

ADDITIVE MANUFACTURING

**E-Beam  
Additive goes  
Industrial**



# Material efficient production of large components

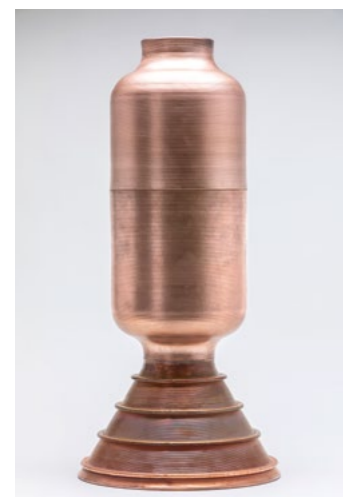


## Demanding metals and alloys

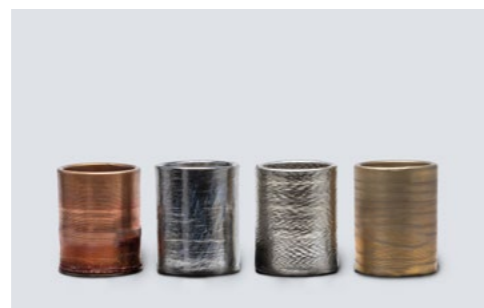
The additive manufacturing of components using an electron beam (WEBAM – Wire Electron Beam Additive Manufacturing) enables faster production times than with other comparable AM processes. Using the principle of wire deposition welding, semi-finished products as well as large metal components can be manufactured in a flexible and highly productive manner – from a batch size of 1 up to serial production.

The production of three-dimensional industrial components is performed by continuously fusing of metal wire within the vacuum of the electron beam system. Using the electron beam also allows for the creation of near-net-shape workpieces out of metals that used to be difficult to weld in one single process step.

Using our digitally controlled process, all operations can be automated and reproduced.



**COMPONENT:** Rocket propulsion (model)  
**MATERIAL:** Copper / as-built  
**HEIGHT:** 650 mm  
**MAXIMUM DIAMETER:** 295 mm



**COMPONENT:** Cylinder  
**MATERIALS:** Copper, titanium, stainless steel, copper alloy / as-built  
**OUTER DIAMETER:** 105 mm



**COMPONENT:** Square tube  
**MATERIAL:** Titanium / as-built  
**EDGE LENGTH:** 110 mm  
**CONSTRUCTION RATE:** 0,8 - 1,6 kg/h

### ADVANTAGES WEBAM

- + Production of large components
- + Faster production times than with other comparable processes
- + Production in an inert gas atmosphere using a vacuum
- + Reproducible quality
- + Economic due to its material efficiency and reduced waste products
- + High variety in materials, incl. difficult-to-weld metals
- + Multi-material-components

### THE INDUSTRIES

- ✓ Aerospace
- ✓ Mechanical engineering
- ✓ Research and development
- ✓ Energy

# Production of small and detailed workpieces



## Fast and precise

Additive manufacturing using an electron beam in a powder bed (EBM – Electron Beam Melting) is suitable for both flexible and industrial serial production of compact as well as highly detailed components.

With EBM, the component structure is melted in a powder bed using an electron beam that is added by the machine layer by layer. Our efficient and process reliable system concept allows for a significantly faster production of workpieces. Several components can be formed within one production process. In addition, the need for support structures is eliminated.

Components are created in a high, verifiable and reproducible quality due to an automated and digitally controlled process as well as in-situ monitoring.

### ADVANTAGES EBM

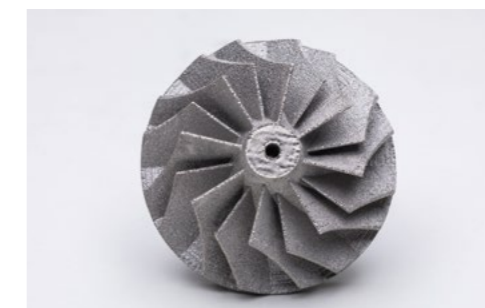
- + Production of both compact and detailed components
- + Increased productivity and parallelization
- + Faster production times than with other comparable processes
- + Reproducible quality thanks to fully automated, documentable process control
- + Ability to handle common alloys and difficult-to-process metals
- + No support structures required / stacking possible

### THE INDUSTRIES

- ✓ Aerospace
- ✓ Automotive
- ✓ Medical engineering
- ✓ Tool making
- ✓ Research and development



**COMPONENT:** Geometrical model  
**MATERIAL:** Titanium / as-built

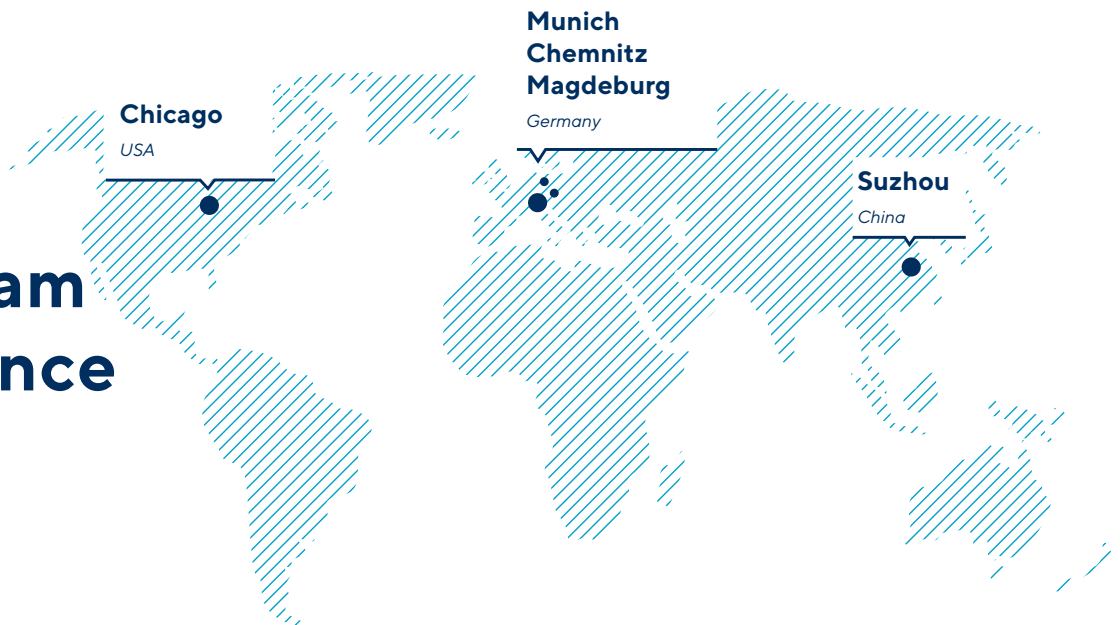


**COMPONENT:** Turbocharger  
**MATERIAL:** Titanium / as-built



**COMPONENT:** Part of an electric engine (model)  
**MATERIAL:** Titanium / as-built

# pro-beam at a glance



The pro-beam Group is a global leader for the electron beam technology. pro-beam provides services and systems for the welding, hardening, micro-drilling, and coating of surfaces.

In addition, the company operates in the field of additive manufacturing and is developing corresponding manufacturing processes for industrial applications. Customers from over 40 countries have been trusting pro-beam solutions for over 45 years. The global company is represented by five locations and more than 350 employees. The company headquarters is located in Gilching, near Munich.



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Further information on additive manufacturing can be found on our homepage. Please contact us via our contact form.

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