MELTIO

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TOOLING & MACHINERY
COMPLETE METALWORKING SOLUTIONS
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Metal 3D Printing **Applications**

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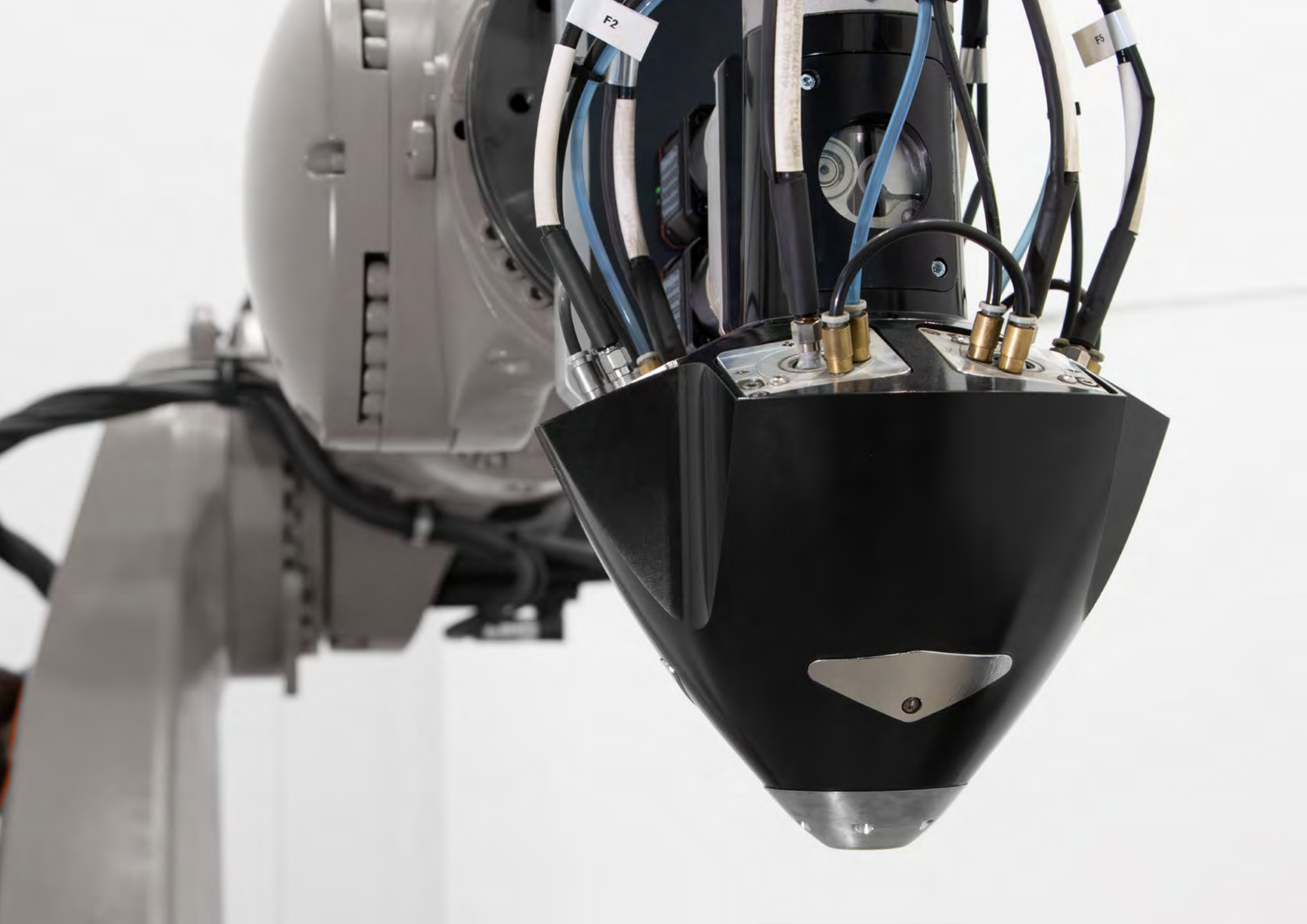
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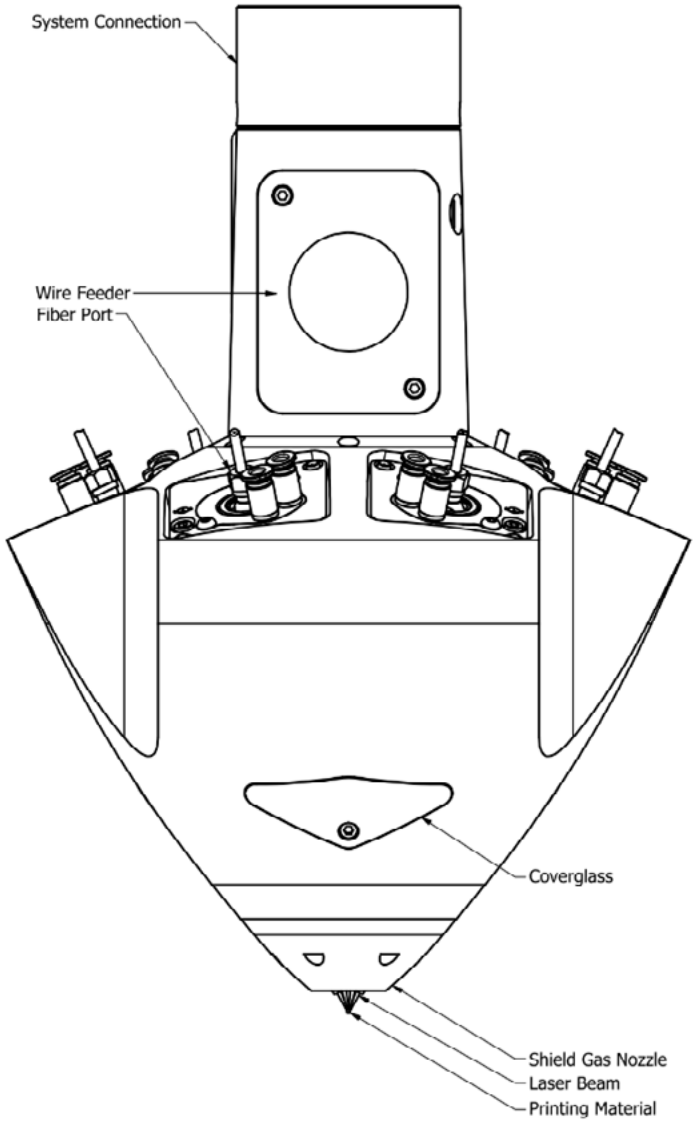
Wire-Laser Metal 3D Printing

Discover Meltio’s state-of-the-art wire-laser metal 3D printing technology either as a standalone metal 3D printer or integrated into a CNC machine or a robot arm. Our metal additive manufacturing solutions bring unprecedented possibilities to enjoy 3D printing advantages in everyday part production.

Our mission is to delight customers, partners, employees and shareholders by pioneering the development of affordable metal 3D printing systems that are reliable, safe and easy to use, continually reinforcing our status as disruptors.



