

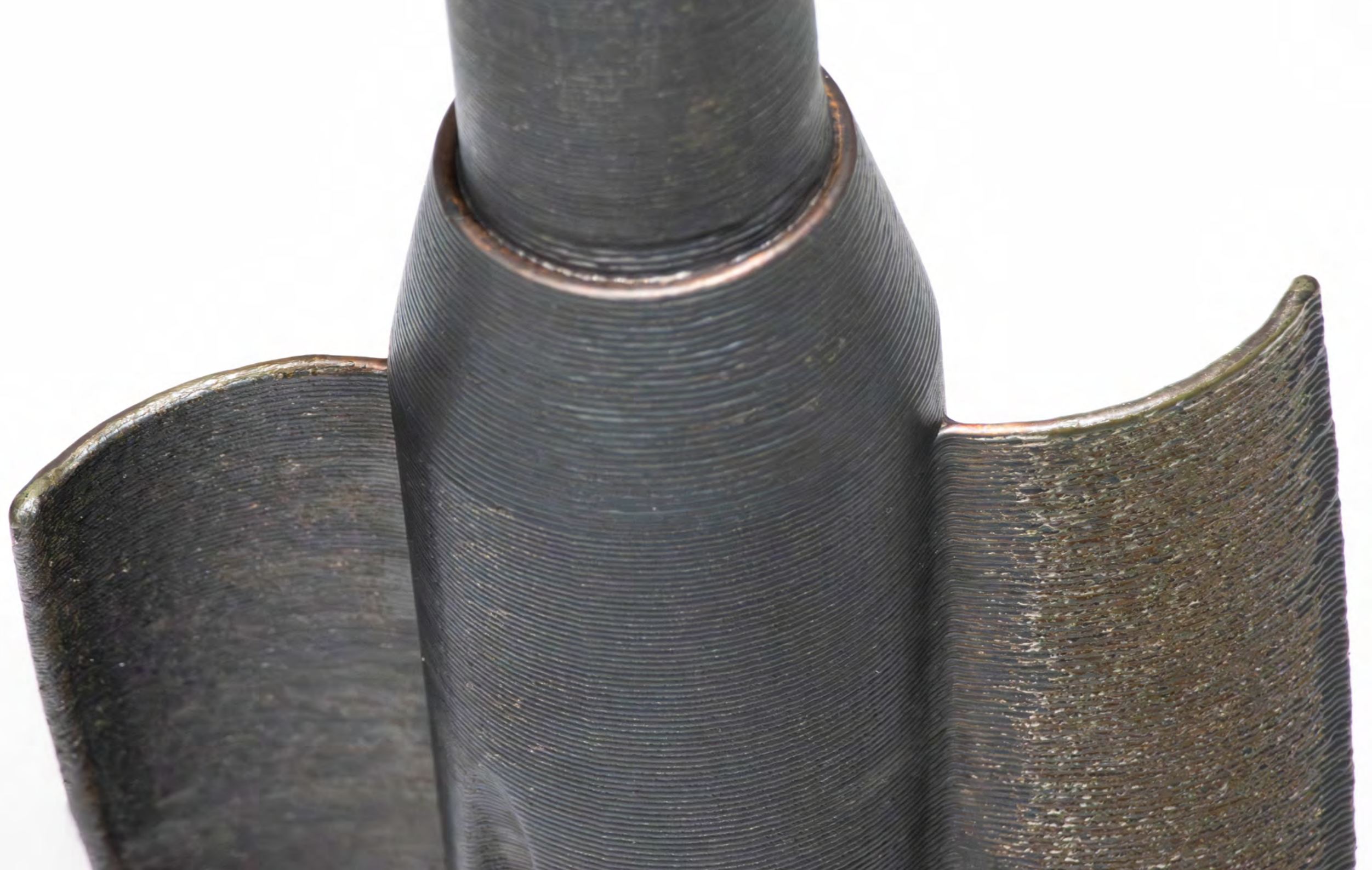
MELTIO

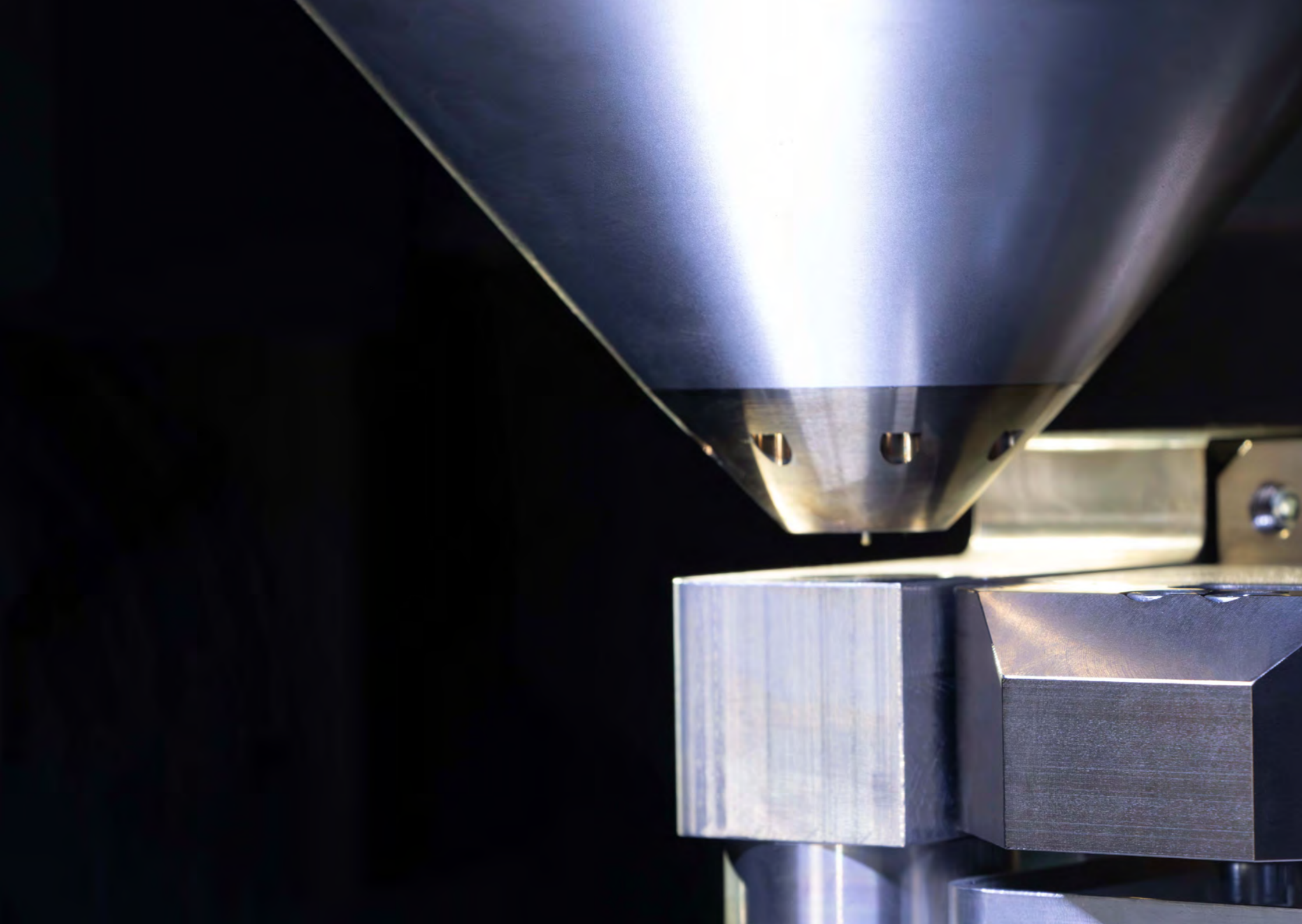
Metal 3D Printing  
Applications



# Table of Contents

Meltio's Technology	3
Applications Overview	5
Meltio M600	7
Meltio M600 Applications	9
Meltio Engine CNC Integration	21
Meltio Engine CNC Int. Applications	23
Meltio Engine Robot Integration	31
Meltio Robot Cell	33
Meltio Engine Robot Int. Applications	35





## Blue Laser

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### 1. Blue light

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450 nm light improves energy absorption and printing efficiency across the metal material spectrum and opens new material possibilities.

### 2. Hotwire compatible

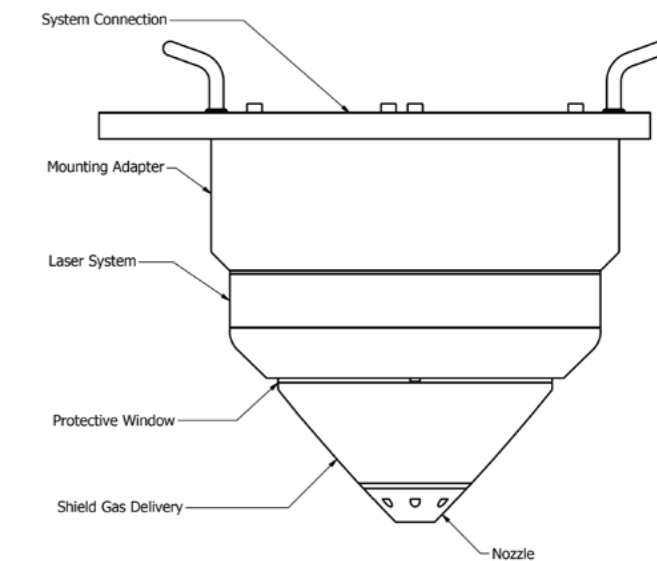
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The deposition Head is designed for use with an optional hotwire supply, enabling increased deposition rates and expanding the range of materials that can be processed.

### 3. No calibration

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The new Head eliminates the need for calibration between material changes and comes factory-aligned, ensuring maximum printing repeatability and minimal maintenance.



## Material and Feeding System

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### 1. Aluminum and Copper Ready

