ADDERE
ADDITIVE MANUFACTURING

THE FUTURE OF MANUFACTURING

ADDere is a cutting-edge laser-wire additive manufacturing process for 3D printing high complexity, industrial-grade metal components.

ADDere's systems, engines and print services are ideal for large part, low-volume production, prototyping and much, much more!

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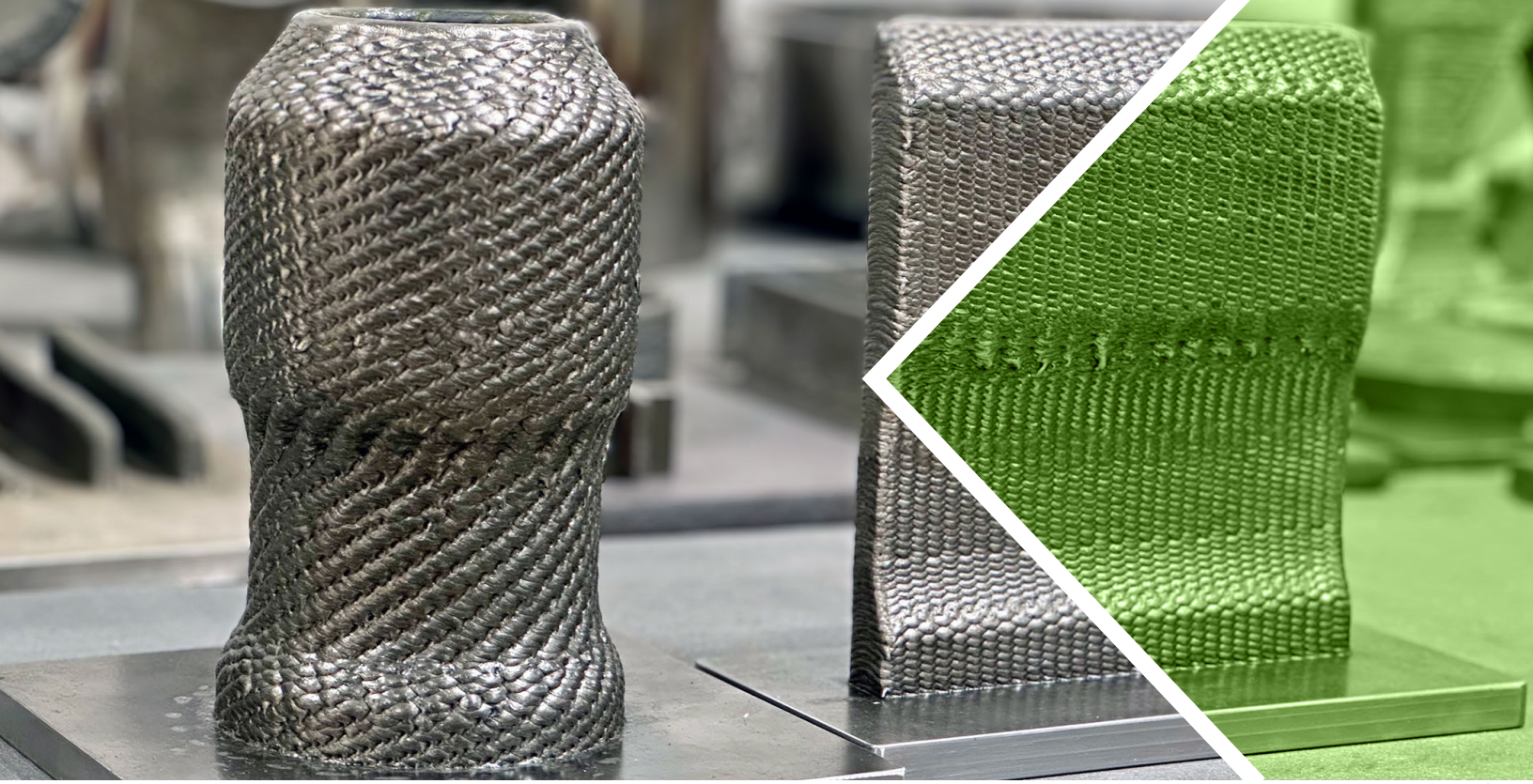


What Makes ADDere the Future

At its heart, ADDere is a laser-wire additive manufacturing (LWAM) process for 3D printing near net shape, large-scale metal components. ADDere uses a high-powered DED laser to heat the wire as it is fed into the melt pool while a hot wire delivery system pre-heats the incoming wire. ADDere achieves best-in-class metal layer deposition with virtually no impurities and a part density greater than 99.99%. ADDere simply sources the part construction and design from standard 3D modelled CAD drawings to produce the final near net shape metal alloy part.