Laser Metal Deposition

Multi-laser Deposition Head

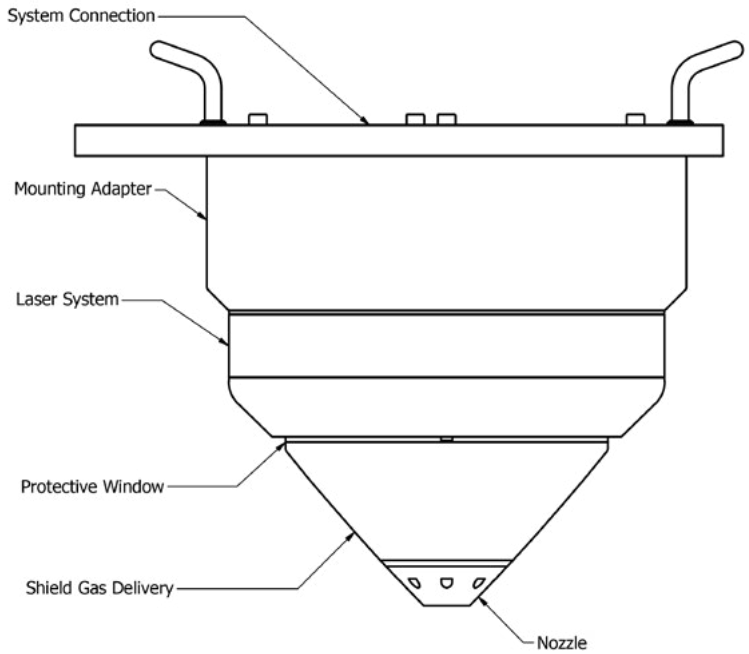
LMD is a Directed Energy Deposition (DED) process that functions by precisely stacking weld beads on top of one another.The wire feedstock is introduced into the laser-generated melt pool.

Meltio’s technology comes packaged in a compact deposition head, host of multiple lasers, capable of processing commodity welding wires independently and simultaneously.

Blue Laser

The blue laser diodes offer precise and efficient power control, thanks to enhanced absorption capabilities with most metals. This enables them to effectively process a broader range of materials with precision and reliability.

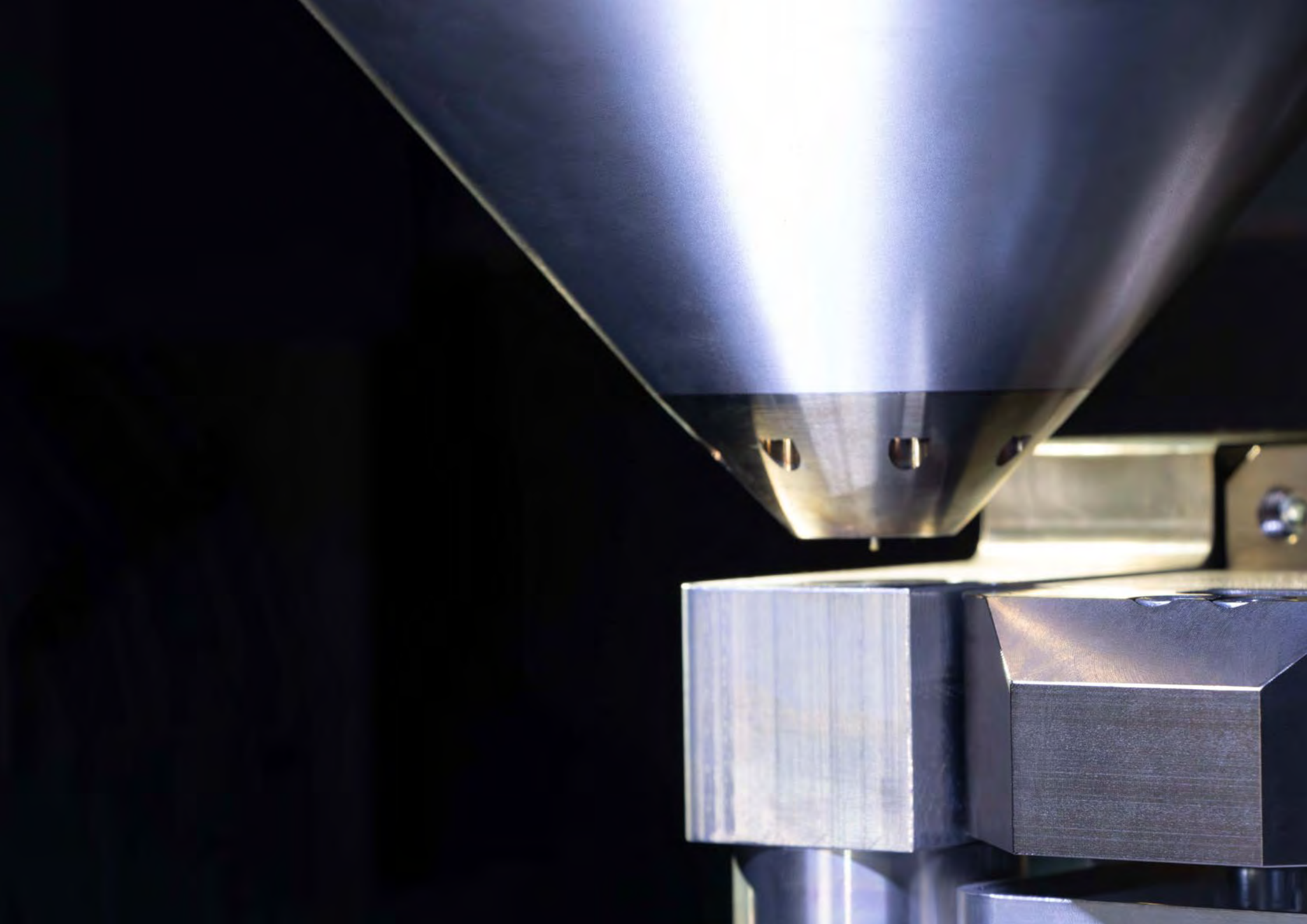
Moreover, their augmented energy delivery efficiency results in reduced electricity consumption, making the manufacturing process significantly more cost-effective.



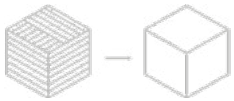
Material and Feeding System

The Meltio M600 Material and Feeding System is built to handle aluminum and copper alloys as well as a variety of other materials with ease.

Our system offers dual and quadruple wire capabilities for reliable material feeding from spools or drums weighing over 100kg.



Applications Overview



Near Net Shapes

Replacement of casting and forging near net shapes for prototyping, pilot runs and low volumes to avoid up front investment and minimum order quantities.

Cooling

Integration of conformal cooling channels for increased performance, typically used in the aerospace industry, heat exchangers, molds and dies.

Lightweighting

Typical for the aerospace and aviation industries where weight savings have a significant impact on part cost and overall system efficiency.

Repairs, Spares, and Obsolete Parts

Commonly used in mold repairs or heavy industries such as marine, rail way, mining and defense where parts are required for machinery in remote areas.

To know more

Meltio M450

Turn-key Metal 3D Printer

Designed for industry without the need for industrial infrastructure; affordable, reliable, safe and easy-to-use metal 3D printer. Ideal for small to medium size part fabrication and multi-metal 3D printing research.

The Meltio M450 allows users to produce metal parts of very high density in a single-step process on a very compact footprint.

Reliable **Safe** **Easy-to-use** **Affordable**

Technical Specifications

Dimensions (WxDxH):	560 x 600 x 1400 mm
Print Envelope (WxDxH):	145 x 168 x 390 mm
System Weight:	250 kg
Laser Type:	6 x 200W direct diode lasers
Laser Wavelength:	976 nm
Total Laser Power:	1200 W
Power Input:	208/230 V single phase or 400 V three phase

Power Consumption:	2-5 kW peak depending on selected options
Process Control:	Closed-loop, laser and wire modulation
Enclosure:	Laser-safe, sealed, controlled atmosphere
Interface:	USB, ethernet, wireless datalink
Cooling:	Active water-cooled chiller included
Wire Feedstock:	Diameter: 0.8-1.2 mm / Spool Type: BS300

Upgrades and Accessories

Hot Wire:	Programmable power supply that preheats the material to increase the deposition rate.
Dual Wire:	This option allows to 3D print two wire materials sequentially with very quick wire switches.
Laser Calibration System:	It allows users to calibrate Meltio’s multi-laser deposition head accurately and effortlessly prior to every print.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M450
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Belt Sprocket

Automotive Industry

Belt sprockets are mechanical components transferring torque from a shaft to a belt in a belt drive assembly. These components exist in a wide range of sizes and can be employed in automotive and several different industrial fields.