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The Meltio M600 is compatible with steel, carbon steel, nickel, titanium, aluminum and copper based alloys.

### 3. Wire Drum Ready

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The wire drum connector allows for a reliable and industrial feeding system for material spools of +100kg.

### 2. Dual and Quadruple Wire

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Options for printing with up to four different materials in the same print sequentially with the reliability of a single wire process.

### 4. Hot Wire

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Programmable power supply that preheats the material to increase the deposition rate.

# Applications Overview

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## Near Net Shapes

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



## Lightweighting

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



## Cooling

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



## Repairs, Spares, and Obsolete Parts

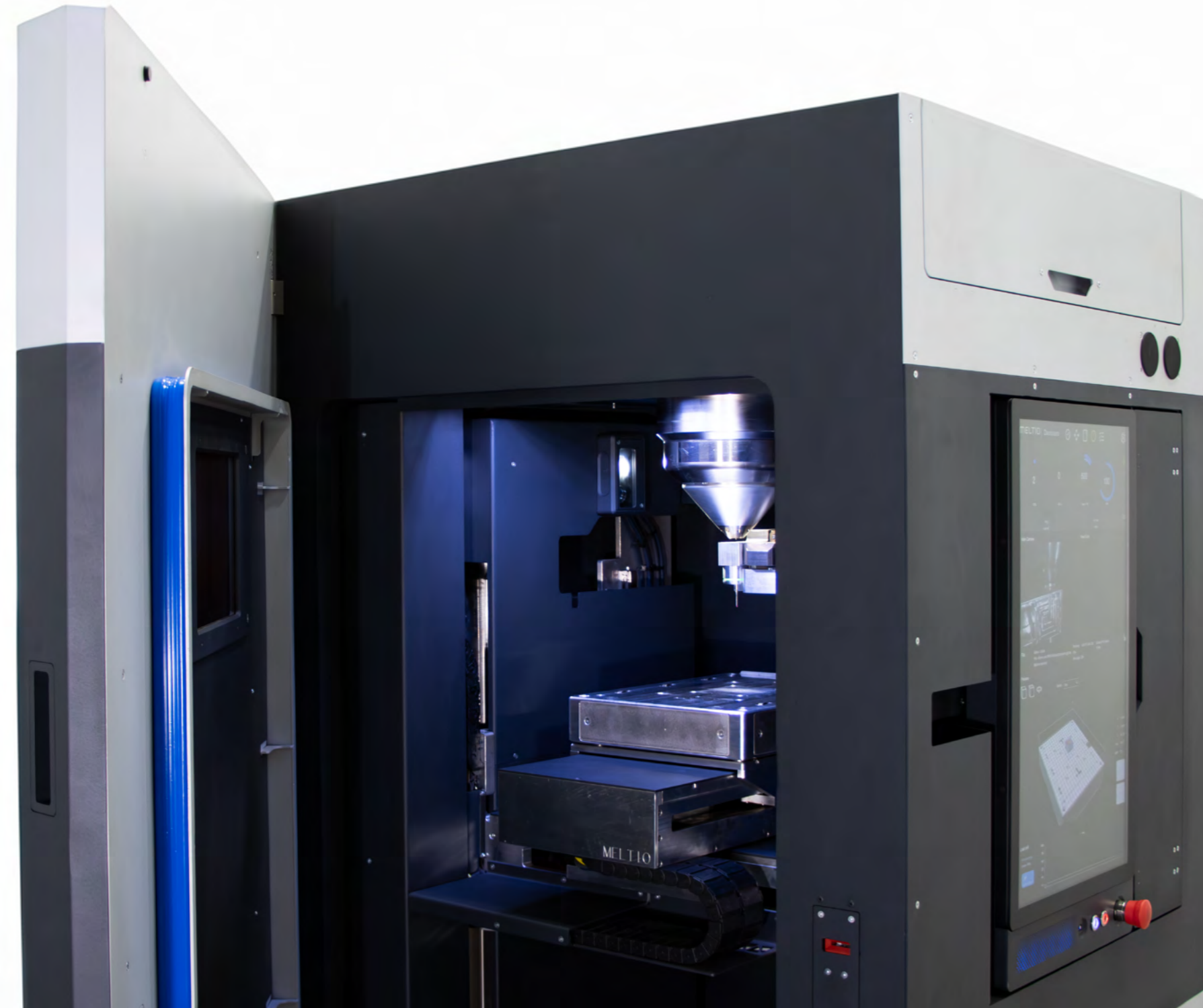
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Commonly used in mold repairs or heavy industries such as marine, rail way, mining and defense where parts are required for machinery in remote areas.