ADDERE'S THREE AREAS OF SERVICE FOR OUR PARTNERS

We are **focused** on proofing out the build and ensuring repeatability in the 3D printing process

We **assist** our partners with 3D printing metal parts on-demand as an in-house service that they can depend on

We **provide** our partners the option to print parts in their facility through the use of either a standard or a custom-built system

A Brief History of ADDere

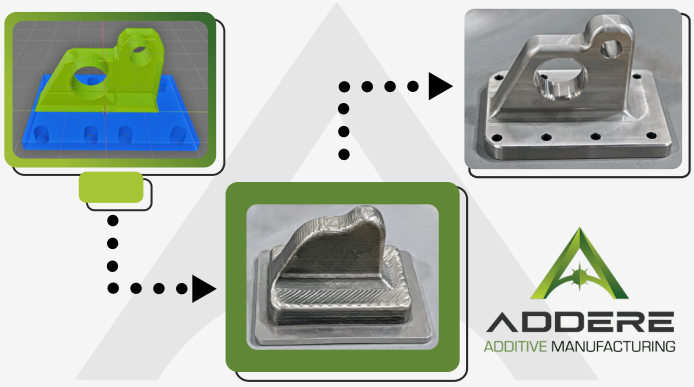
ADDere Additive Manufacturing was founded by Midwest Engineered Systems (MWES) in 2016. The early years of ADDere was focused on systems and process development. By developing the LWAM process, ADDere was born.

In just two years, ADDere was evaluated by GKN Aerospace who chose our technology to install in Oak Ridge National Labs (ORNL). The custom built system is designed to exclusively print Titanium Ti-64 aerospace components.

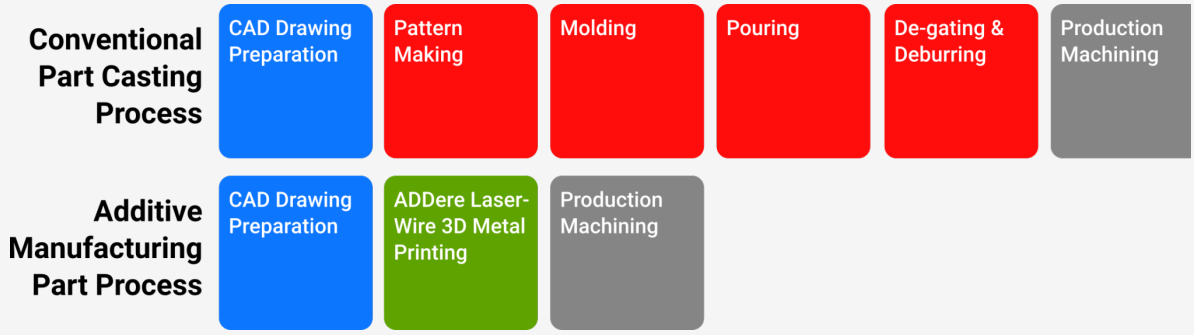
Today, ADDere offers options for three complete additive systems and dedicated in-house 3D printing services.

Where ADDere Excels Over Casting

ADDere's best-in-class LWAM process revolutionizes the metal manufacturing industry by drastically improving the time to market, reducing the cost of materials, providing consistent performance and eliminating scrap waste.



Parts and processes that could take anywhere from weeks to months to create can now e accomplished within days or even hours. Complex parts that would have required casting can be 3D printed in a variety of metals, side-stepping the many steps involved in common casting processes.



Applications For ADDere

Coupled with ADDere's production envelope and versatility due to the use of industrial robotics for its movement, ADDere offers a variety of opportunities to take additive manufacturing far beyond what previously established manufacturing solutions can offer.