Size:	102 x 102 x 45 mm
Weight:	1.62 kg
System:	Meltio M450
Material:	Stainless Steel 17-4PH
Gas:	Argon
Layer Height:	1.0 mm
Print Time:	7h 40’

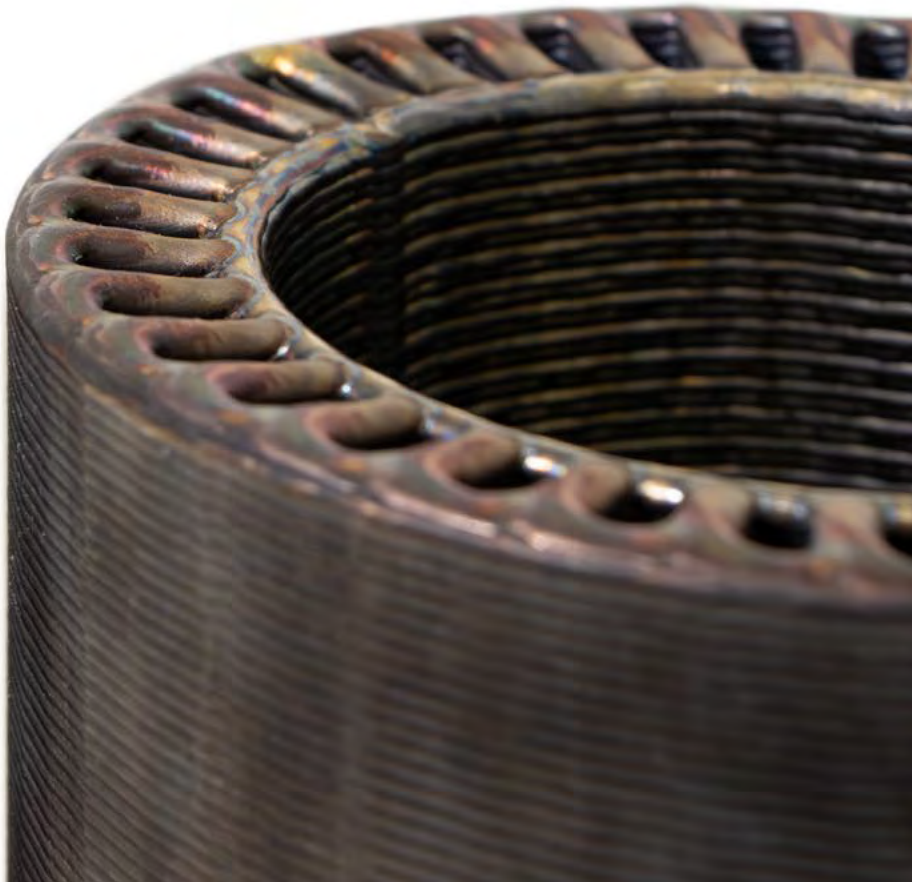
Dual Material Pipe

Energy / Oil & Gas

The double-material pipe assembly is an ideal solution for a range of applications as it effectively combines the corrosion resistance of Inconel 718 with the cost-effectiveness of SS316LSi.

The central pipe, which is responsible for transporting highly corrosive liquids, is constructed using Inconel 718, a material renowned for its outstanding resistance to corrosion. In contrast, the water jacket that surrounds the central pipe is made from the more affordable SS316LSi stainless steel. This particular stainless steel variant is perfectly suited for water cooling and provides excellent performance, reducing the reliance on Inconel by more than 66%. By utilizing this innovative double-material design, the pipe assembly achieves optimal functionality while optimizing costs.

Size:	108 x 108 x 150 mm
Weight:	Stainless Steel: 3.6 kg / Inconel 718: 0.94 kg
System:	Meltio M450
Material:	Stainless Steel 316L / Inconel 718
Gas:	Argon
Layer Height:	1.2 mm
Print Time:	16h 37’



Internally Cooled Punch

Manufacturing - Sheet Metal Forming

The part is a punch that incorporates custom-designed cooling channels, which are vital for efficient heat dissipation during operation. This showcases the advantages offered by Meltio's additive manufacturing technology, enabling the creation of intricate geometries with conformal cooling capabilities.

These cooling channels have a teardrop shape profile and have been strategically integrated along an elaborate spiral path. This well-calculated spiral layout optimizes both the cooling efficiency and the overall size of the part. As a result, the punch boasts a more compact design, while simultaneously providing a larger surface area to enhance the effectiveness of the cooling process

Size:	80 x 80 x 115 mm
Weight:	2.04 kg
System:	Meltio M450
Material:	Tool Steel H11
Gas:	Argon
Layer Height:	1.2 mm
Print Time:	8h 37'

WIRE TRADING

Nozzle

Food Sector

Introducing a cutting-edge 316-L Meltio stainless steel nozzle designed for drying lines, capable of projecting air at a scorching 400º. This innovative part is tailor-made for industrial environments, especially in the food sector.

Size:	65 x 82 x 194 mm
Weight:	1.14 kg
System:	Meltio M450
Material:	Stainless Steel 316L
Gas:	Argon
Layer Height:	0.8 mm
Print Time:	4h

HIRUDI
3D intelligence

Connecting Rod

Automotive Industry

The connecting rod provides the mechanical linkage between piston and crankshaft and must exhibit properties of high strength, low inertial mass, and uniformity of mass with the other connecting rods attached to the crankshaft.

Connecting rods are split perpendicular to their centerlines at the crank pin end for assembly of the rod onto the crankshaft. The cap and rod are aligned with a close-tolerance bushing or body-bound bolts.

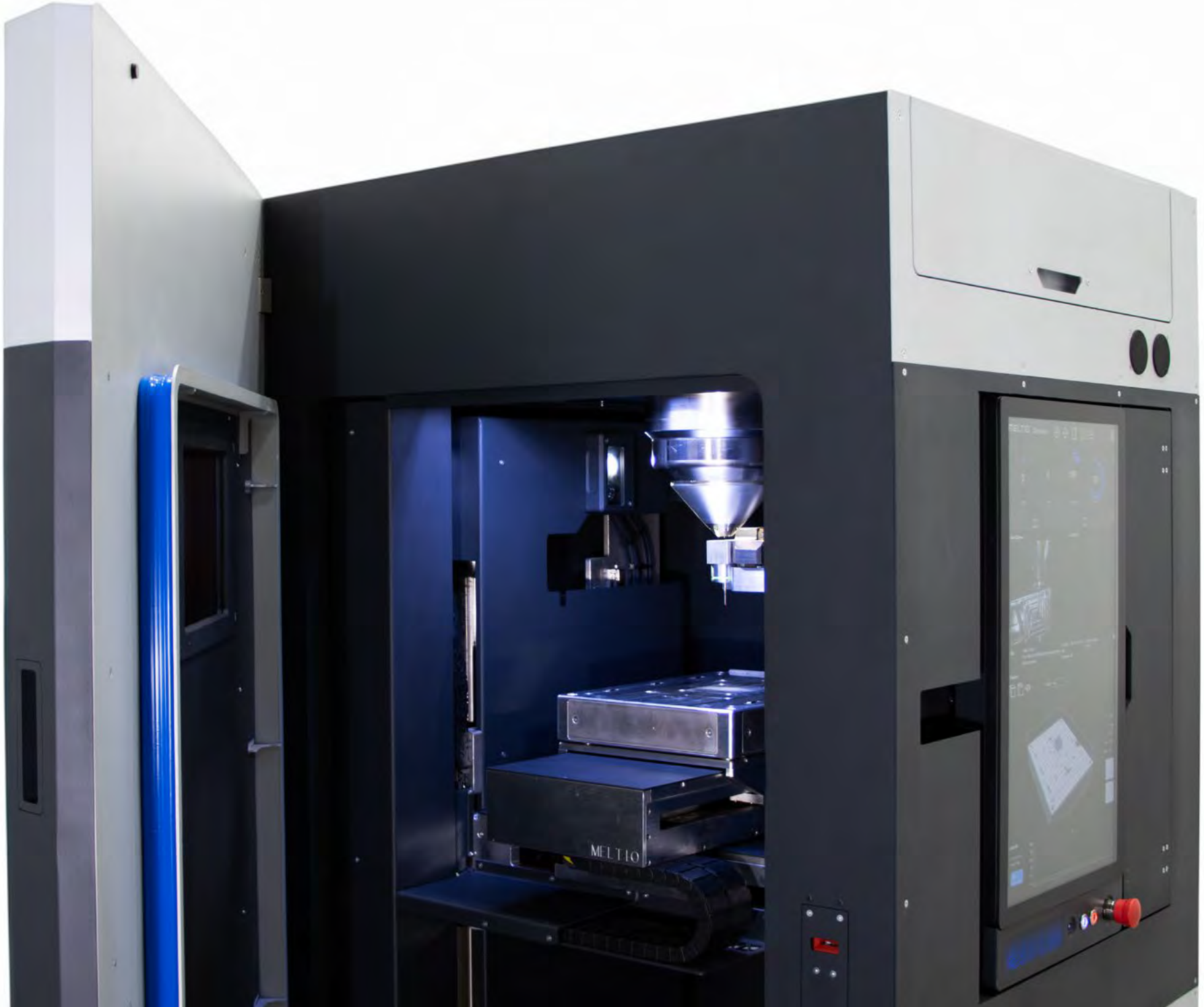
Size:	Top part: 49.64 x 156.41 x 332.82 mm Inferior part: 44.41 x 158 x 81.21 mm
Weight:	9.85 kg
System:	Meltio M450
Material:	Stainless Steel 316L
Gas:	Argon
Layer Height:	0.8 mm
Print Time:	38h 51’