To know more



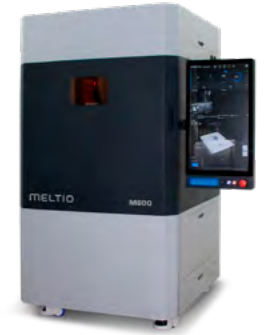


# Meltio M600

## 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**

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

<b>Power Input:</b>	380-415 V Three-phase + N + PE 200-240 V Three-phase +PE
<b>Power Consumption:</b>	4-6 kW typical consumption, 12 kW Max
<b>Process Control:</b>	Closed Loop, Laser and Wire Modulation
<b>Touch Probe:</b>	Automated XYZ Touch Probe integrated
<b>Enclosure:</b>	Laser safe, Controlled inert atmosphere
<b>Interface:</b>	USB, Ethernet
<b>Cooling:</b>	Active water-cooled chiller included
<b>Wire Feedstock:</b>	Diameter: 0.8-1.2 mm / Spool Type: BS300 External wire drum ready

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

# Concrete 3D Printing Nozzle

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## 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.

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



# Dual Material Combustion Chamber

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## 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.

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



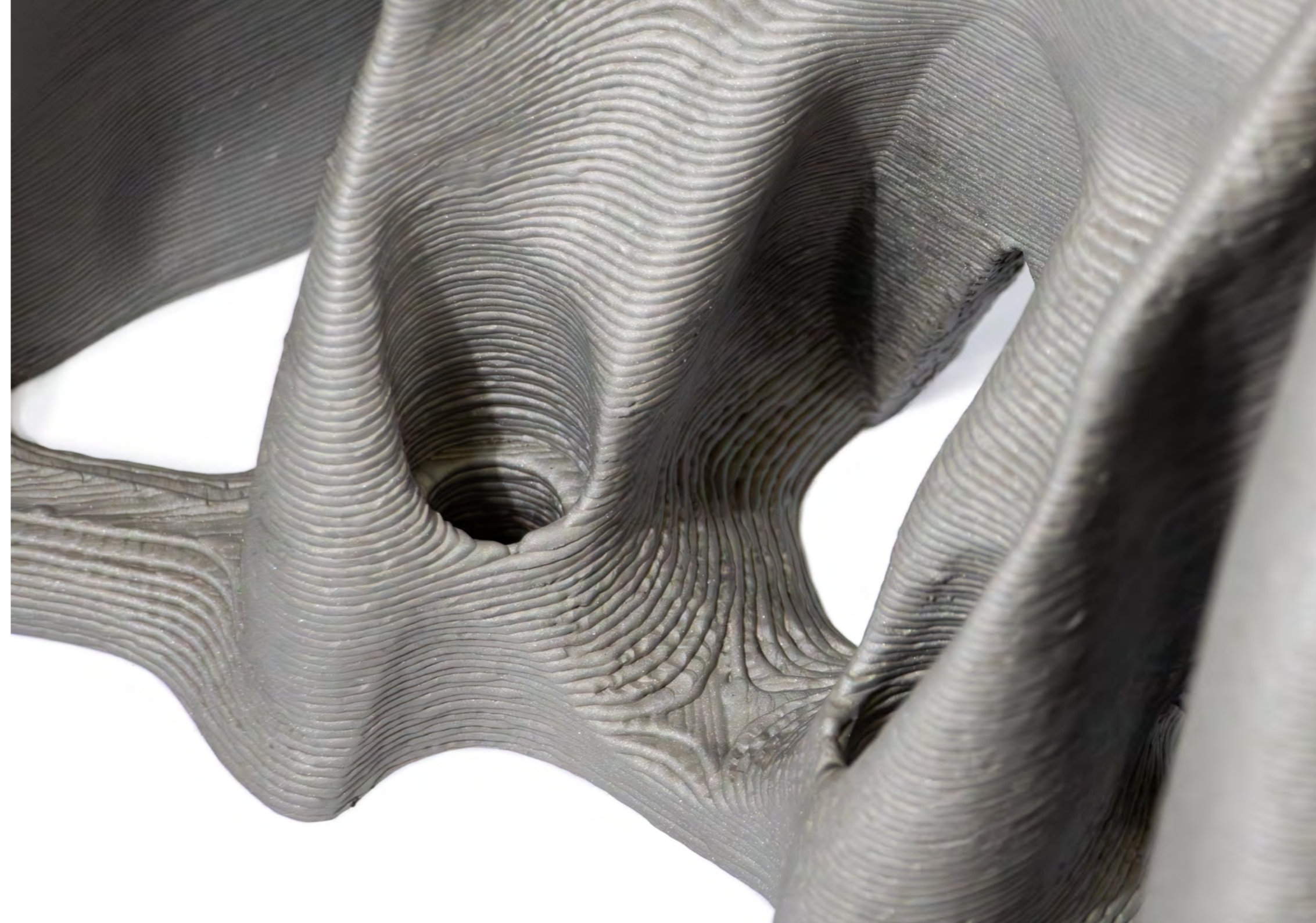
# Engine Bracket

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## 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.

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







## Large U Joint

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### 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.

