

AM

Aminimplus

PRECISION IN METAL

AM

MIMplus Technologies offers the production of complex shaped metal parts using sinter-based Additive Manufacturing (AM).

The processes initially produce so-called "green parts", which are then converted into purely metal parts in the subsequent process steps, debinding and sintering.

Our selected tool free AM-processes are suitable for the production of prototypes as well as for small to medium series production.

In contrast to melt-based processes, the components from the sinter-based process have a homogeneous microstructure and are free of internal stresses. Typically, densities > 96% are achieved.

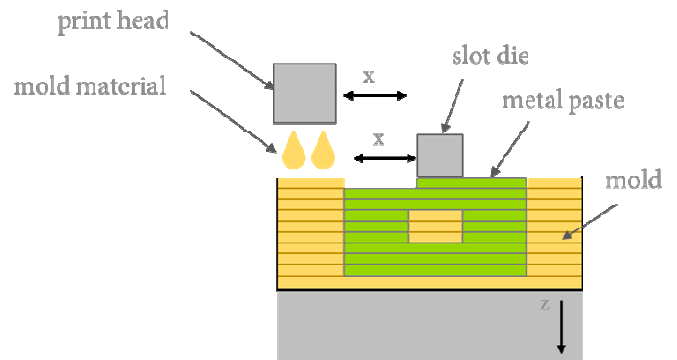
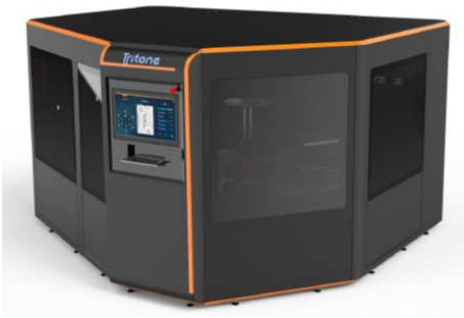
Additive Manufacturing is an extremely resource-efficient and is therefore also referred to as a "green technology".



SINTER-BASED ADDITIVE MANUFACTURING

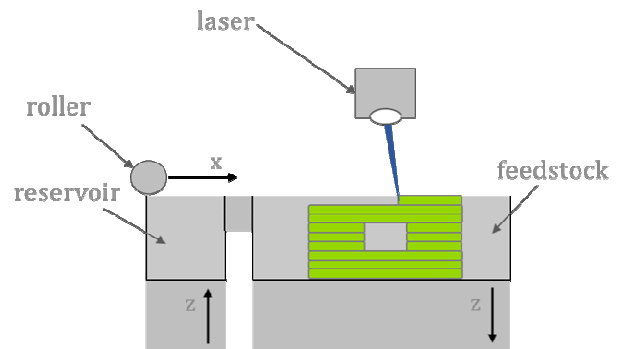
MOLDJET®

In this technology a negative mould of the component is printed layer by layer. A metal paste is applied to this mould after each layer. The component is supported by the mould during printing, so no support structures are necessary. The MoldJet process enables series production of small to medium quantities of up to approx. 100,000 units.



COLD METAL FUSION

This process runs on conventional SLM (selective laser melting) equipment for plastics printing. After a thin layer of the feedstock powder (metal powder + binder) has been applied in the build space, the binder is melted locally with the help of a laser. No support structures are necessary for the construction of the green body. The process is suitable for the production of prototypes as well as for series production of several thousand pieces.



ADVANTAGES OF AM

- No tooling necessary
- 360 degree design freedom
- Samples within days
- From individual production to small series
- Design can be changed at any time
- Material properties similar to solid metals
- Reduced material wastage

MATERIALS FOR SINTER-BASED AM

Material	Condition	Equivalent material designation	Density g/cm ³	Yield point Rp 0,2 MPa	Tensile strength Rm MPa	Breaking strain A %	Hardness	Notes
Stainless steels								
316L	sintered	DIN 1.4404	≥7.75	≥150	≥450	≥40	≥100 HV10	austenitic, non-magnetic, can be polished
17-4-PH	sintered	DIN 1.4542	≥7.60	≥660	≥800	≥3	≥290 HV10	martensitic, precipitation hardening, ferromagnetic, can be polished
	heat treated			≥1000	≥1190	≥3	≥37 HRC	
15-5PH	sintered	DIN 1.4545	≥7.60	≥750	≥1150	≥6	≥300 HV10	martensitic, precipitation hardening, ferromagnetic, can be polished
	heat treated			≥1100	≥1300	≥6	≥40HRC	
In development								
Titanium								
TiAl6V4	sintered	DIN 3.7035	≥4.30	≥600	≥800	≥3	tbd	non-magnetic, corrosion-resistant, light-weight
Tool steels								
M2	sintered	DIN 1.3342	tdb	tbd	tbd	tbd	tbd	hardenable and temperable, wear-resistant
	heat treated			tbd	tbd	tbd	tbd	
D2	sintered	DIN 1.2379	tdb	tbd	tbd	tbd	tbd	hardenable and temperable, wear-resistant, stainless
	heat treated			tbd	tbd	tbd	tbd	
H13	sintered	DIN 1.2344	≥7.40	≥850	≥1800	≥3	≥46 HRC	hardenable and temperable, wear-resistant
	heat treated			≥1300	≥1580	≥3	≥46 HRC	
Low Alloy steels								
4330	sintered	DIN 1.6511	≥7.45	≥500	≥700	≥4	≥24 HRC	hardenable and temperable, wear-resistant
	heat treated			≥1200	≥1600	≥2	≥48 HRC	
Other alloys								
Inconel 718	Sintered	DIN 2.4851	≥7,6	≥210	≥620	≥30	135-160 HV10	nickel based alloy