Y-Pipe

Automotive Industry

A Y-pipe is a type of exhaust pipe commonly used in the exhaust system of vehicles. It is named after its Y-shaped design, which allows two exhaust pipes to merge into a single pipe. The Y-pipe is typically located after the exhaust manifold and before the catalytic converter.

Size:	137 x 137 x 276 mm
Weight:	1.3 kg
System:	Meltio M450
Material:	Stainless Steel 316L
Gas:	Argon
Layer Height:	0.5 mm
Print Time:	8h 10’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Meltio M600

Industrial Metal 3D Printer

Expand your manufacturing capabilities with Blue lasers, a large build volume, and a fully inert chamber for the best material properties. Printing is easier than ever thanks to the improved process control, advanced sensors, and live monitoring allowing you to produce parts consistently 24/7.

The Meltio M600, with its built-in 3-axis probing system and work-holding solutions, is the ideal companion for your manufacturing operations.

Production Ready **Reliable** **Easy-to-use** **Repeatability**

Technical Specifications

Dimensions (WxDxH):	1050 x 1150 x 1950 mm
Print Envelope (WxDxH):	300 x 400 x 600 mm
System Weight:	800-1000kg (depending on options)
Movement System:	Servo Motor Linear axis with Absolute encoder on all axis
Filtration System:	3 Stage Particulate and Chemical Filtration included
Environment Control:	Control O2 and Humidity level
Laser Type:	9x Direct Diode Lasers
Laser Wavelength:	450 nm (Blue)
Total Laser Power:	1000 W

Power Input:	400V Three Phase
Power Consumption:	4-6 kW Peak Depending on selected options
Process Control:	Closed Loop, Laser and wire Modulation
Touch Probe:	Automated XYZ Touch Probe integrated
Enclosure:	Laser safe, Controlled inert atmosphere
Interface:	USB, Ethernet, WiFi
Cooling:	Active water-cooled chiller included
Wire Feedstock:	Diameter: 0.8-1.2 mm / Spool Type: BS300 External wire drum ready

Upgrades and Accessories

Hot Wire:	Programmable power supply that preheats the material to increase the deposition rate
Dual / Quad Wire:	This option allows for sequential 3D Printing of up to 2 / 4 materials with very fast automatic wire switches
External Wire Drum Connection:	Connect external wire drums to the M600, allowing the use of 100 kg and 200 kg material packs
Zero Point Clamping System	Accurately and quickly couple fixture plates to the print bed of the M600 for production

Concrete 3D Printing Nozzle

Construction

3D printing is not only growing in the metal field. It’s now possible to build entire houses with accurate deposition of specifically formulated concrete mixtures. This requires advanced equipment, and the last interface between the machine and the final product is the deposition nozzle.

These concrete printers usually employ simple nozzles, prone to premature failure due to wear. A stainless steel solution can be manufactured in a few hours, guaranteeing tailored, controlled, performance over a much longer operational lifetime.

Size:	150 x 150 x 135 mm
Weight:	1.46 kg
System:	Meltio M600
Material:	Stainless Steel 316L
Gas:	Argon
Layer Height:	0.8 mm
Print Time:	9h

CEMENTOS LA CRUZ

Dual Material Combustion Chamber

Aerospace

A “combustion chamber” is the component of a rocket engine where the combustion of propellants takes place. It is the area where fuel and oxidizer are mixed and react to generate a large amount of heat and high-pressure gases. The combustion chamber is designed to safely and efficiently contain and control this reaction.

Fresh fuel is channeled between the walls of the combustion chamber to cool it down before it enters the engine to avoid overheating the chamber walls. This is a complex geometry that would never be made in a single-step process, with its features and complexity enacted by the use of highly dissimilar materials: Ni-718 for structural strength and CuCrZr copper alloy for heat dissipation.

Size:	131 x 200 x 176 mm
Weight:	6.4 kg
System:	Meltio M600
Material:	Inconel 718 + Copper
Gas:	Argon
Layer Height:	1.2 mm
Print Time:	47h 23’

Engine Bracket

Aerospace

This is an engine bracket, topologically optimized to employ material only where it is required by the static and dynamic loads the part will be subject to. This translates into more efficient manufacturing and more efficient operation due to the lighter, yet highly performing, structure.

Size:	153 x 345 x 275 mm
Weight:	18.6 kg
System:	Meltio M600
Material:	Stainless Steel 316L
Gas:	Argon
Layer Height:	1.2 mm
Print Time:	48h

VAMK etteplan

Large U Joint

Railway / Industrial / Automotive

A universal joint coupling connecting rigid shafts whose axes are at an angle to each other. This is a common component in a variety of machines, both in transportation and industrial environments. Large universal joints may require long lead time through traditional supply chains, especially if requiring non-standard dimensions.

Meltio Additive Manufacturing solutions can produce similar components with minimal post-processing required to finish them.