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



# Gear

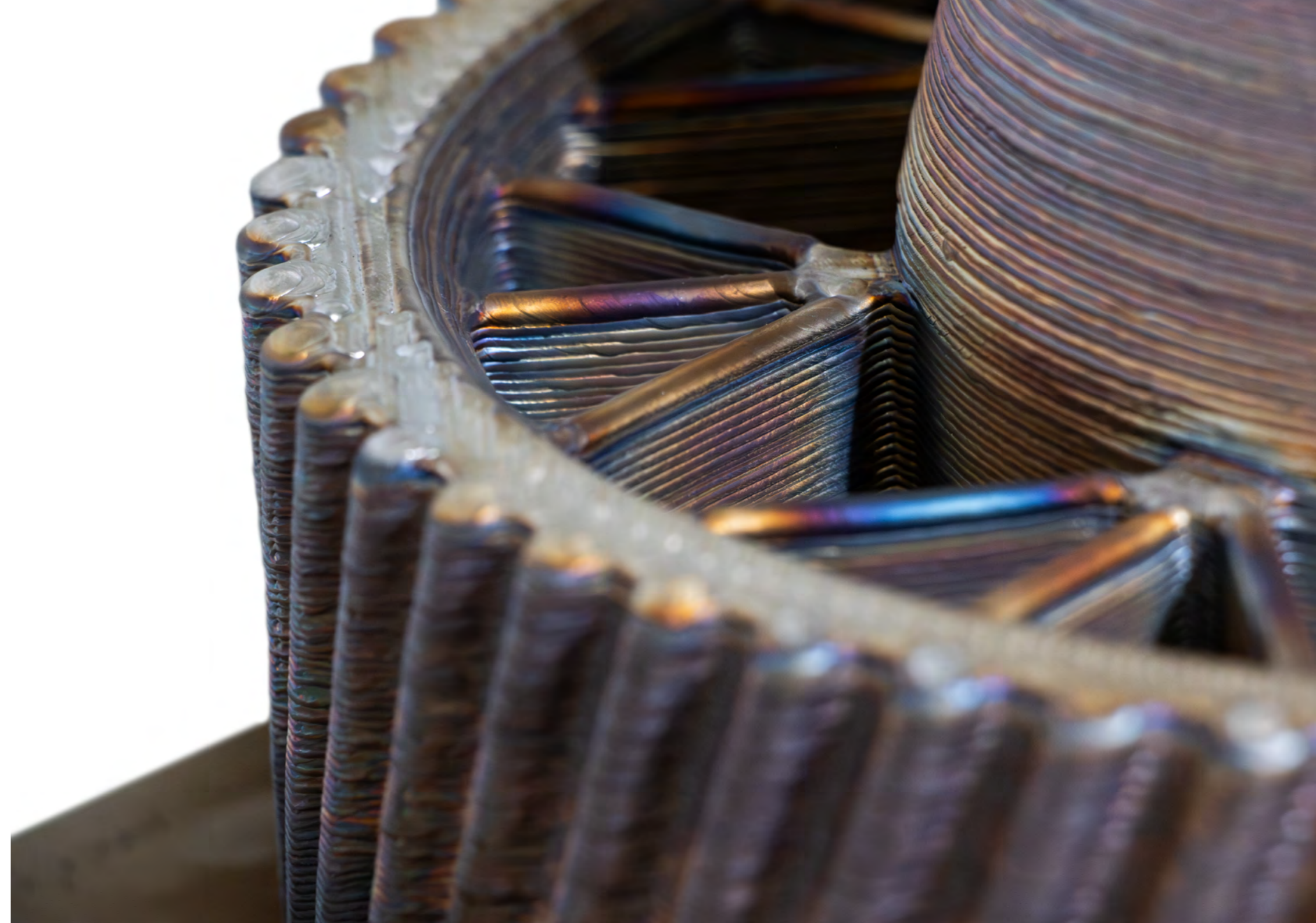
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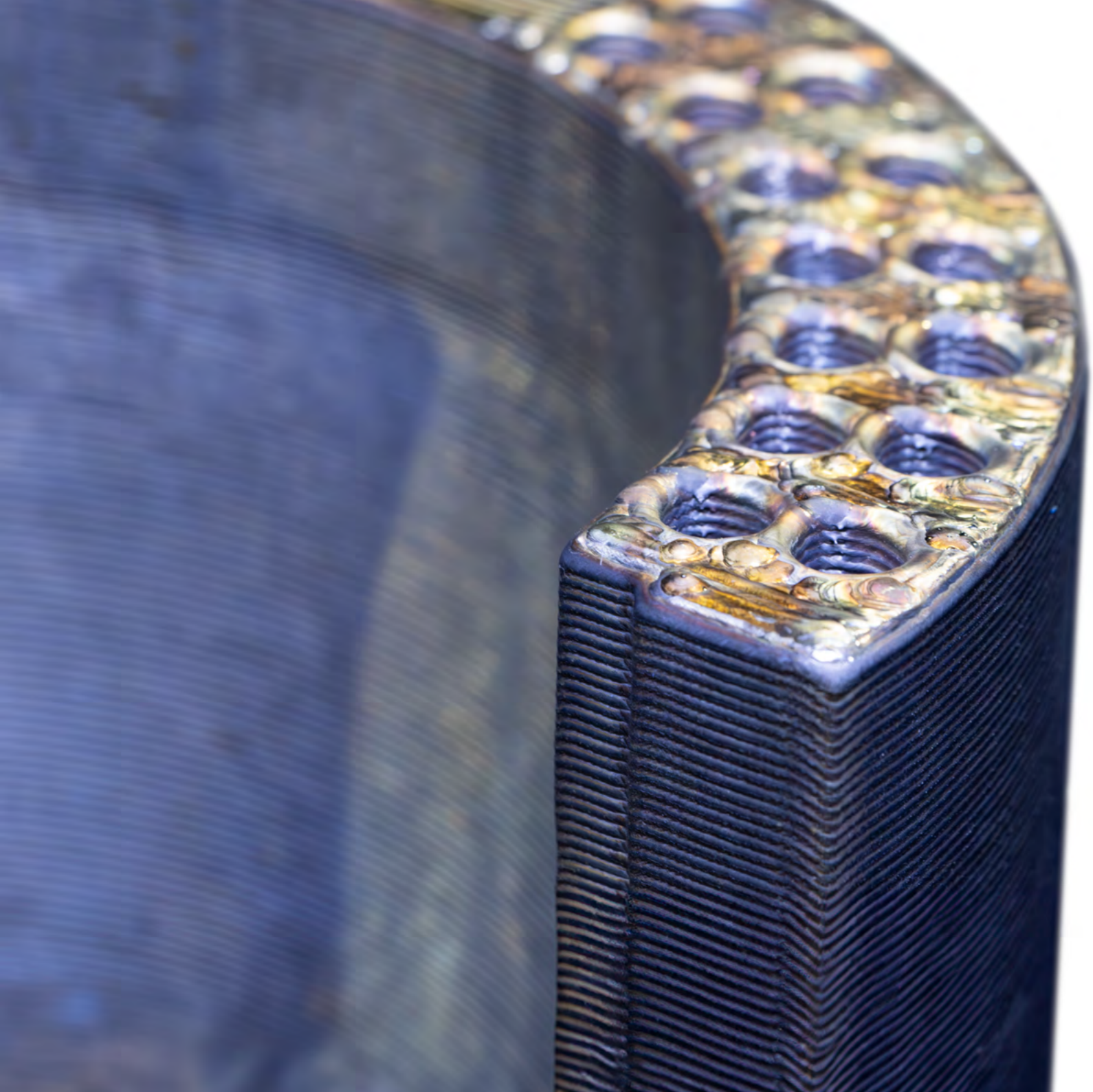
## Industrial

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.