- ▸ Prototyping & Full-Scale Component Testing
- ▸ Large Component Repair & Modification
- ▸ Multi-Material Part Cladding
- ▸ Hybrid Manufacturing
- ▸ Reducing Legacy Part Warehousing
- ▸ Low-Run – Large Part Production
- ▸ Eliminate Part Obsolescence
- ▸ Laser Hybrid Welding

Sample Metal Parts ADDere Prints

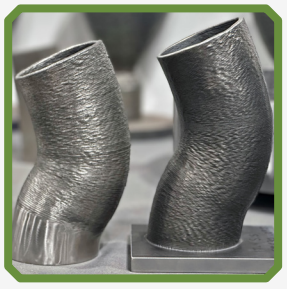
Engine Intake/ Exhaust Guarding

1 meter diameter
Duplex Stainless Steel

Propellers & Impellers

25 cm long blades
Carbon Steel

Piping & Ducts



22 cm tall / 4 mm walls
Stainless Steel

Rocket Thrust Chambers

1 meter tall/wide
Duplex Stainless Steel

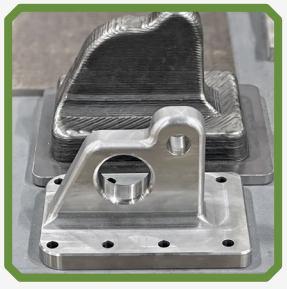
Aerostructures & Airframes

50 cm long
Titanium Ti64

Turbine Blades & Airfoils

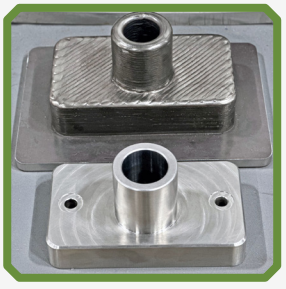
1.8 meters tall
Duplex Stainless Steel

Heavy Tow Point Bracket

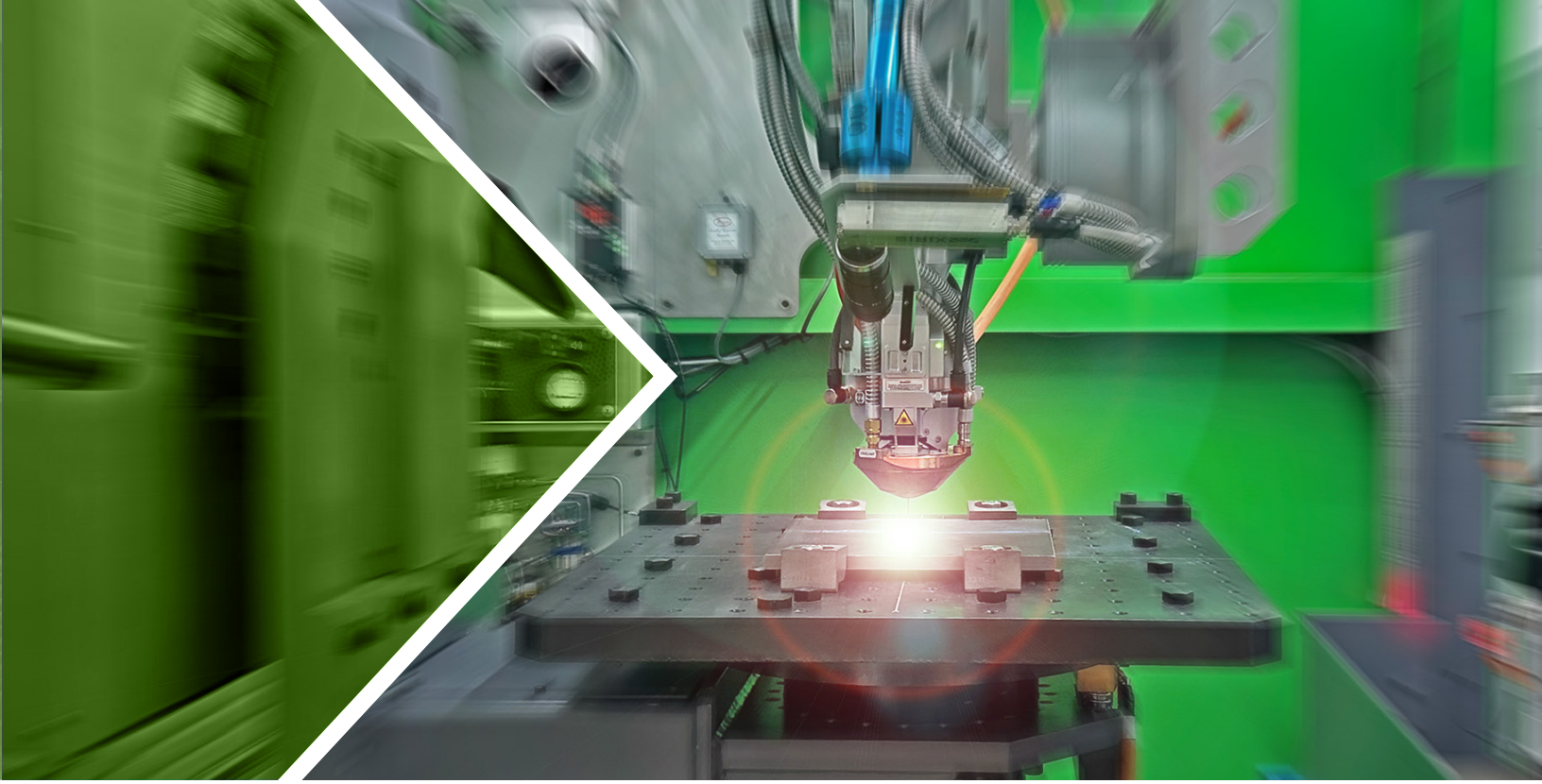


210 x 135 x 180 mm
Stainless Steel

Bearing Housing



200 x 127 x 150 mm
Stainless Steel



Industries Who Benefit with ADDere

ADDere's additive manufacturing process offers a variety of benefits for industries that see a high level of customization or specialization where conventional manufacturing processes might be stretched or inadequate to provide the needed solutions.

AEROSPACE

DEFENSE

MARINE

OFF-HIGHWAY CONSTRUCTION

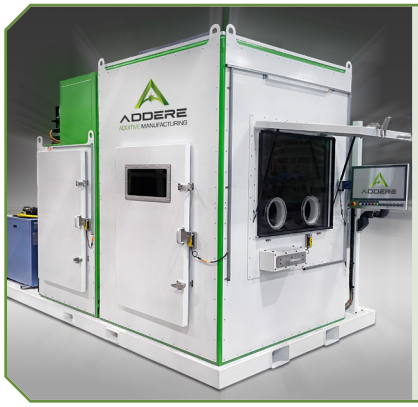
OIL & GAS

PETROCHEMICAL

The ADDere Additive Systems

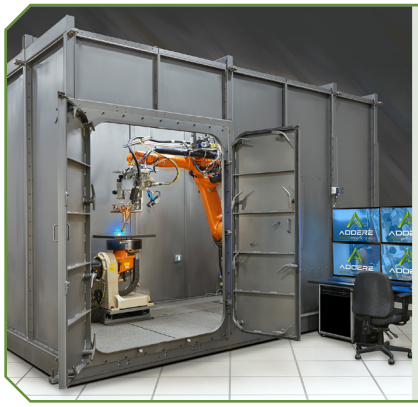