Size:	200 x 255 x 400 mm
Weight:	95 kg
System:	Meltio M600
Material:	Stainless Steel 316L
Gas:	Argon
Layer Height:	1.2 mm
Print Time:	200h

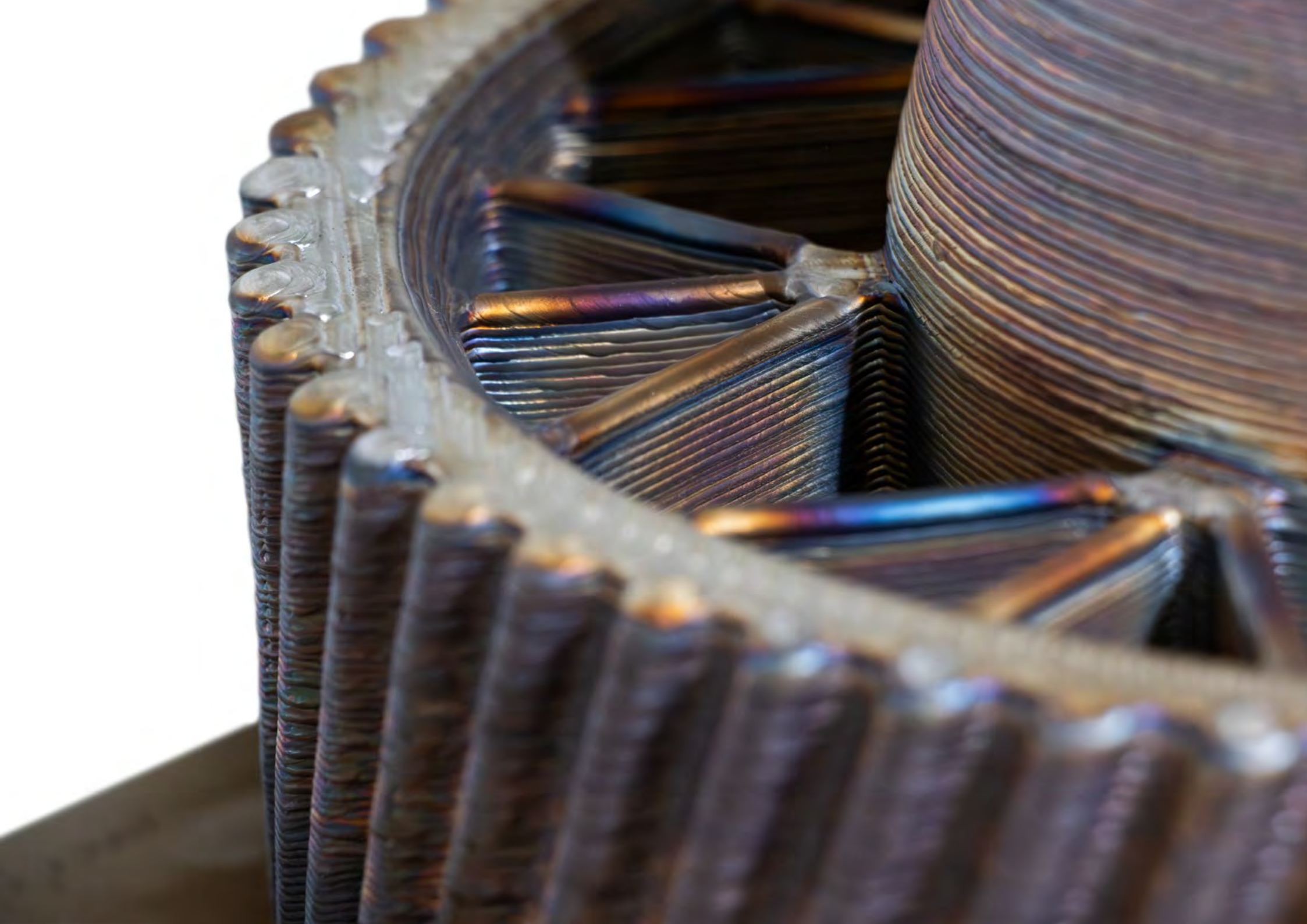
Gear

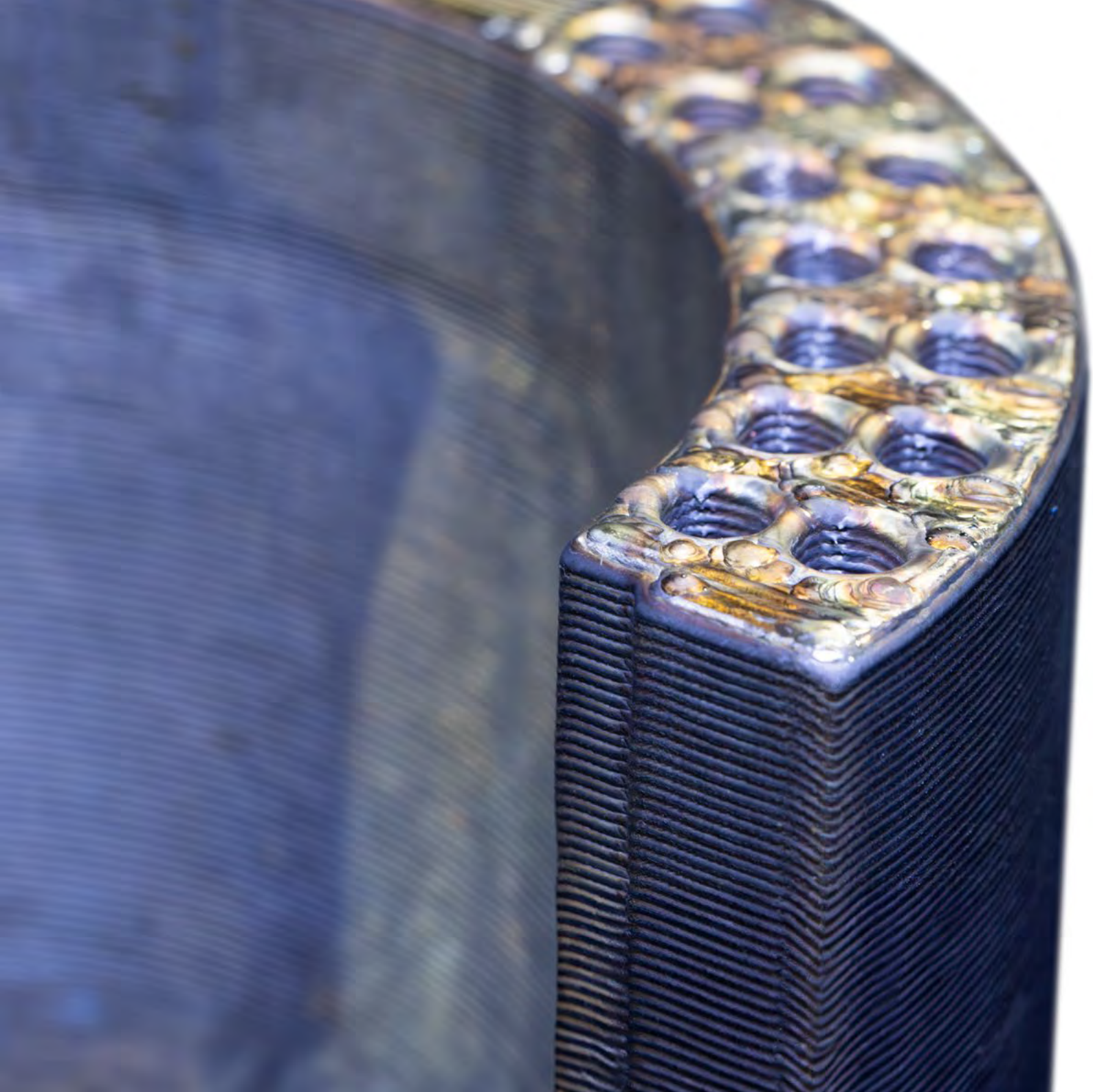
Industrial

Gear transmission systems are extensively employed in numerous industries, including automotive, wind turbines, mining, marine, and other industrial sectors.

While gears are largely manufactured by subtractive means, the use of Meltio Additive Manufacturing solutions allows the consolidation of other components in the same part and the implementation of material reduction strategies.

Size:	260 mm Ø x 500 mm
Weight:	25 kg
System:	Meltio M600
Material:	Stainless Steel 316L
Gas:	Argon
Layer Height:	1.2 mm
Print Time:	15h





Large Glass Mold

Manufacturing Industry

Glass molds are used in the glass industry for shaping molten glass into various forms such as bottles, containers, and glassware. The large glass mold, being a crucial part of the mold assembly, plays a significant role in defining the shape and structure of the final glass product.

The monolithic structure offers fully functional cooling ducts, straight off the printing build plate and only requires finishing of the glass shaping surfaces.