<b>Size:</b>	260 mm Ø x 500 mm
<b>Weight:</b>	25 kg
<b>System:</b>	Meltio M600
<b>Material:</b>	Stainless Steel 316L
<b>Gas:</b>	Argon
<b>Layer Height:</b>	1.2 mm
<b>Print Time:</b>	75h





## Large Glass Mold

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### 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.

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



# Meltio Engine Integration Kit for Vertical Machining Centers

## Hybrid Manufacturing

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

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



Hybrid    Retrofitting    Geometry Freedom    Part Repair

<b>Laser System:</b>	1000 W 9 x 450 nm direct diode lasers
<b>Printhead:</b>	Mounted on the right side of the spindle 32.5 to 35 kg
<b>Printhead Retracted Size (WxDxH):</b>	280 x 332 x 684 mm
<b>Printhead Unretracted Size (WxDxH):</b>	280 x 332 x 943 mm
<b>Control Unit:</b>	Wall mounted, air-cooled 80.5 kg 600 x 300 x 800 mm
<b>Human Machine Interface:</b>	Wall mounted 17" tactile screen
<b>Cooling:</b>	Water-cooled deposition head. Chiller Included
<b>Print Envelope (WxDxH):</b>	Depending on the Machining Center

<b>Feeder System:</b>	Quad-point traction servo feeders, frictionless liners
<b>Process Control:</b>	Melt Pool Camera & Closed-loop wire modulation
<b>Power Input:</b>	200/240 V 3W+PE 380/415 V 3W+N+PE
<b>Power Consumption:</b>	9,2 kW peak 2-5 kw avg.
<b>Wire Feedstock:</b>	Diameter: 0.8-1.2 mm / Spool Type: BS300 External wire drum ready
<b>Product Configurations:</b>	Single or Dual Wire

<b>Hot Wire:</b>	Programmable power supply that preheats the material to increase the deposition rate
<b>Dual Wire:</b>	This option allows for sequential 3D Printing of up to 2 / 4 materials with very fast automatic wire switches
<b>Zero Point Clamping System:</b>	Accurately and quickly couple fixture plates to the print bed of the M600 for production





## Turbine Blade Repair

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### 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.

<b>Size:</b>	65 x 29 x 6 mm
<b>Weight:</b>	15 g
<b>System:</b>	Meltio Engine CNC Integration
<b>Material:</b>	Nickel 625
<b>Gas:</b>	Argon
<b>Layer Height:</b>	0.8 mm
<b>Print Time:</b>	6' 16''



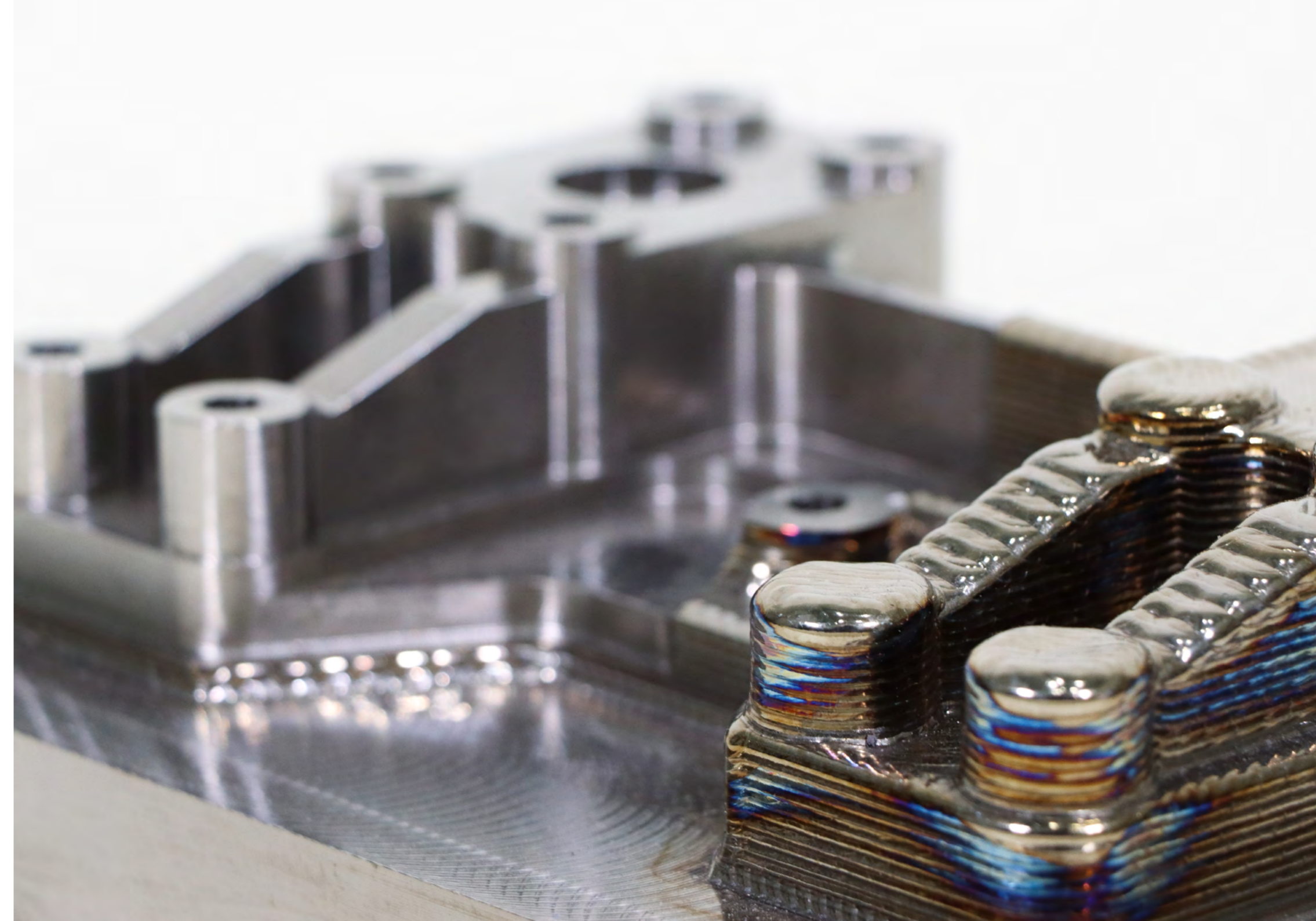
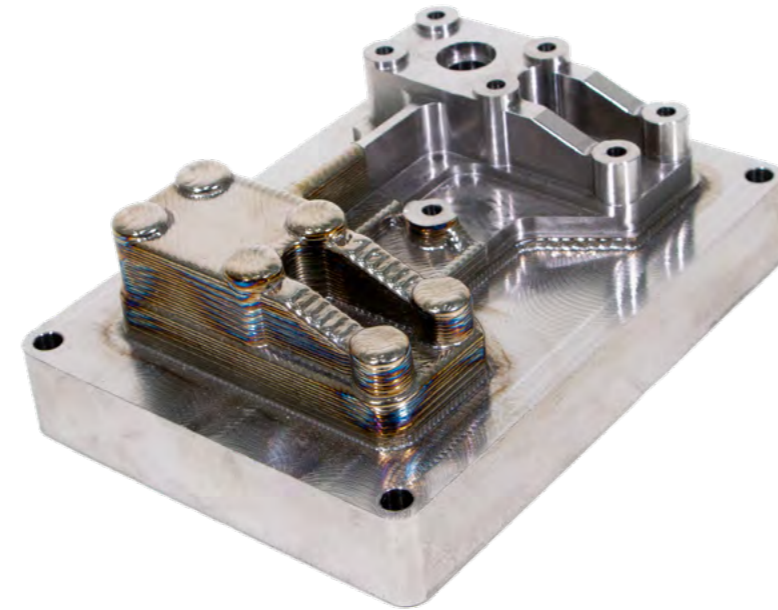
# Aircraft Bracket

