



# MELTIO

ADVANCED 4D MANUFACTURING

**COMPETITIVE  
ADVANTAGES OF 3EMD  
SOLUTIONS WITH  
MELTIO'S LMD  
TECHNOLOGY**

# ADVANTAGES OF THE NEW MELTIO TECHNOLOGY

Patented technology (new in the market)

New Additive Manufacturing Technology for printing metal parts capable of using different materials of wire and/or powder without changing the configuration

Technology is able to complete prints x100 faster than existing powder bed fusion and new emerging technologies in same capex constant. (up to 0.5 kg / (h\*printing head))

Medium resolution, medium complexity, full density of the printed part

Multi head configurations are possible (Higher printing speed can be achieved)

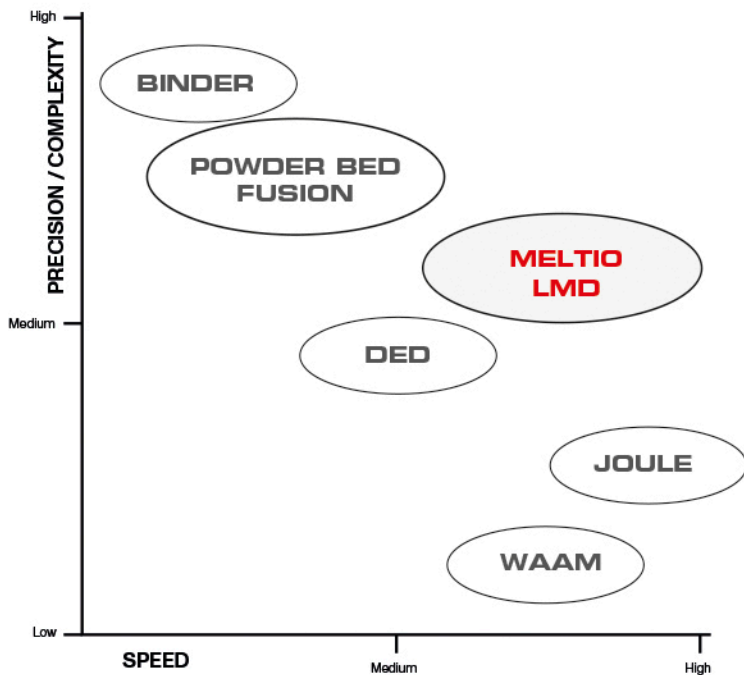
Material cost (wire) much lower than powder bed fusion processes

Price range: 89 -190 k€/machine

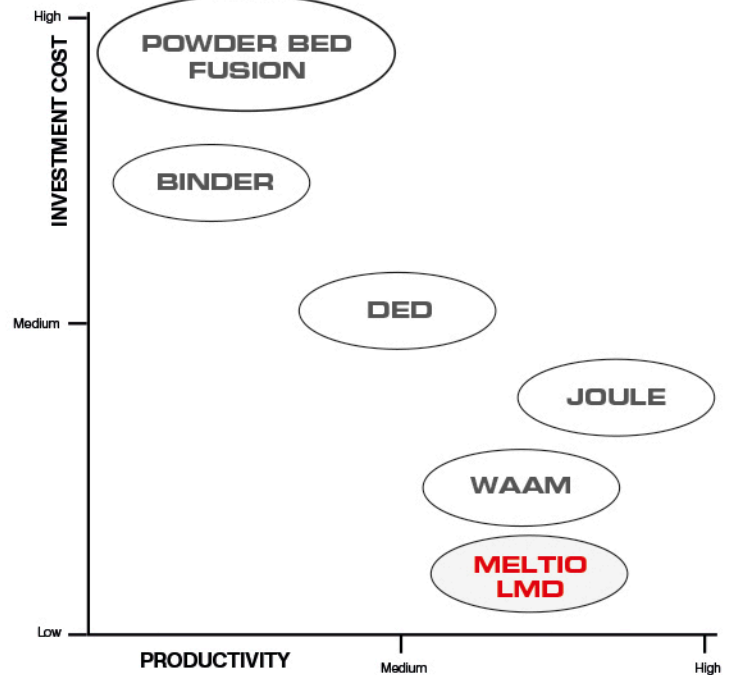
No size limitation for the final printed part