Size:	250 x 275 x 475 mm
Weight:	41.16 kg
System:	Meltio M600
Material:	Stainless Steel 316L
Gas:	Argon
Layer Height:	1.2 mm
Print Time:	96h 07’

Meltio Engine Robot Integration

Large-scale Metal 3D Printing

Turn a robot arm into a metal 3D printing system with no inherent size constraints. It is the perfect platform for large and complex 3D printing, repair, cladding and feature addition.

The Meltio Engine integrates with any robot arm manufacturer and interface on the market.

Large-Scale **Geometry Freedom** **Part Repair** **Cladding**

Technical Specifications

Dimensions (WxDxH):	390 x 700 x 1025 mm
Print Envelope (WxDxH):	Depending on the reach of the robot arm
System Weight:	142 kg
Laser Type:	6 x 200W direct diode lasers
Laser Wavelength:	976 nm
Total Laser Power:	1200 W
Power Input:	208/230 V single phase or 400 V three phase
Power Consumption:	2-5 kW peak depending on selected options

Power Consumption:	2-5 kW peak depending on selected options
Process Control:	Closed-loop, laser and wire modulation
Cooling:	Active water-cooled chiller included
Printhead Size (WxDxH):	202 x 297 x 784 mm
Printhead Weight:	15.5 kg
Wire Feedstock:	Diameter: 0.8-1.2 mm / Spool Type: BS300 or wire drums
Software:	Meltio Space Included

Upgrades and Accessories

Hot Wire:	Programmable power supply that preheats the material to increase the deposition rate.
Dual Wire:	This option allows to 3D print two wire materials sequentially with very quick wire switches.
Laser Calibration System:	It allows users to calibrate Meltio’s multi-laser deposition head accurately and effortlessly prior to every print.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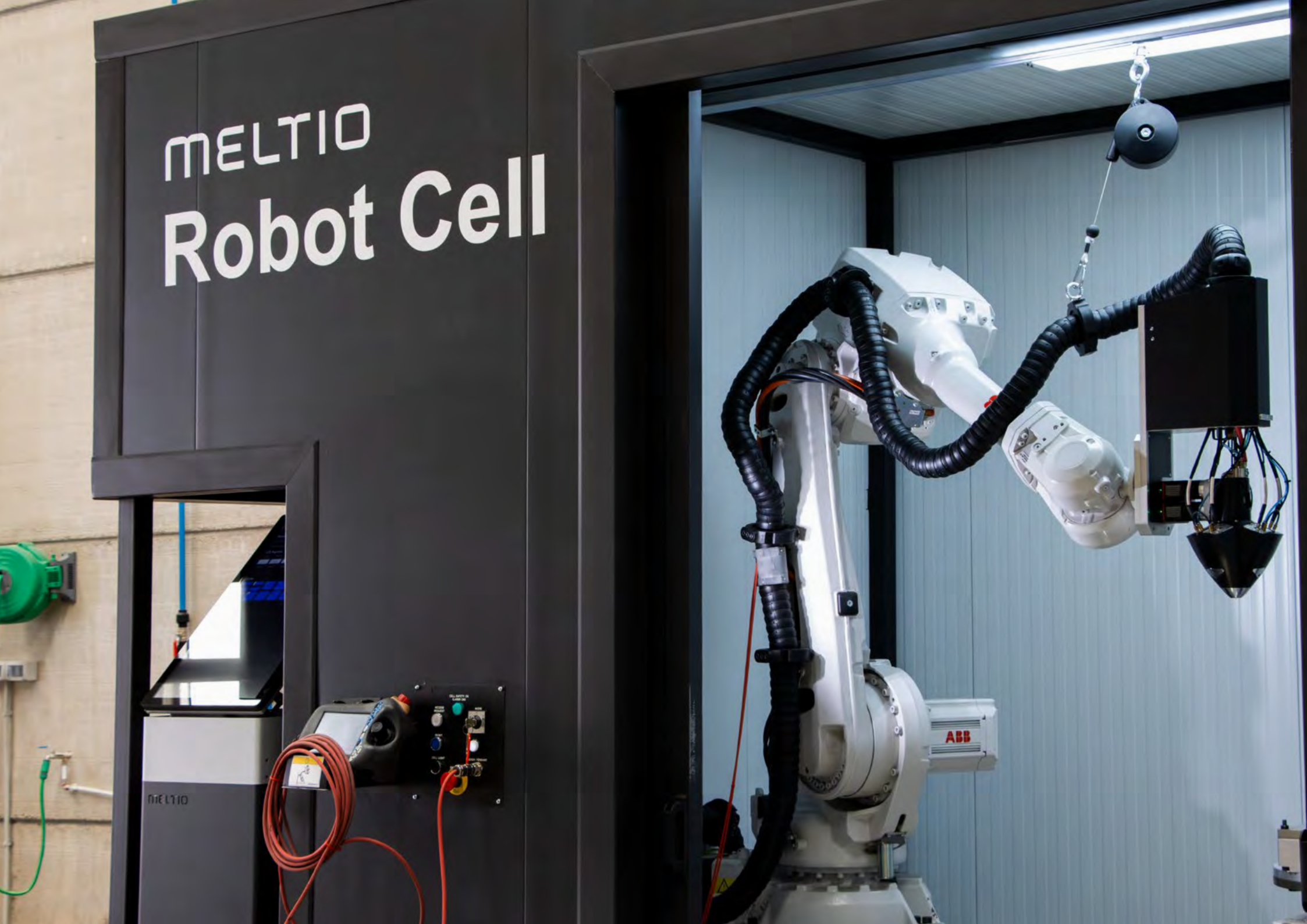
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Robot Cell
ABB

Meltio Engine Robot Cell

Plug-and-play Solution for Robot Integration

An affordable turn-key solution for the Meltio Engine Robot Integration. It is designed to provide industries with a secure and efficient solution for manufacturing metal 3D printed parts.

The Meltio Engine Robot Cell is the most versatile & capable solution for 3D printing, repair, cladding, and feature addition.

Plug-and-Play Installation **Best Components** **Safe, Tested and Certified** **Focus on Printing**

Technical Specifications

Dimensions (LxWxH):	4.050 x 2.350 x 3.000 mm Indoor use only
Print Envelope:	1 meter diameter printing volume with continuous positioner axes interpolation. Actively Cooled 300x400 mm Build Platform
System Weight:	4.000 kg
Laser Type:	Meltio Engine Robot Integrated and Tested
Movement System:	6- Axis Robot Arm & 2-Axis Workpiece Positioner
Platform:	Structural Steel with Laser-safe Class 1 enclosure with CE certification. All equipment anchored to the platform
Integration:	Unified Control Panel, 4k WebCam monitoring & Live Timeline of sensors and 3D model based on reading TCP positions from robot
Slicing software:	Meltio Space one year subscription included. Pre-defined Print profiles and slicing strategies. Focused on ease of use
Power Input:	Three phase 400V power supply, 5 poles (3W+N+PE) 63 A, 24kw peak power
Required Inputs:	Inert Argon Gas supply between 2 to 5 bar. (Meltio offers an optional Gas Regulator) & Internet Lan cable connection

Upgrades and Accessories

Hot Wire:	Programmable power supply that preheats the material to increase the deposition rate.
Dual Wire:	This option allows to 3D print two wire materials sequentially with very quick wire switches.
Laser Calibration System:	It allows users to calibrate Meltio’s multi-laser deposition head accurately and effortlessly prior to every print.

High Performance Exhaust Header

Automotive

Motorsports require that each component of the race vehicle performs at its maximum potential. This requires designing solutions that may be complex to manufacture. The challenges are even higher when the goal is retrofitting an existing, compact, car with components multiplying its performance threefold or more.
This complex exhaust header was born as a mix of high tech subtractive manufacturing, coupled with metal forming, all joined together by skilled manual craftsmanship. Dozens of separate components are now consolidated to just two.