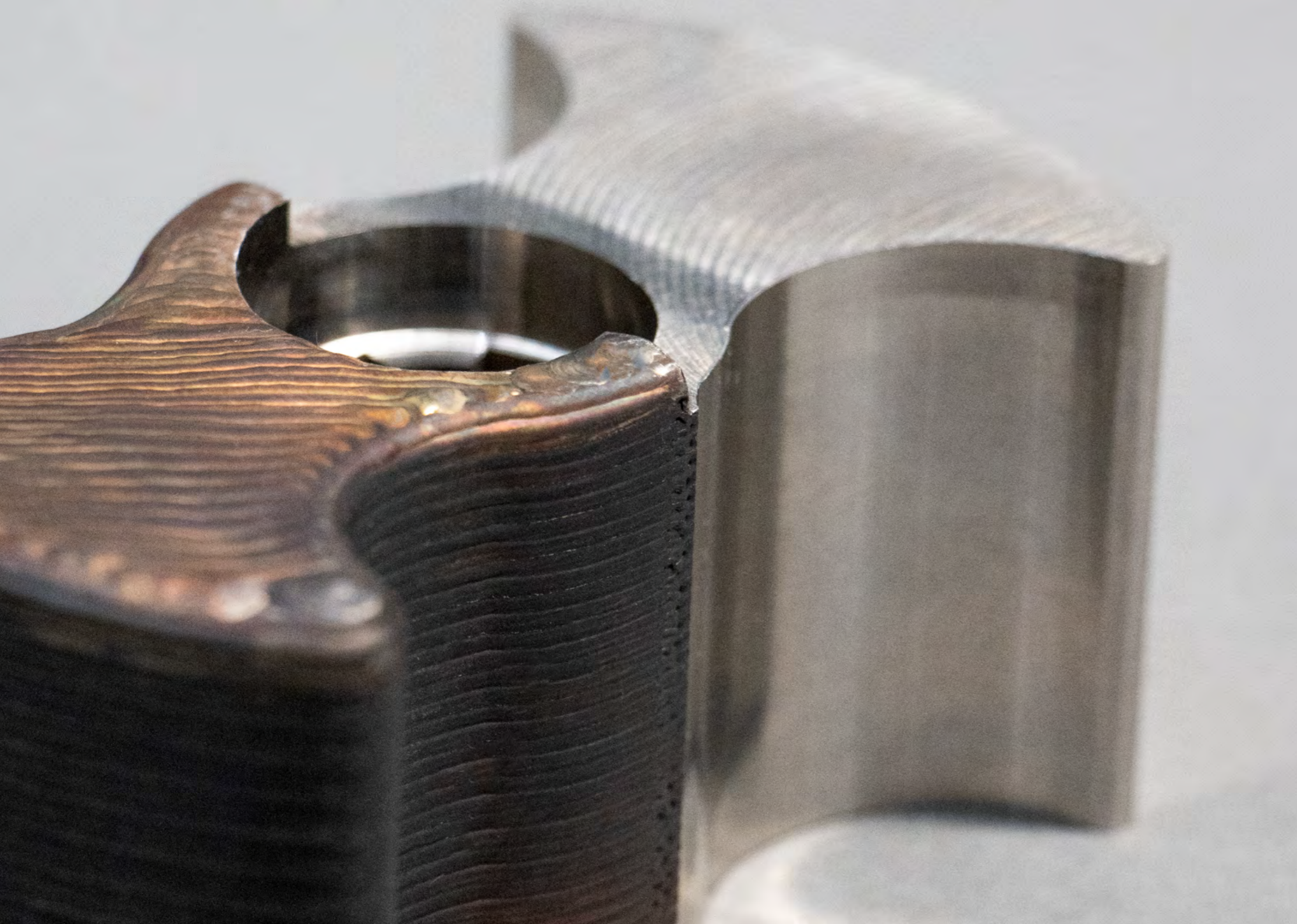
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## Aircraft Industry

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.

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





## Rotors

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### 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.

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



# Semi-Open Impeller

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## 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.

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





# Meltio Engine Integration Kit for Industrial Robots

## 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. Meltio Space slicer software for robots is compatible with ABB, Kuka, Fanuc, Yaskawa and Siemens.

