ROBOTIC ADDITIVE MANUFACTURING TECHNOLOGIES

WAAM (Wire Arc Additive Manufacturing)
Laser-DED (Laser Directed Energy Deposition)

Special Series

Compact Series

Lab Series

Low Buy-to-Fly Ratios

Achieves low BTF ratios (up to 1.5) by precisely depositing material only where needed, minimizing waste and enabling efficient use of high-value metals.

Cost Effective Production

Lower production costs by minimizing raw material waste, reducing machining time and allowing for on-demand manufacturing, thus avoiding excessive inventory costs.

Design Freedom

Design and manufacturing freedom aspects from medium to large scale parts using various materials.

Faster Manufacturing

Offers significant advantage on decreasing lead times by up to 80% compared to traditional processes like casting, forging and machining.

Low Carbon Emissions / Green Manufacturing

Eco-friendly manufacturing technology with low CO_2 emission compared to conventional manufacturing.

Diverse Industrial Use

Aerospace, defense, maritime, manufacturing, automative, energy construction, and more.
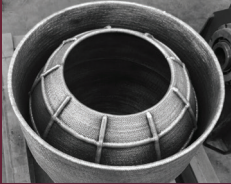
TECHNOLOGIES

- Realtime Process Monitoring
- Closed-Loop Process Control
- Realtime Anomaly Detection
- Melt-Pool Monitoring
- Thermal Monitoring and Control

- Advanced Sensor Fusion Technology
- Digital Twin for WAAM
- High Deposition Rate
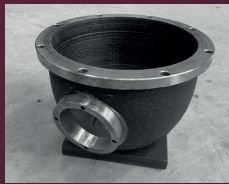- High Stable Arc
- Controllable Heat Input

- Wide Range of Materials
- Cold Metal Transfer Technology
- Easy Robotic Tool Path Planning
- Uninterrupted Large-Scale Manufacturing

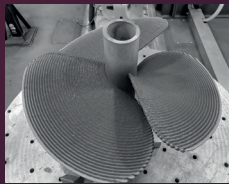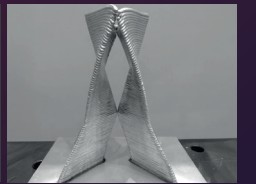### INDUSTRIAL APPLICATIONS

Pressure Vessel
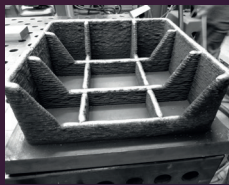
Connector

Propeller

Aesthetic Shape

Composite Mold

Rocket Nozzle

Landing Gear

Valve

METALWORM

Revolutionizing Research on WAAM

MW-LAB Technologies:
▫ Programming with Cobot/Robot
▫ High Stable Arc with CMT
▫ Process Development
▫ New Alloy Processing
▫ In-Situ Monitoring and Control
▫ Digital Twin
▫ Robotic Additive Manufacturing

MW-LAB provide cost effective solutions
for universities, institutes and research centers.
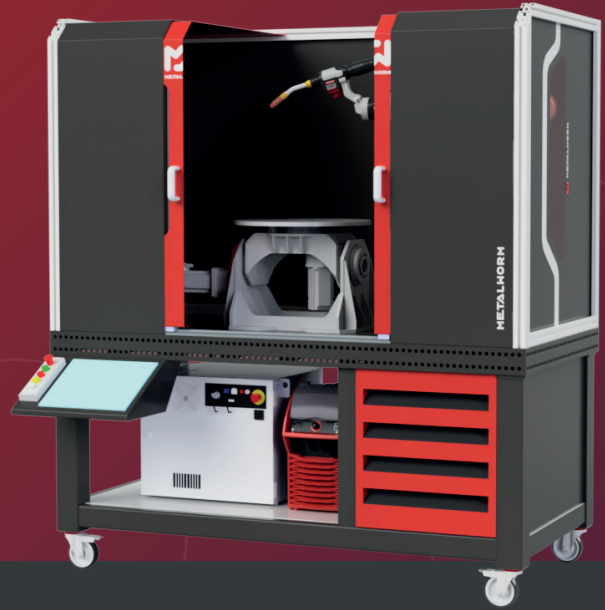
MATERIALS
Aluminum Alloys:
–2319, 4043, 5087, 5183, 5356, 6061, 6063, 7075
Steel Alloys:
–ER70, ER80, ER90, ER120
Stainless Steel Alloys:
–ER304L, ER307, ER316L, ER630, ER2209, ER2594, Invar 36
Nicel Alloys:
–Inconel 625, Inconel 718
Copper Alloys:
–CuAl8Ni6

and More

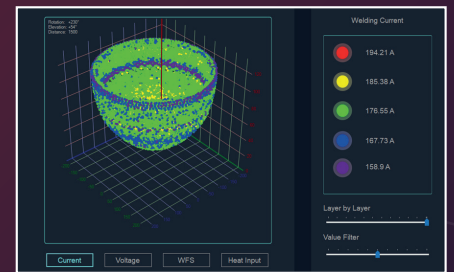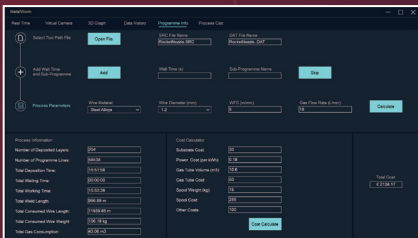## MetalWorm Diagnostic Software
▫ Real Time Data Collection
▫ Real Time Process Monitoring
▫ Digital Twin for WAAM
▫ Strong Process/Material Library
▫ Melt Pool Monitoring
▫ Realtime Process Control
▫ Arc Voltage Control
▫ Temperature Control

MetalWorm Robotic Tool Path Planning
▫ Robot & Process Simulation
▫ Internal Slicing Strategies
▫ Multi Axis Tool Path Planning
▫ External Axis Support
▫ Tool Path Planning by Region
▫ Tool Path Orientation Adjustment
▫ Customize Robot Programs
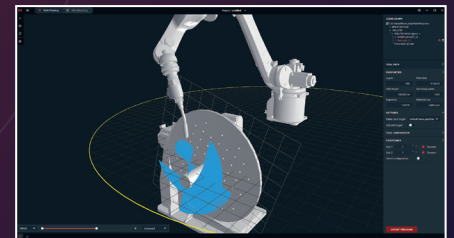▫ Collision Detection

Anomally Detection and Analysis

Process Planning

Real-Time Process Monitoring

Robotic Toolpath Planning

METALWORM

+90 850 223 0 468

info@metalworm.com

metalworm.com

TEKNOPARK ANKARA
ENGINEERING OFFICE
İvedik OSB Mah. 2224 Cad. No: 1/157 C Blok
216 Yenimahalle Ankara/TÜRKİYE

ANKARA EMAI
MANUFACTURING - ENGINEERING CAMPUS
Sarayosb Mah. Uzay ve Havacılık OSB NO: 187AA
Kahramankazan 06980 Ankara/TÜRKİYE