



ODeCon engineering GmbH | Case Study 3D Printing

3D Printing as a Basis for Material Development

The 3D printer adAM-RD® processes metals and plastics in powder and wire form. A highlight is the subsequent integration of a 160kV X-ray source by the University of Kassel. Upgraded in this way, the adAM-RD is used for the ad hoc development of materials with high repeatability and for 100% inspection of components, ideal for certified components, among other applications.

“Competent, fair, innovative, and committed: We are pleased to have found such a competent and exceptionally committed partner in the field of control and drive technology!”

Oliver Schulte | General Manager ODeCon engineering GmbH



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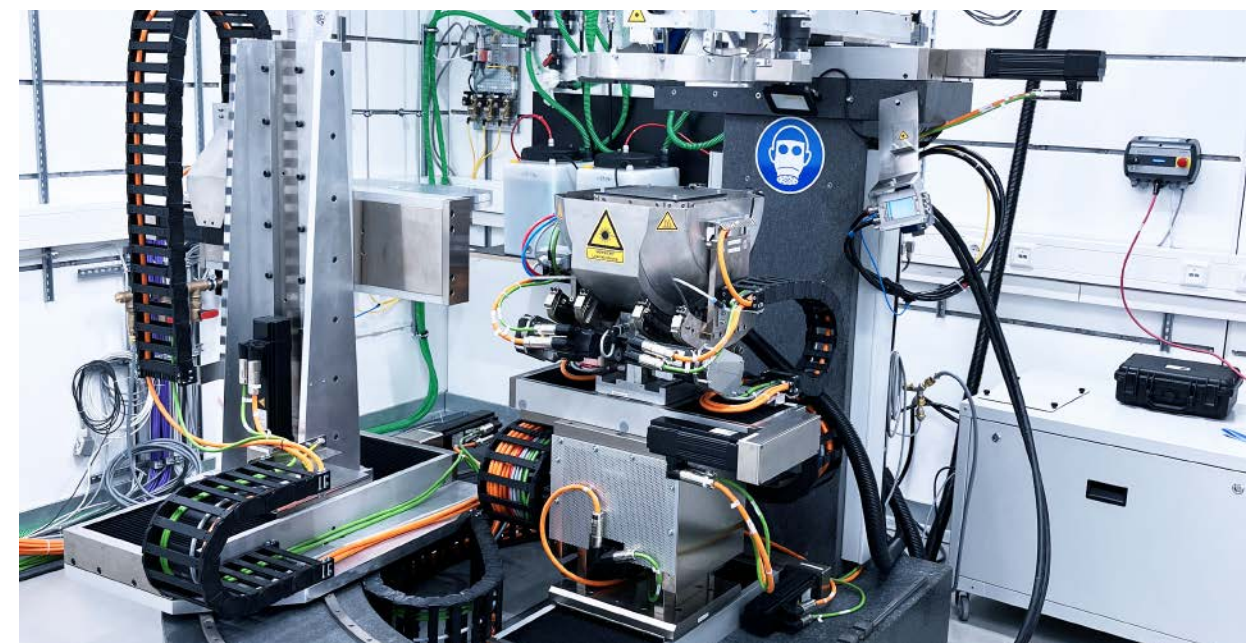
Objective

Originally, ODeCon was looking for a development partner for the CNC control of the 3D printer adAM-RD. Within a year, this collaboration evolved into a complete package for drive and control technology: Eckelmann FCS provides controllers, control systems including software and user interface plus display — an all-inclusive package for ODeCon.

The Customer

ODeCon engineering GmbH, based in Kaiserslautern, specializes in additive manufacturing technologies, laser technology, precision machines, and assembly automation. The know-how to develop the world's fastest metal 3D printer with laser deposition welding technology was brought in by the company founder, industrial engineer Oliver Schulte. His experience comes from over 26 years in special machinery, robotics, and toolmaking.

ODeCon manufactures globally unique high-performance CNC machines for additive manufacturing, hybrid-additive enhancement, and post-processing of components, preferably made of metal. ODeCon is at home in special machinery, toolmaking, and the development of special products.



› 3D printing for the production of additive components made of metals or plastics: The unique feature of the interference-free processing table with telescopic swivel axis is the clamping plate heater (up to 500°C) with integrated measurement technology.

Performance by Eckelmann

- › CNC control including safety control
- › Drive technology
- › PC technology including display
- › PC and PLC Software
- › Commissioning

Application

The adAM-RD is used for the additive manufacturing of components made of both metals and plastics. A unique feature of the interference contour-free processing table with a telescoping swivel axis is the clamping plate heater (up to 500°C) with integrated measurement technology.

The University of Kassel benefited from a call for proposals by the German Research Foundation (DFG). A radiation-proof laboratory was created specifically for the facility. There, the 3D printer adAM-RD® is equipped with a high-performance X-ray source and detectors to obtain information about materials and their properties during production.

Depending on the configuration, the cutting-edge 3D printer enables 3D laser deposition welding (powder and wire LMD), 3D and 2D laser cutting, 3D and 2D joining (laser soldering, laser welding, gluing), and 3D surface treatment (smoothing, polishing).

The highlights of the printer include:

- Four-fold conveyor for metal powder
- 4 kW laser system for metal processing
- 200 W laser system for plastic processing
- 2.4 kW VCSEL heating laser

Other components were newly developed:

- 2-axis zoom optics
- Interference contour-free workpiece clamping plate

Kinematics with	Synchronized Axes	Cube	Repeatability over 6 axes
14 Axes	9	300 mm³	2 µm

Special Features

- The follow-up order is already being implemented: the 3D printer adAM-PRO® for single and series production, which will soon be commissioned as a research 3D printing system for ODeCon in collaboration with the Eckelmann FCS team.
- Best example of successful collaboration: In the planning phase, ODeCon initially approached a global player, but received no feedback for over a year. Eckelmann’s sales team recognized the exciting challenge: one day after the first phone call, an Eckelmann Group sales representative was on-site, who subsequently passed the task on to the specialized subsidiary Eckelmann FCS.



Do you have any questions?

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