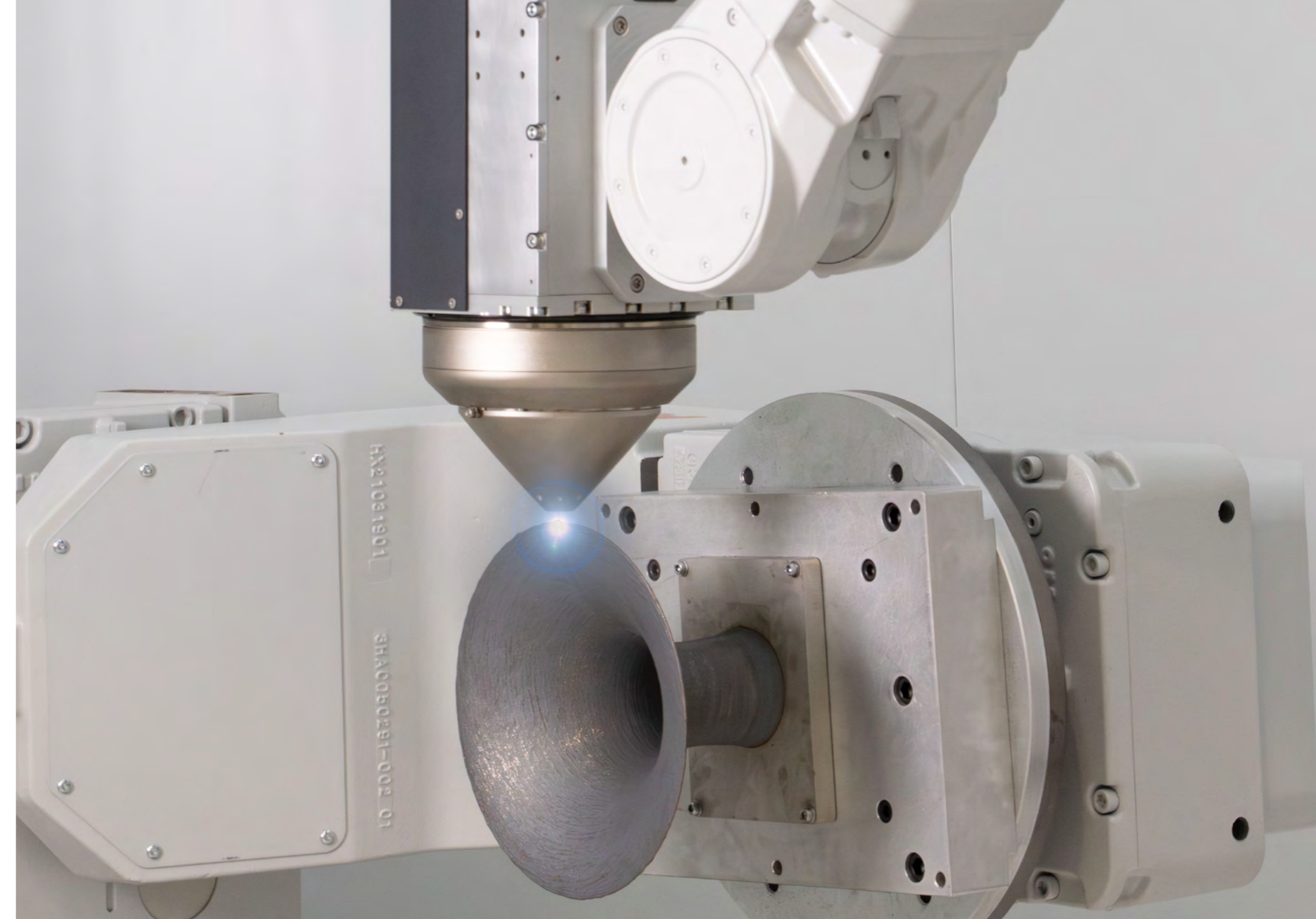


**Large-Scale** **Geometry Freedom** **Part Repair** **Cladding**

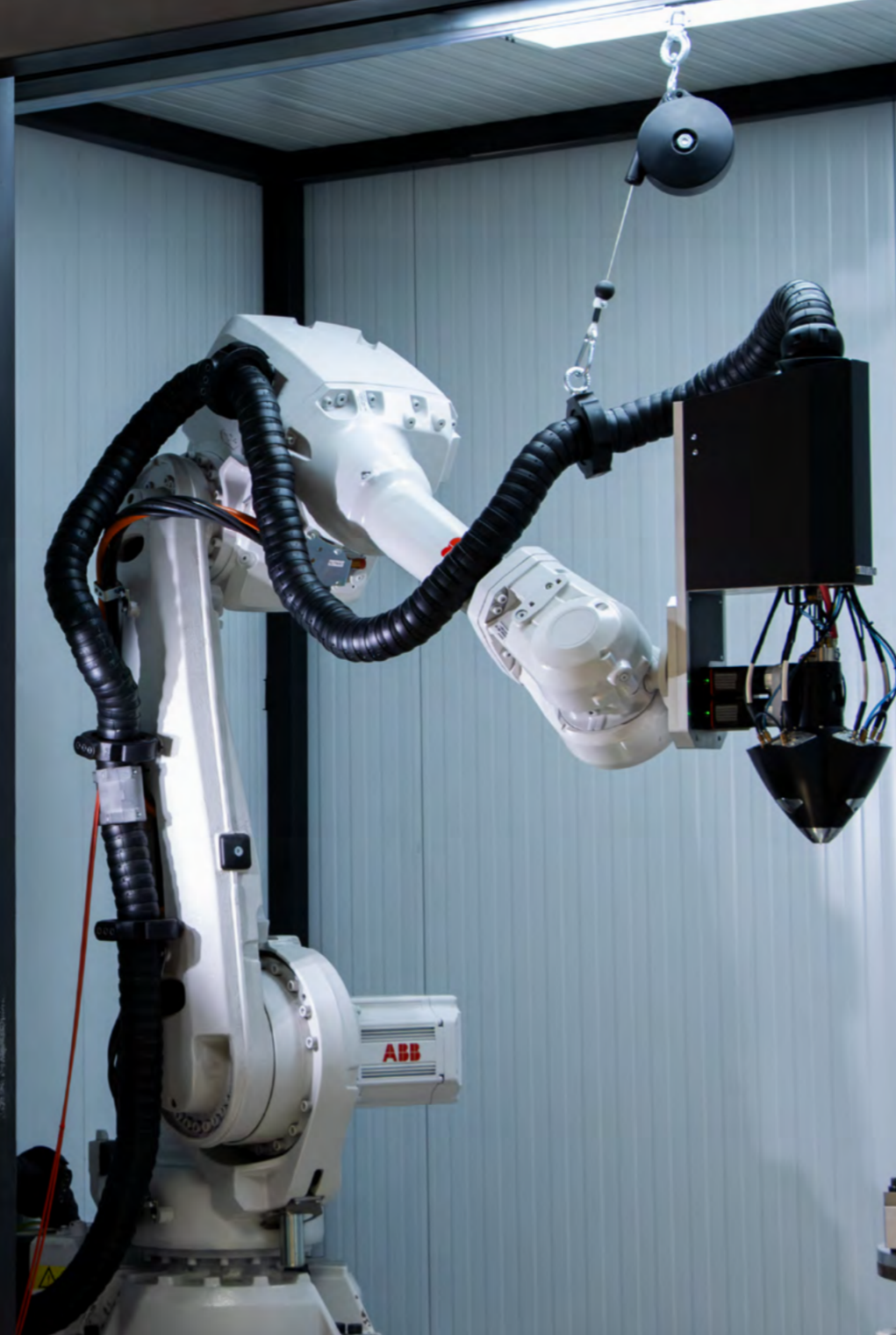
<b>Laser System:</b>	1000W 9 x 450 nm direct diode lasers
<b>Printhead:</b>	Robot Mounted 20.5 to 23 kg
<b>Printhead Size (WxDxH):</b>	262 x 272 x 572 mm
<b>Control Unit:</b>	Wall mounted, air-cooled 80.5 kg 600 x 300 x 800 mm
<b>Human Machine Interface:</b>	Wall mounted 27" tactile screen
<b>Cooling:</b>	Water-cooled deposition head. Chiller Included
<b>Slicer Software:</b>	Meltio Space 1-year subscription Included
<b>Print Envelope (WxDxH):</b>	Depending on robot's reach

