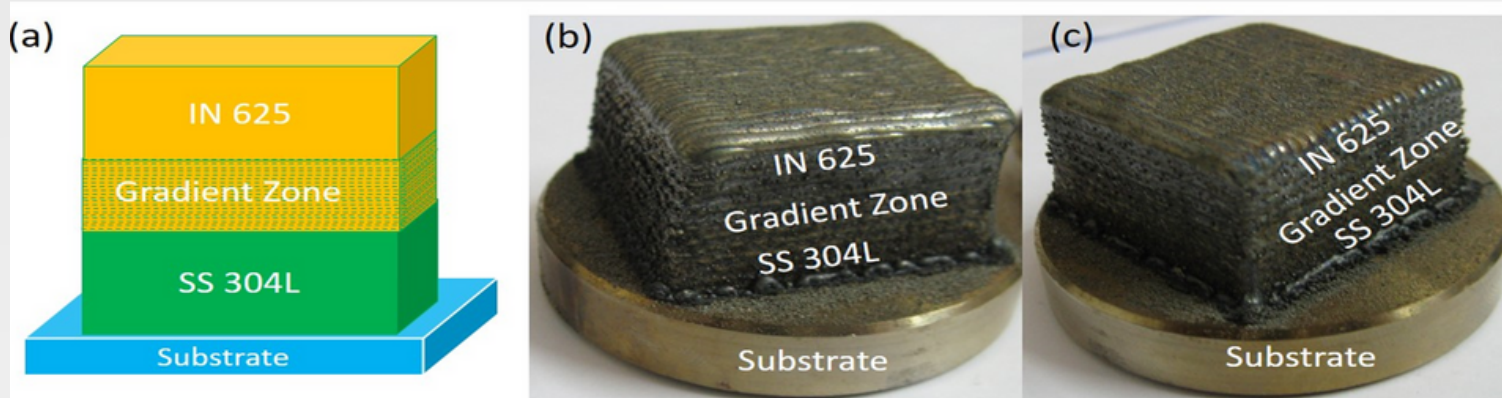


Successful deposition of Mo on Cu substrate with interlayer of Ni achieved without any defect and crack using LAM-DED Process

SS – Ti transition Joint with Interlayer using LAM-DED Collaborator IGCAR, Kalpakkam

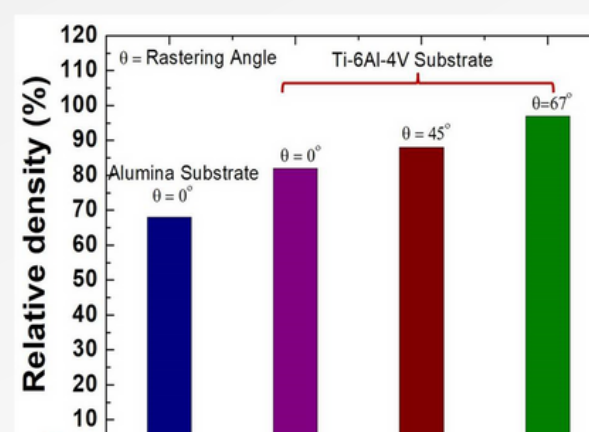
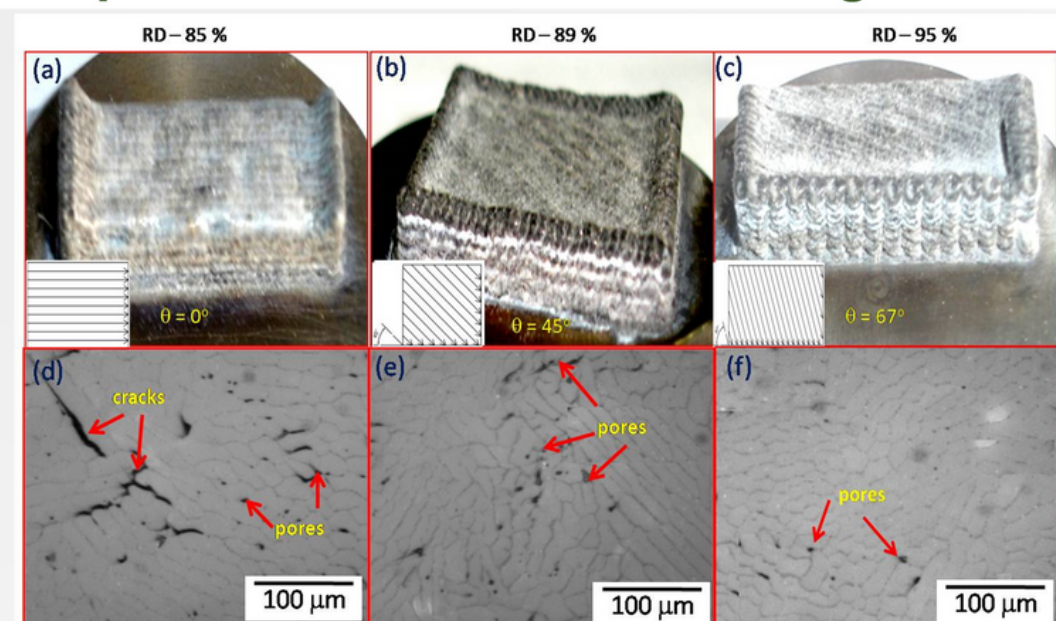


