



The Siemens Mobility RRX Rail Service Center is Siemens' first digital rail maintenance center, with FDM® 3D printing at the heart of its servicing operation.

Pulling Its Weight

Siemens Mobility Boosts Custom Production Capability with FDM Additive Manufacturing

[Siemens Mobility GmbH](#), part of [Siemens AG](#), sets the benchmark when it comes to technology and engineering solutions for the mobility and transport industry. The company promises its customers 'seamless mobility' – safer, faster, more convenient. To help make this a realization, Siemens Mobility recently opened its first digitalized rail maintenance center worldwide. Located in Dortmund-Erving, Germany, the Siemens Mobility RRX Rail Service Center was designed to perfect digitalization for the rail and transport industry.

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The ability to 3D print customized tools and spare parts whenever we need them, with no minimum quantity, has transformed our supply chain.

Michael Kuczmik

**Head of Additive Manufacturing,
Siemens Mobility GmbH,
Customer Service**

Customized Solutions Increase Flexibility and Customer Responsiveness

Renowned as Siemens Mobility's flagship site, the RRX Rail Service Center expects a hundred trains to enter and leave the depot every month. This level of throughput puts pressure on the supply chain and requires robust manufacturing solutions to fulfill the wide-ranging needs of customers, quickly and cost-effectively. To do that, the company harnessed its longstanding experience with additive manufacturing and invested in additional 3D printing equipment to meet the depot's high demand.

The team has already witnessed tangible benefits, with the ability to 3D print replacement parts on-demand – increasing its flexibility to meet customer requirements. “This is where [FDM additive manufacturing](#) fits in perfectly, providing us with the capability to rapidly and cost-effectively produce one-off, customized production parts.”

The site's 3D printer has had a significant impact on turnaround times to produce replacement parts compared with traditional manufacturing methods such as casting. A part can be 3D printed in just hours, according to Tina Eufinger, Business Development, Siemens Mobility Division. “Within a week, we can iterate and optimize the design and then 3D print a final, customized production-grade part. This has enabled us to reduce the manufacturing time of each part by up to 95%, which has significantly sped up our ability to respond to customers,” she said.

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Agile Production With Customized Tooling

The RRX Rail Service Center is also leveraging additive manufacturing to increase its [tooling](#) capabilities and overcome the lengthy lead times associated with traditional production methods. The ability to 3D print customized tools on-demand lets Siemens Mobility be much more agile in production, and accelerate maintenance and repair times. On-demand customized production is particularly important in the rail industry, as vehicles that have been in an accident or vandalized will typically arrive in the depot unplanned.

One example is an important connector tool used to maintain train bogies (the chassis or framework that carries the wheelset). Tools for this application are notoriously hard to produce via conventional methods. The bogies have extremely complex shapes, require a high-level of customization and weigh several tons. Tough and durable materials are required to withstand the significant forces when the vehicle is moving or braking.

To handle this job and its other demanding 3D printing tasks, Siemens Mobility uses its [Fortus 450mc™ 3D Printer](#). It can make one-off tools customized to each bogie in just a matter of hours. To meet the material characteristics required for such a demanding application, the team uses industrial-grade [ULTEM™ 9085 resin material](#).

“Well-manufactured connectors are essential tools for the effective and safe maintenance of bogies, therefore finding additive manufacturing materials strong enough to withstand such pressures has been an important exercise,” explained Kuczmik. “The ULTEM™ 9085 resin material is super-tough, enabling us to leverage all the customization benefits of 3D printing and replace our traditional manufacturing method for this tooling application.”



The Fortus 450mc has enabled Siemens Mobility to reduce the manufacturing time for each replacement part by up to 95%.



Siemens Mobility is now using its Fortus 450mc to make one-off tools customized to each bogie in a matter of hours.

Kuczmik concluded, “The ability to 3D print customized tools and spare parts whenever we need them, with no minimum quantity, has transformed our supply chain. We have reduced our dependency on outsourcing tools via suppliers and reduced cost per part, while also opening up more revenue streams by being able to service more low-volume jobs cost-effectively and efficiently.”

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