<b>Feeder System:</b>	Quad-point traction servo feeders, frictionless liners
<b>Process Control:</b>	Melt Pool Camera & Closed-loop wire modulation
<b>Power Input:</b>	200/240 V 3W+PE 380/415 V 3W+N+PE
<b>Power Consumption:</b>	9,2 kW peak 2-5 kw avg.
<b>Wire Feedstock:</b>	Diameter: 0.8-1.2 mm / Spool Type: BS300 External wire drum ready
<b>Product Configurations:</b>	Single or Dual Wire

<b>Hot Wire:</b>	Programmable power supply that preheats the material to increase the deposition rate
<b>Dual Wire:</b>	This option allows for sequential 3D Printing of up to 2 / 4 materials with very fast automatic wire switches
<b>Zero Point Clamping System:</b>	Accurately and quickly couple fixture plates to the print bed of the M600 for production



# MELTIO Robot Cell



## 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

<b>Dimensions (WxDxH):</b>	4.050 x 2.350 x 3.000 mm Indoor use only	<b>Integration:</b>	Unified Control Panel, 4k WebCam monitoring & Live Timeline of sensors and 3D model based on reading TCP positions from robot
<b>Print Envelope:</b>	1 meter diameter printing volume with continuous positioner axes interpolation. Actively Cooled 300x400 mm build platform	<b>Slicing software:</b>	Meltio Space one year subscription included. Pre-defined Print profiles and slicing strategies. Focused on ease of use
<b>System Weight:</b>	4.000 kg	<b>Power Input:</b>	385-415V 50/60Hz (3W+N+PE) 20kw peak 7kw avg. upon request: 230V 50/60Hz (3W)
<b>Laser Type:</b>	Meltio Engine Robot Integrated and Tested	<b>Required Inputs:</b>	Inert Argon Gas supply between 2 to 5 bar. (Meltio offers an optional Gas Regulator) & Internet Lan cable connection
<b>Movement System:</b>	6- Axis Robot Arm & 2-Axis Workpiece Positioner	<b>Accessories:</b>	Inert Bubble for full Print envelope with Independent Atmospheric Control O2 and Humidity and Temperature Monitoring
<b>Platform:</b>	Structural Steel with Laser-safe Class 1 enclosure with CE certification. All equipment anchored to the platform		

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

# High Performance Exhaust Header

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## 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.

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





## 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.

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



# 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.

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





## Screw Compressor

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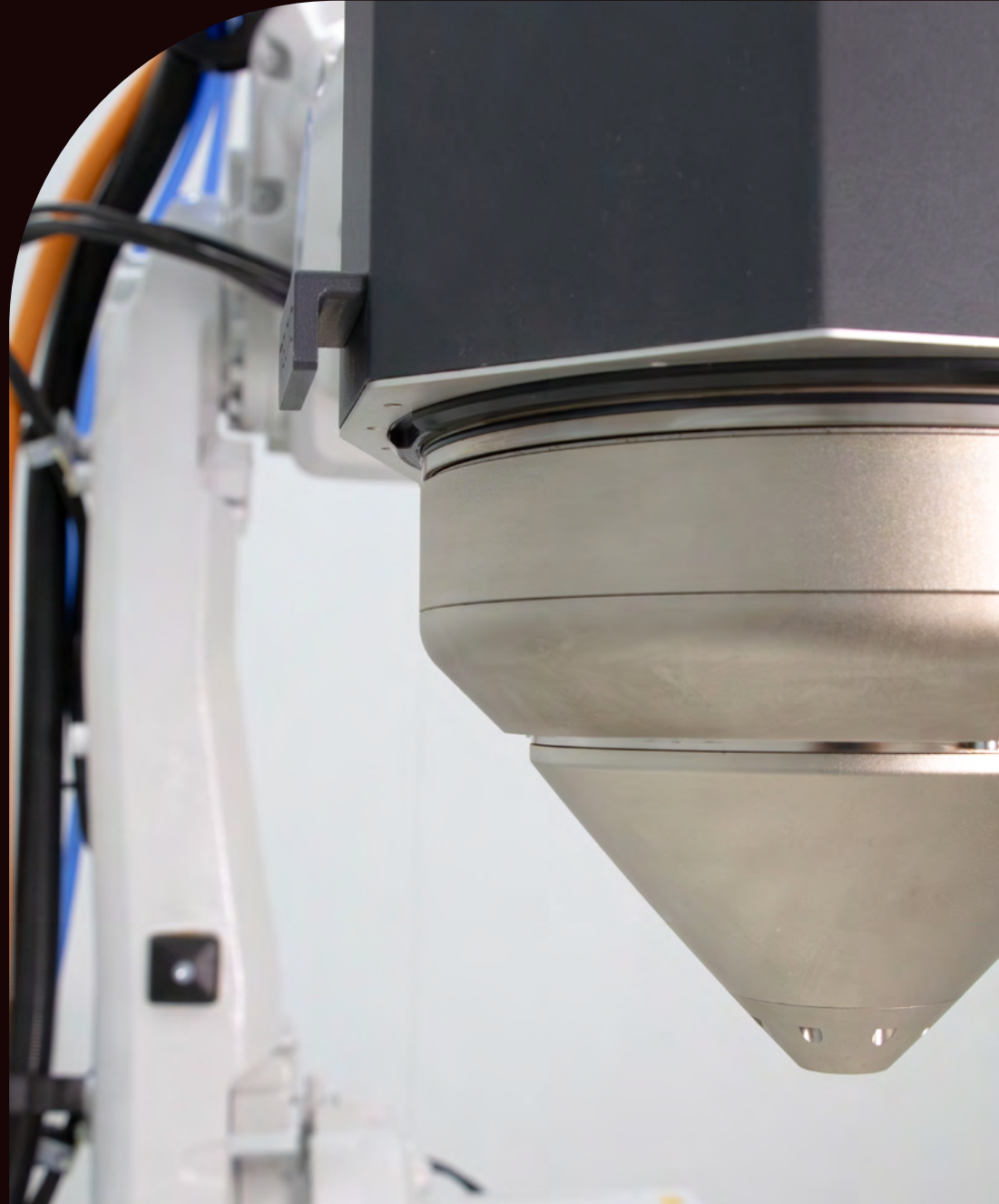
### Mining / Chemical / Petrochemical / Food

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.

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





MELTIO