

# Project Study: Engineering the Cut – Designing a Next-Gen Diamond Wire Saw for Metal 3D Printing

**About AM Turbines:** At AM Turbines, we are pushing the limits of Laser Powder Bed Fusion (LPBF) to create high-performance engine components. But there is a hidden bottleneck in the industry: once a part is printed, getting it off the heavy steel build plate is slow, expensive, and wasteful. We are looking for a team of engineers to disrupt this "Post-Processing" phase by developing a smart, cost-effective Diamond Wire Saw system.

**The Challenge:** Currently, separating complex 3D-printed parts from substrate plates involves massive industrial saws or EDM machines that are overkill for many applications. We need a team to design, build, and validate a **bespoke Diamond Wire Saw** specifically optimized for LPBF components. This project combines mechanical design, automation, and cost-engineering.

## Your Mission:

- **Technical Analysis:** Evaluate existing cutting methods and define the process parameters (wire speed, tension, cooling) needed for high-strength superalloys.
- **Concept & CAD Design:** Develop a full machine concept. Select the drives, wire guide systems, and tensioning units. Create the digital twin in CAD.
- **Prototype Construction:** Get your hands dirty! Build the prototype and integrate the peripheral systems.
- **Scalability & Cost Model:** Analyze how this design can scale to large industrial build plates and calculate the ROI compared to traditional methods.
- **Validation:** Run the first cuts on real-world 3D-printed turbine components and optimize the performance.

## What We Offer:

- **End-to-End Engineering:** Experience the full cycle from a blank sheet of paper to a working hardware prototype.
- **Industrial Impact:** Work on a project that directly solves a multi-million dollar efficiency problem in AM.

- **High-Tech Environment:** Collaborate with founders from the EOS and Vectoflow ecosystem and get insights into the aerospace supply chain.
- **ECTS & Flexibility:** 12 ECTS credits, flexible start date, and a mix of remote design work and hands-on assembly with our industry partners.

#### Who We Are Looking For:

- A team of 2–5 students in **Mechanical Engineering, Mechatronics, or Production Engineering**.
- Solid skills in **CAD** (SolidWorks, Siemens NX, or similar).
- A passion for **Additive Manufacturing** and "Maker" culture (you like building things!).
- An analytical mindset: You don't just want it to work; you want it to be cost-effective and scalable.

#### Key Facts:

- **Duration:** 3–6 months
- **Credits:** 12 ECTS
- **Location:** Remote / Munich Area / Industry Partner Site

#### Ready to cut through the status quo?

Send your team application (CVs, transcripts, and a brief motivation) to:

**[Katharina.Kreitz@am-turbines.com](mailto:Katharina.Kreitz@am-turbines.com)**