Size:	160 x 326 x 190 mm
Weight:	5.95 kg
System:	Meltio Engine Robot Integration
Material:	Stainless Steel 316L
Gas:	Argon
Layer Height:	0.6 mm
Print Time:	19h 05’

DMZ ENGINEERING

Belt Conveyor Support

Food Industry

This optimized conveyor support structure is used by an industrial bread baking facility. Its unconventional design offers assembly consolidation from six parts to be manually welded, to just to one, with 60% less material and 50% weight reduction. This also translates in moving from 5 production steps to 1 and having the capability of running an automated process 24/7.

The design is also stronger than the original and adds functional improvement, while minimizing the number of required raw materials, for four down to just the welding wire.

Size:	130 x 903 x 855 mm
Weight:	5 kg
System:	Meltio Engine Robot Integration
Material:	Stainless Steel 316L
Gas:	Argon
Layer Height:	Solid Base: 1.2 mm / Rest part: 0.6 mm
Print Time:	28h 15’

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Dual Wire Beam

Architecture

The MMTO (Multi-Metal Topologically Optimised) Beam is an innovative structural part designed to reduce mass without sacrificing integrity. It uses mild steel and tool steel in varying proportions, allowing mass reductions of up to 80%.

The goal is to minimise embodied carbon, with optimisations ranging from 90% to 10% mass reduction. From a 20% reduction, the beams are solid and continuous. Compared to solid steel I-beams, the MMTO Beam can reduce embodied carbon by approximately 75% with 80% reduced mass.

Size:	960 x 100 x 55 mm
Weight:	7.21 kg
System:	Meltio Engine Robot Integration
Material:	ToolSteel H-11 + MildSteel ER70S
Gas:	Argon
Layer Height:	1 mm
Print Time:	67h 21’

The Bartlett School of Architecture

Screw Compressor

Mining / Chemical / Petrochemical / Food

A female steel screw compressor is a type of screw compressor used in various industrial applications such as mining, chemical, petrochemical, food and beverage industries. This compressor is highly efficient and consists of two interlocking screws that rotate in opposite directions inside a casing. One of the screws has a female shape and the other has a male shape, allowing the two screws to move in a rotating action, pushing and compressing the air or gas that is between them towards the compressor outlet.

Screw compressors are often made of stainless steel due to its high strength and durability and are commonly used for applications that require high-pressure compressed air or gas flow.

Size:	75 x 75 x 230 mm cladded
Weight:	6.6 kg
System:	Meltio Engine Robot Integration
Material:	Stainless Steel 316L
Gas:	Argon
Layer Height:	1 mm
Print Time:	21h 16’

Meltio Engine CNC Integration

Hybrid Manufacturing Integration

The most affordable hybrid manufacturing solution, fitting almost any CNC machine on the market. Enable metal 3D printing and machining of complex geometries in a single process step.

The Meltio Engine is the ideal CNC complement for near-net shape manufacturing, repair, and feature addition.

Hybrid **Retrofitting** **Geometry Freedom** **Part Repair**

Technical Specifications

Dimensions (WxDxH):	390 x 700 x 1025 mm
Print Envelope (WxDxH):	Depending on the integration
System Weight:	142 kg
Laser Type:	6 x 200W direct diode lasers
Laser Wavelength:	976 nm
Total Laser Power:	1200 W
Power Input:	208/230 V single phase or 400 V three phase

Power Consumption:	2-5 kW peak depending on selected options
Process Control:	Closed-loop, laser and wire modulation
Cooling:	Active water-cooled chiller included
Printhead Retracted Size (WxDxH):	255 x 320 x 872 mm
Printhead Unretracted Size (WxDH):	255 x 320 x 1045 mm
Printhead Weight:	46.5 kg
Wire Feedstock:	Diameter: 0.8-1.2 mm / Spool Type: BS300 or wire drums

Upgrades and Accessories

Dual Wire:	This option allows to 3D print two wire materials sequentially with very quick wire switches.
Laser Calibration System:	It allows users to calibrate Meltio’s multi-laser deposition head accurately and effortlessly prior to every print.


L 1600
AXES
HAZARDS
POWERED BY
MELTIO
LAGUN
LAGUN
MAHER HOLDING
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Turbine Blade Repair

Energy / Oil & Gas

Gas Turbine Blades are high-value components with a limited operational life, within this period cycles of refurbishment are required to ensure that the parts keep offering the optimal performance. One crucial step of these repair cycles is the rebuilding of the blade tip.

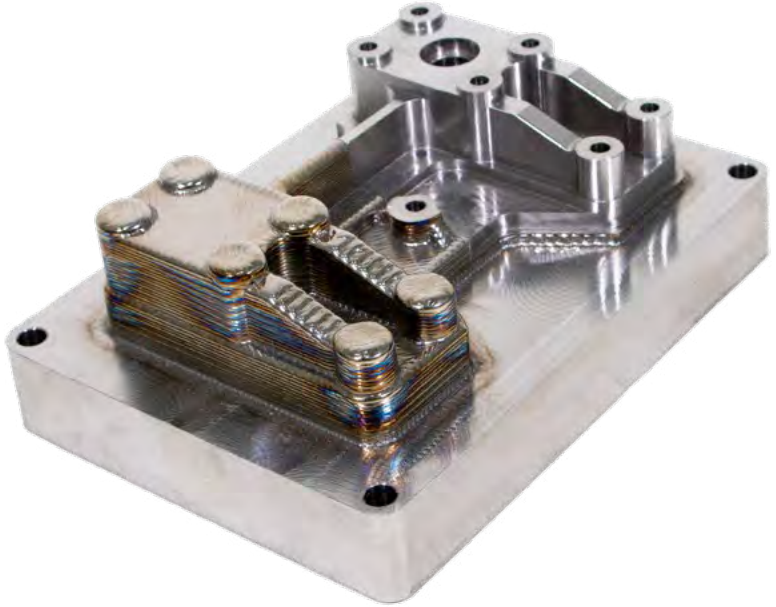
Size:	65 x 29 x 6 mm
Weight:	15 g
System:	Meltio Engine CNC Integration
Material:	Nickel 625
Gas:	Argon
Layer Height:	0.8 mm
Print Time:	6’ 16‘’