IN625-SS 304L Bimetallic FGM using LAM-DED Collaborator IGCAR, Kalpakkam



The as Built FGM is Co-deformed up 55% strain without and crack formation at RT and high temperatures

Development of Al₂O₃ Ceramic using LAM-DED

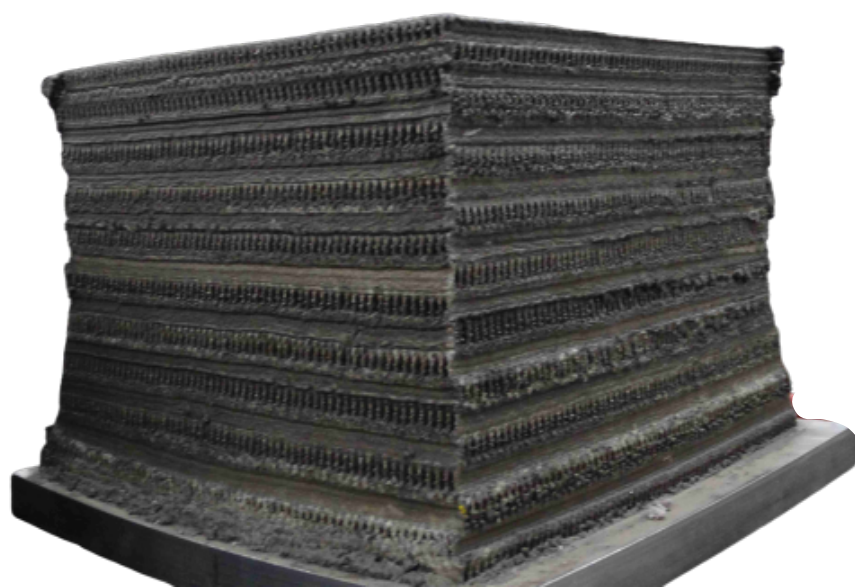


Using LAM-DED Al₂O₃ structures with maximum density 95 % are printed by optimizing various process parameters

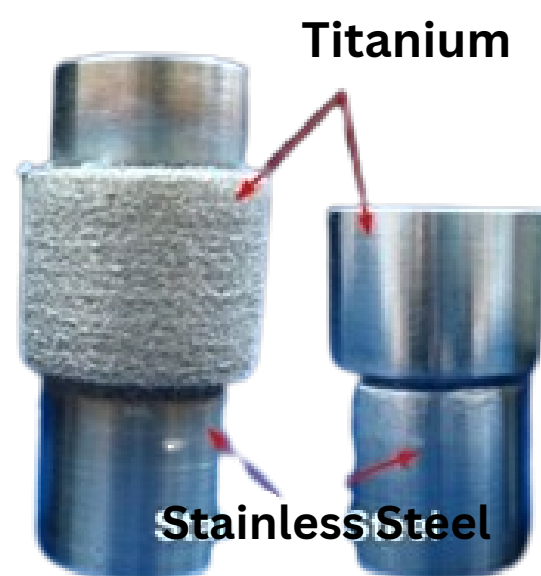
Proven Applications on DED Based System

- **MRO:** Maintenance, Repair and Operations, Repairing worn-out components typically saves cost and time over purchasing new ones.
- **Cladding/ Coatings:** Metal Coatings on parts will increase the efficiency and life of the part thus saving productive cost and Uptime.
- **FGM:** Functionally Graded Materials, by varying the material composition or grain structure properties can be manipulated to improve the overall properties of conventional materials.

Some Parts Printed on TVASHTR



Cross Channel Heat Exchanger IN625



Ti-SS Transition Joint



WC Coating on SS304



ID Clad of IN625 On SS316



Stellite-6 Clad on MS Punch



Ti Clad on SS316 Dumbbell

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