ADDere's complete additive systems consist of three unique enclosures and capabilities. The Small Format System is a transportable, compact system. The Medium Format System is a larger but shop floor-friendly system. The Large Format System is a purpose built custom system ideal for large-scale manufacturing operations and assembly lines. All three systems are powered by ADDere's custom built runtime software package.

ADDere Small Format System



Motion Device	3 or 6-Axis Motion Control Gantry System	**Laser Spot Size**	200µm–6mm
Build Part Size	500mm cubed	**Sensor System**	Real-time, closed-loop fixed optic
Part Max Weight	200 kg plus fixturing	**Data Collection**	Up to 5 samples a sec.
ADDere Engine	4 kW or 8 kW Coaxial	**Laser Safe Enclosure**	Standard with an inert gas environment.
Deposition Rate	4 kg or 8 kg per hour	**Material Delivery**	250-amp continuous hot wire system, tracked by closed-loop feedback control
Wall/Layer Size	5–6mm bead width & 1–2mm layer height		

ADDere Medium Format System



Motion Device	6 or 8-Axis Motion Control Robot System	**Laser Spot Size**	200µm–6mm
Build Part Size	1 meter cubed	**Sensor System**	Real-time, closed-loop fixed optic
Part Max Weight	400 kg plus fixturing	**Data Collection**	Up to 5 samples a sec.
ADDere Engine	4–30 kW Coaxial/Side-wire	**Laser Safe Enclosure**	Standard with an inert gas environment.
Deposition Rate	4 kg or 8 kg per hour	**Material Delivery**	250-amp continuous hot wire system, tracked by closed-loop feedback control
Wall/Layer Size	5–6mm bead width & 1–2mm layer height		