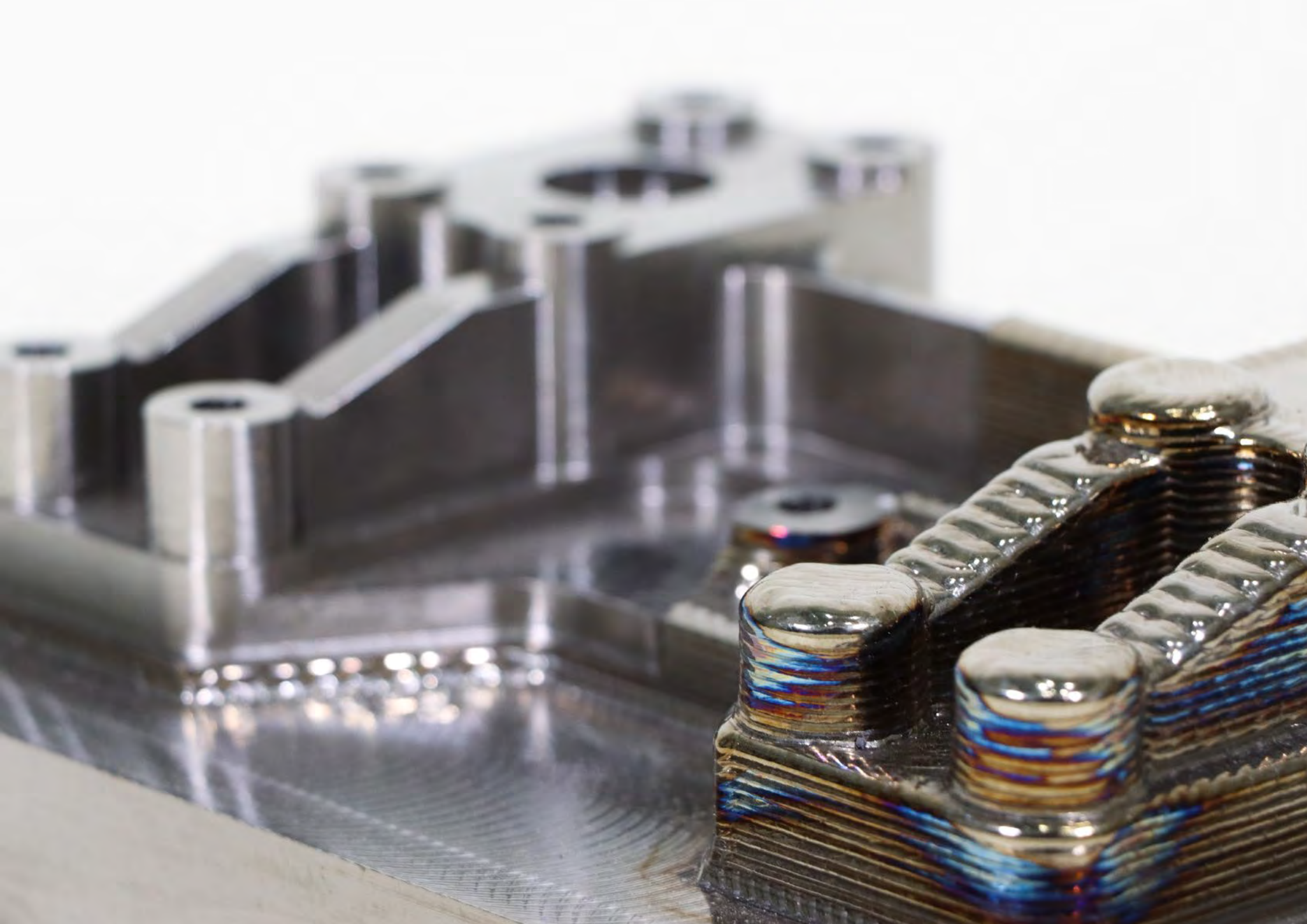
Aircraft Bracket

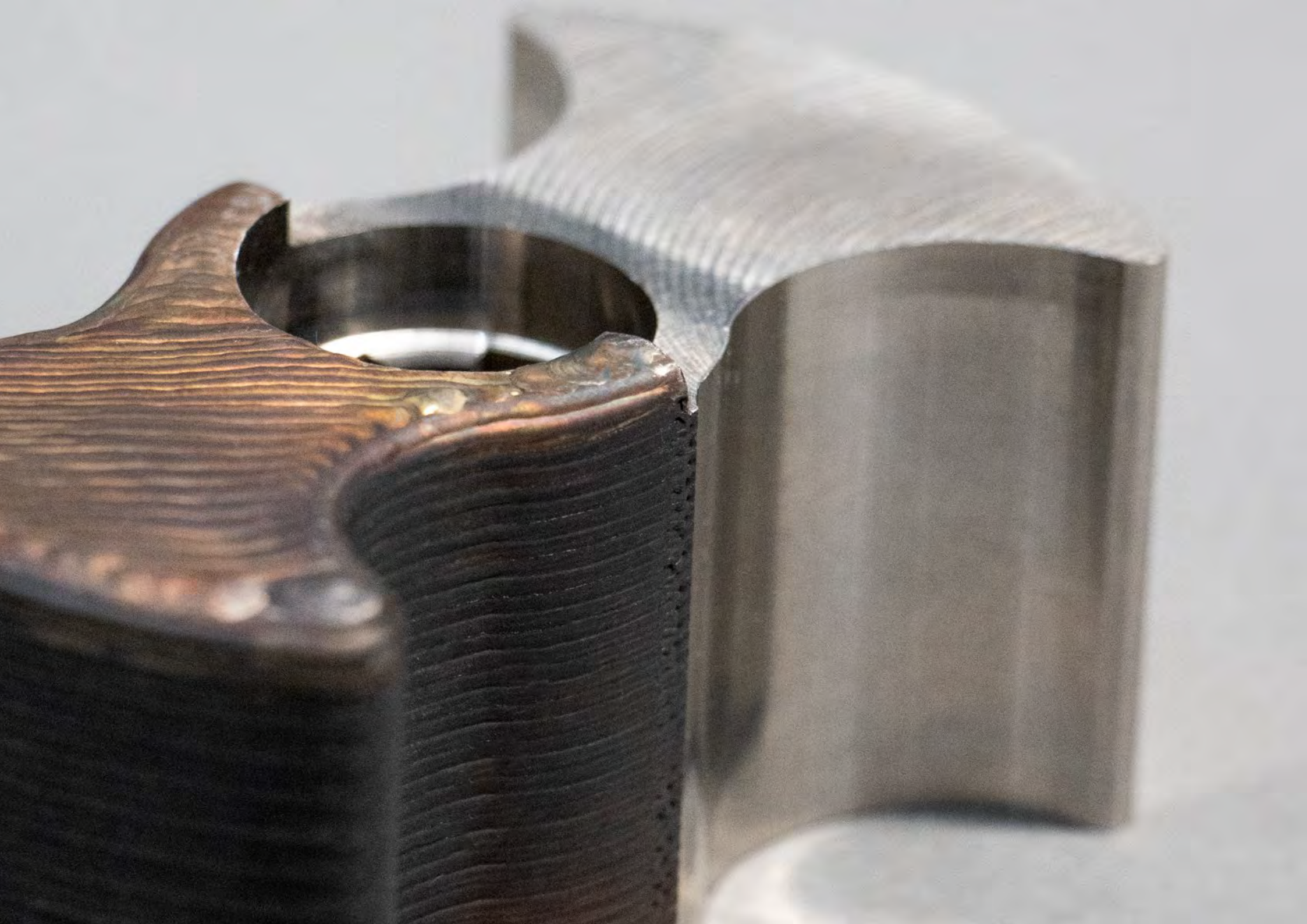
Aircarft Industry

The brackets are fundamentally supported structures that are used to attach two different components while supporting one over the other. In an aircraft, these brackets are used on a wide range of applications, such as landing gears, fuselage airframe assembly, wings assembly, engine mounts, fuel tanks, and electrical wire installations.

Size:	110 x 161 x 35 mm
Weight:	1.50 kg
System:	Meltio Engine CNC Integration
Material:	Titanium 64
Gas:	Argon
Layer Height:	1.2 mm
Print Time:	13h 33’







Rotors

Manufacturing

Rotors play a critical role in the efficient operation of various industrial equipment, including pumps, compressors, engines, turbines, and mixers. Positive displacement pumps, which are vital in industries like food, chemical, pharmaceutical, oil and gas, and water treatment, extensively utilize rotors. The type of rotor employed in these pumps is determined by the specific requirements of each industry.

There are several prevalent rotor types in industrial settings, including trilobular, single-wing, bi-winged, and helical rotors.

Size:	94 x 56 x 45 mm
Weight:	1.27 kg
System:	Meltio Engine CNC Integration
Material:	Stainless Steel 316L
Gas:	Argon
Layer Height:	1.2 mm
Print Time:	6h 25’

Semi-Open Impeller

Chemical Industry

The semi-open impeller is the main rotating component in centrifugal pumps. Semi-open impellers have a back-wall shroud that adds mechanical strength to the vanes, whilst remaining open on the other side. They are somewhat of a middle ground between open and closed impellers in terms of efficiency and NPSHr, making them suited to medium sized pumps with a small amount of soft solids.

Size:	73 x 48 x 17 mm
Weight:	Stainless Steel 316L: 1.46 kg + Nickel 625: 0.1 kg
System:	Meltio Engine CNC Integration
Material:	Stainless Steel 316L + Nickel 625
Gas:	Argon
Layer Height:	1 mm
Print Time:	10h

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