COMPLEMENTARY TECHNOLOGIES

In addition to our core technologies Metal Injection Molding and sinter-based Additive Manufacturing we also offer conventional manufacturing technologies like CNC precision machining. For customers who want to purchase complete assemblies from MIMplus Technologies we also have a large network of leading subcontractors for different technologies in order to be able to offer the most suitable process for every component.

Furthermore we offer different joining technologies like laser welding, soldering, special gluing as well as solvable connections. With these technologies we are able to deliver complete assemblies to our customers.



POST PROCESSING

Parts produced by MIMplus Technologies can be refined through further process steps to fulfil special requirements. With our large range of post processing technologies either in-house or at specialised sub suppliers MIMplus Technologies is able to meet many customer demands.



Electroplating



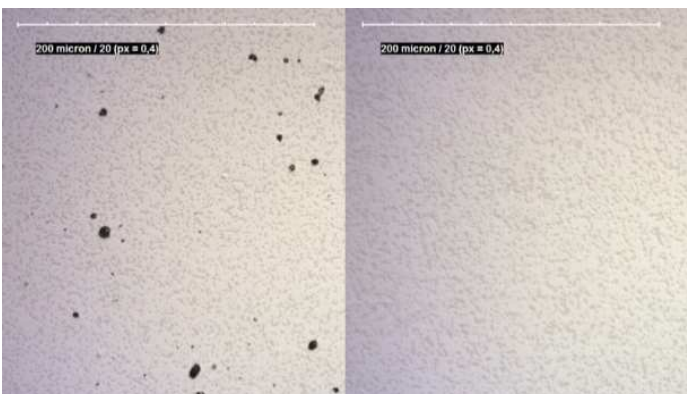
Tumbling & polishing



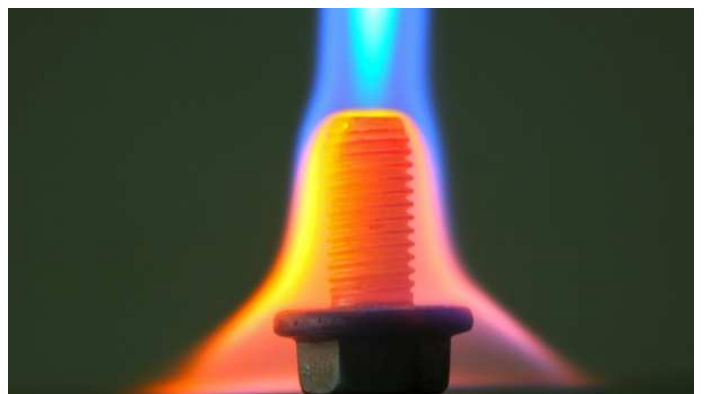
Surface grinding



PVC & DLC coating



Hot isostatic pressing (HIP)



Heat treatment

OUR INDUSTRIES

MEDICAL

Medical technology demands maximum precision and reliability. Single use is becoming increasingly important which leads to higher quantities for which MIM technology has the ideal prerequisites. For lower quantities and complex geometries Additive Manufacturing is the perfect choice.



CONSUMER & LUXURY

No matter whether your watch, glasses or handbag, they all have one thing in common. High precision metal components determine their appearance and performance. Through longstanding partnerships, MIMplus Technologies supplies these industries.



OUR INDUSTRIES

AEROSPACE

Our components are used in the aerospace industry at high altitudes. At such heights, our components are exposed to the toughest conditions. It hardly needs to be mentioned that enormous resistance, reliability, lightweight and high temperature resistance are required here.



AUTOMOTIVE

Wherever metal parts in high quality are needed MIMplus is the right partner. Well known car manufacturers have trusted our products for decades already and we deliver solutions for cars with combustion engines as well as with electric drives.