ADDere Large Format System

Motion Device	up to 12-Axis Motion Control Robot System	**Laser Spot Size**	200µm–20mm
Build Part Size	3.6 meter Hemisphere	**Sensor System**	Real-time, closed-loop fixed optic
Part Max Weight	5000 kg plus fixturing	**Data Collection**	Up to 5 samples a sec.
ADDere Engine	4–30 kW Coaxial/Side-wire	**Laser Safe Enclosure**	Standard with an inert gas environment.
Deposition Rate	25 kg per hour	**Material Delivery**	250-amp continuous hot wire system, tracked by closed-loop feedback control
Wall/Layer Size	5–6mm bead width & 1–2mm layer height		

> **The solutions that ADDere provides make additive manufacturing ideal for highly demanding industries like aerospace, defense, petrochemical and more that require trustworthy, common and exotic superalloy large-scale metal printing.**

The ADDere Additive Engines

ADDere's additive engines can be retrofitted onto an existing or new KUKA, ABB or Fanuc industrial robot system. The ADDere engines include the robot end effector (EOAT) module, the hot wire delivery system and the ADDere Runtime Software.

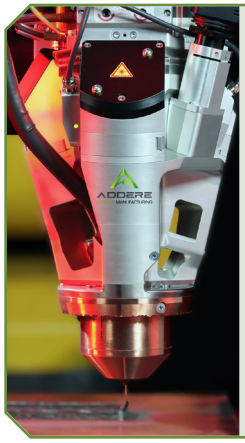
20kW Scanner/Side Wire

Laser Power (max)	20kW Laser
Bead Thickness	4mm - 20mm
Max Deposition Rate	30lb/hr*
Wire Size	0.6 - 1.6mm
Vary Bead Thickness on the Fly	Yes
Water Cooled	Yes

30kW Power Coaxial

Laser Power (max)	30kW Laser
Bead Thickness	<2mm - 15mm
Max Deposition Rate	35lb/hr*
Wire Size	0.6 - 1.6mm
Vary Bead Thickness on the Fly	Yes**
Water Cooled	Yes

8kW Power Coaxial



Laser Power (max)	8kW Laser
Bead Thickness	<1mm - 15mm
Max Deposition Rate	12lb/hr*
Wire Size	0.6 - 1.6mm
Vary Bead Thickness on the Fly	Yes**
Water Cooled	Yes

4kW Power Coaxial

Laser Power (max)	4kW Laser
Bead Thickness	<1mm - 15mm
Max Deposition Rate	6lb/hr*
Wire Size	0.6 - 1.6mm
Vary Bead Thickness on the Fly	Yes**
Water Cooled	Yes

ADDere's In-house Print Services

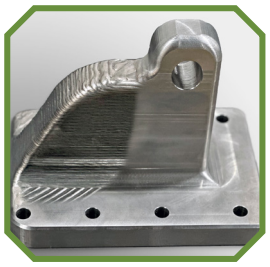
Let ADDere print your low-run and large-scale prototype parts at our **ITAR-compliant** facility using our industry-leading metal and superalloy additive manufacturing technology!

ADDere's in-house print services located in Waukesha, WI features the capacity to print large-scale metal parts of up to 1 x 1 x 2 meters with a maximum build weight of 1,000 kg and a layer height of 1-2mm.

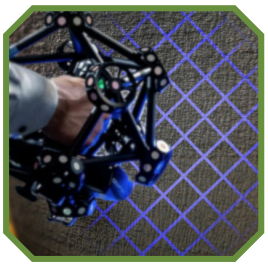
METAL ALLOYS ADDERE 3D PRINTS

- → Titanium Ti64
- → Duplex Stainless Steel
- → Stainless Steel
- → Inconel 601, 625, 718
- → Invar 36
- → Hastelloy
- → Niobium Alloy C103
- → Carbon Steel

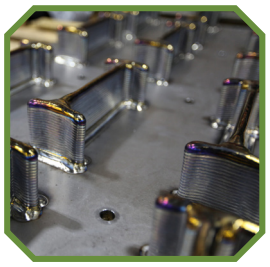
Additional Services We Offer



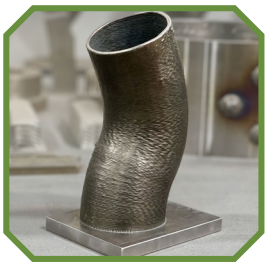
Final Part Machining



Dimensional Quality Control



Material Trials



Part Prototyping


REACH
OUT TO US
TO GET A
QUOTE!

Let ADDere print your parts today!

Get A Quote

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