Other applications can be developed

## EFFICIENCY



## ROI

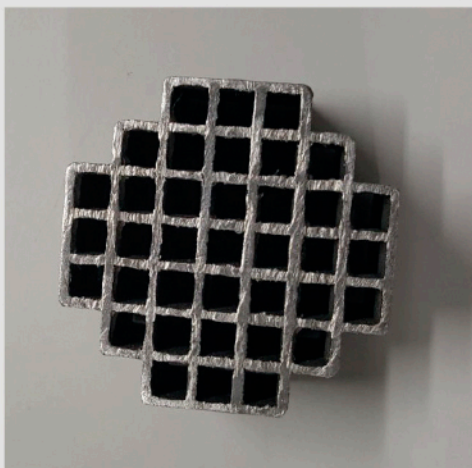


# METAL TECHNOLOGIES COMPARATIVE

	DED	BINDER JETTING	POWDER BED FUSION	MELTIO LMD	WAAM	JOULE
€/cm3	€€	€€€	€€€€	€	€€	€
Precision	*	***	****	**	*	*
Resolution	*	****	***	**/** (wire/powder)	*	*
Speed kg/h (final metal part)	***	/*	*	***	***	****
Maximum size	Not limited	Small size	Small to medium	Not limited	Not limited	Medium
Full density	YES	NO	NO	YES*	NO	NO
Hardware cost	€€€	€€€€	€€€€	€	€	?
Available materials	Titanium, Steel, Cobalt, Nickel	Steel, titanium, nickel, copper	Steel, titanium, nickel, aluminum, copper, magnesium, chromium-cobalt	Any material. Tested: Titanium, Inconel, Stainless Steel, Tungsten, aluminum. Other materials under development	Steel, nickel, titanium, aluminum, copper	?
Flexibility / adaptability (wire/powder)	Wire & Powder	Powder	Powder	Wire & Powder	Wire	Wire
Simultaneous material printing	NO	NO	NO	YES	YES (optional)	NO
Site preparation	Complex installation Safety Cross contamination	Complex installation Furnace Debinder	Complex installation Safety Cross contamination Temperature Humidity Footprint	Easy setup	Safety	Easy setup

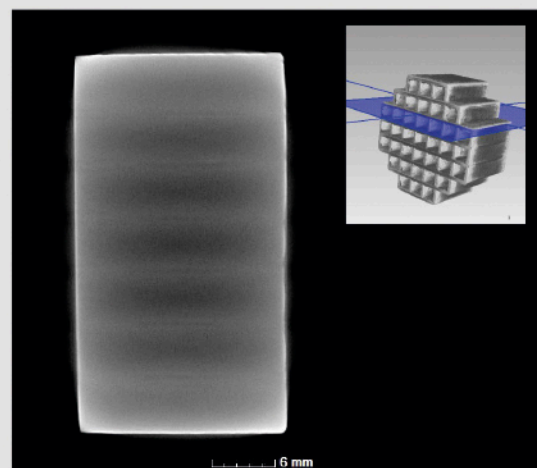
## FULL DENSITY

Axial Tomography Report



**SAMPLE**

Inspection resolution: 28 µm



**CT RESULTS**

Good densification in vertical walls of the samples

# APPLICATIONS

Meltio's LMD technology is able to offer fully dense metal parts for different industrial applications. For the first time the market has a technology capable of manufacturing parts with a low cost of production per cubic centimeter and with enough speed and efficiency for production to be competitive against traditional methods, either by substituting it completely or by working complementarily to it.

