

ARNOLD-TV  
presents

Additive  
manufacturing  
with metal



# Advanced 3D Manufacturing

- + Advisory and development partner for your ideas and for your brand new market opportunities
- + Data preparation and engineering by our designers
- + Weight and strength improvements thanks to FEM calculation and adaptive topology optimization
- + Quality assurance provided by melt-pool monitoring system, along with optical and tactile measurement technology

➔ [www.arnold-fastening.com](http://www.arnold-fastening.com)

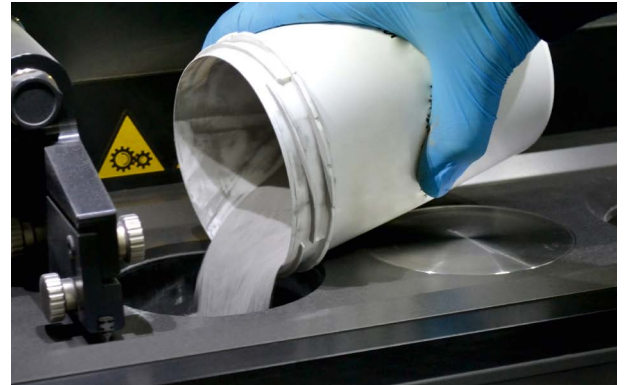


# Creating components with Advanced 3D Manufacturing

Metal 3D printing can create complex components directly from the product's 3D data, extremely quickly and very cost-effectively.

## Selective Laser Melting

With Selective Laser Melting metal 3D printing, components are formed additively from metal powder without the need for a mould or tooling. The material used is in powder form and is applied in thin layers onto a base plate, where a laser beam fully melts it. Once the first layer of material has solidified, more metal powder is applied. This cycle is repeated until all the layers have melted and the component is finished. The software takes the data needed to guide the laser directly from the component's 3D data. In principle any weldable metal alloy can be processed in powder form.



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## 1

### Analysis and individual consultancy

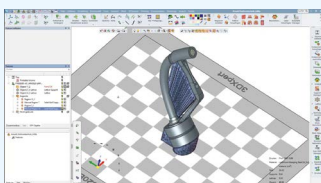
#### Redesign option

Optimize and improve existing parts

#### New design option

Engineering design for new part development

1. Check 3D print feasibility using customer data provided
2. Study component functionality, installation space and surrounding area
3. Use FEM to optimise components for weight and strength
4. Positioning on the build plate for optimum result and characteristics after printing the component (tensions, angle, support structures, etc.)



## 2

### Accurate and resource-friendly production

Setup the LM machine with specific material

Prepare the build plate

Calibrate the coating system

Import the prepared CAD data

Configure program parameters (melt pool monitoring system)

Laser melt production

Prepare the finished part by:

- Removing the build-plate from the LM machine
- Heat treating or hardening the parts on the build plate
- Separating the parts from the build plate
- Treating the surface
- Producing the test report on the 3D scanner

## 3

### Optional post-production work



Recut threads

Rework functional surfaces, for example by milling, turning, eroding, grinding, polishing

Apply coating

Laser labelling to customer specifications

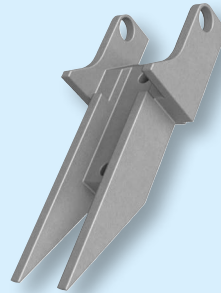
Assemble the components

# Examples of applications, and the advantages of advanced 3D Manufacturing

Conventional process

3D printing

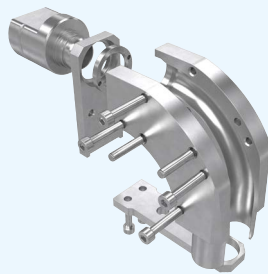
Deflector for a segment feeder



**Saves on material**  
(no machining waste)

- 3D printing:
- single piece
- Conventional manufacturing process:
- five milled parts
  - eight fasteners

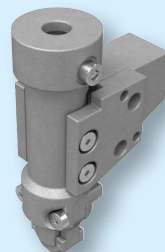
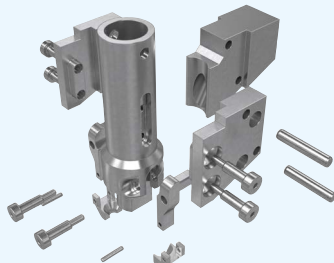
Feeder bend



**Saves resources**

- 50% lighter
- Manufacture up to 24 units in parallel

Placement head



**Saves time**

Reduces development time by 60–80%



**Which applications can our Advanced 3D Manufacturing help you with?**

Contact us by email on [additive.manufacturing@arnold-fastening.com](mailto:additive.manufacturing@arnold-fastening.com) or by telephone on +49 (0) 7947 821 5677



# The ARNOLD GROUP

Wherever customers need us.

## The ARNOLD GROUP

ARNOLD – this name is internationally renowned for efficient and sustainable fastening systems on the highest level. With a foundation of many years of expertise in the production of intelligent fastening systems and very complex extruded parts, the ARNOLD GROUP has developed over a number of years into a comprehensive supplier and development partner for complex fastening systems. With our positioning of “BlueFastening Systems” this development process will continue under a united and harmonized structure. Engineering, fasteners, and functional parts, together with feeding and processing systems, all from a single source – efficient, sustainable and international.



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