This LMD technology allows us to open up a new world of industrial possibilities translated into new applications that make Industry 4.0 more efficient thanks to competitive advantages such as:

- The manufacturing of parts of different metals in one piece
- Possibility of manufacturing with metallic wire and metal powder in the same machine
- Integration of additive manufacturing with other systems such as CNC, porticos and robots

This allows the use of LMD technology for the *following applications*

## CASTING

For the first time in history there is a technology capable of competing with the traditional methods of casting without the need for molds or tools, directly with metal additive manufacturing, thanks to reduced cost and versatility of Meltio's 3EMD Solutions.

## SPARE PARTS

Manufacture in minutes the piece that breaks at the most inopportune moment. Avoid the outdated practice of buying, storing and sending parts to the repair site.

## RAPID TOOLING

LMD allows us to manufacture parts with metals such as steel, titanium, Inconel, tungsten and more, at lower prices than what were previously possible, with 100% part density, helping us to avoid overstocking tools.

## RAPID PROTOTYPING

One of the largest applications of additive manufacturing in its multiple technological variants. Meltio's LMD technology is ideal for making parts in their intended end use material and with full density.

## REPAIRS / REPURPOSING

In addition to additive manufacturing, LMD technology allows the repair of parts and modifications in their functionality, thanks to the use of different materials in the same piece to achieve different thermal and mechanical properties.

## MEDICAL IMPLANTS

LMD technology enables custom titanium parts to be manufactured with cost and production times efficient enough to be the world's standard implant manufacturing technology.

## RAPID MANUFACTURING

Metal technology has rarely been successful in this application, due to its high costs of investment and production and difficulties in installation. Meltio's LMD technology is the first to offer an accessible technology to manufacture final or near-final parts able to replace traditional rapid manufacturing methods for short and medium series.

## WELDING & CUTTING

LMD enables the development of welding & cutting applications with an ROI never seen in the industry, thanks to Meltio's worldwide patent based on the use of laser technology.

## THERMAL DYNAMIC APPLICATIONS

The use of different novel materials allows the development of new thermodynamic applications with special materials, such as molds, heat exchangers and dies, where requirements and temperature changes are a key factor.

## AUTOMOTIVE APPLICATIONS

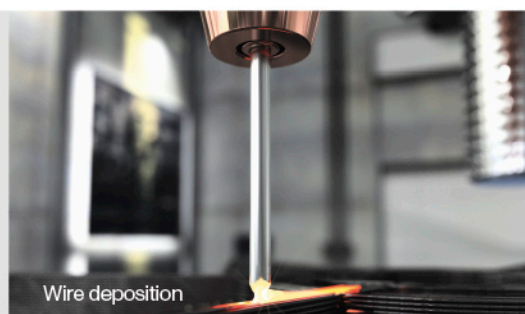
With Meltio's LMD technology it is possible to obtain parts without Size Limitation and different materials in the same part. This makes it the right technology for automotive applications (energy absorption, controlled deformation, weight reduction, etc.)

Also the technology can substitute standard parts (casted or machined) in a more cost-effective model.

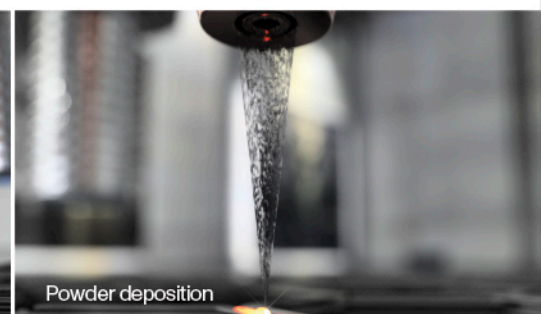
## MACHINING

LMD technology allows manufacturing pre-finished parts. This way the machining process is greatly optimized in time, material and cost.

## WIRE AND POWDER DEPOSITION



Wire deposition



Powder deposition