MASSIVIT

Printing Railway Parts On-Demand

On-Site Additive Manufacturing Ensures Trams Stay on Track

Background

Composite materials offer great benefits for the transportation industries, including a superb strength-to-weight ratio. Lighter vehicles can be produced, thereby requiring less fuel and lower costs.

Challenge

Manufacturers have long awaited an efficient and sustainable way to produce large, composite parts on-demand. Railway companies suffer frequent damage to trams due to accidents. They, therefore, require custom parts and spare parts to be available for a wide range of train and tram models. This, in turn, necessitates hefty storage requirements.

Production of large composite parts requires a mold. Railway companies commonly need to wait for three months or more for a mold – and its master tool – to be produced. This process is traditionally costly and generates enormous waste.

Aim

Stratiforme Industries – a renowned service bureau that serves the leading European railway manufacturers and operators such as ALSTOM, SNCF, and CAF – sought a large-scale Additive Manufacturing technology to speed up its lead times for short-to-medium run components. The company also intended to expand its production services to clientele in the automotive, furniture, infrastructure, military & defense industries.

Solution

After researching various technologies, Stratiforme Industries installed a Massivit 5000 large-scale 3D printer in 2021 to enable the company to directly print large, custom parts and spare parts on-demand.

One of the determining factors for choosing the Massivit 5000 was its production speed, which was up to 30 times that of other 3D printers." This is largely due to the system's photo polymeric printing gel that cures instantly with the help of an internal UV light.

"We were looking for a large-format additive technology to provide optimum speed and quality,"comments Jérémie Polese - Stratiforme Industries' Global Project Designer & Business Development Manager. "Based on an extensive benchmarking process, it became clear that the Massivit 5000 offered the best solution for these factors. It responds to our customers' demands to reduce delays. It is ideal for producing large, custom parts – especially for small batches. It has also given us the opportunity to differentiate our business. The automotive, rail, defense, and marine aftermarkets are growing rapidly. Our aim is to utilize new Industry 4.0 technologies to provide our customers with a complete, onsite manufacturing solution for their needs."

Another key factor was the system's build volume [145cm x 111cm x 180cm] that would enable Stratiforme Industries to produce large, geometric structures which can be lightly reinforced with composite materials before hitting the tracks.

A Range of Tram Parts

The company uses the Massivit 5000 to print a variety of full-scale tram parts for its end client ALSTOM including front-end fairings, headlight fairings, and camera covers.

Tram Front Panel

Printing time: 16 Hours
Thickness: Between 6-8mm
Tooling price: None
Storage fees: None

Front central fairing for ©ALSTOM light rail vehicle – 3D printed, reinforced, installed, and qualified by Stratiforme Industries.

The printed front panel on the adjacent page was lightly coated with a multi-layer complex of fiberglass to produce the final composite fairing with the necessary strength and stiffness. The part was also painted, installed, and qualified by Stratiforme Industries.

The ability to lay the fiberglass directly onto the 3D printed part eliminates the need to create a mold or master tool, as the geometric core was digitally fabricated according to the required CAD design.



Tram Headlight Fairing – REIMS

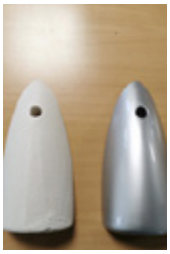
Headlight Fairing – REIMS

Printing time: 32 Hours
Thickness: Between 6-8mm
Tooling price: None
Storage fees: None


Tram Camera Cover – Strasbourg

Tram Camera Cover – Strasbourg

Printing time: 3.5 Hours
Thickness: Between 6-8 mm
Tooling price: None
Storage fees: None


Stratiforme Compreforme

Business Results

ULTRA-FAST

The Massivit 5000 allows Stratiforme Industries to deliver full-scale, customized parts for light rail vehicles in half the time it would take using conventional manufacturing methods.

FLAME-RETARDANT

Dimengel 20-FR, one of seven printing materials available with the Massivit 5000, is used by Stratiforme Industries to print all railway parts, providing flame retardancy. It is a UL94-V0-compliant, thermoset material that can additionally be coated with flame-retardant resins to serve essential flammability-related safety and performance requirements.

COST FRIENDLY

Compared with traditional manufacturing methods, the Massivit 5000 allows the company to halve the cost of production for small batches (1-6 parts). Stratiforme Industries' end clients can now order full-scale parts on demand. This significantly shortens the supply chain, eradicating the need to outsource mold production thereby, removing all tooling-related costs.

REDUCED STORAGE FOR END CLIENT

By providing on-demand part production, Stratiforme Industries enables its end clients to stock only 1-2 spare parts instead of multiple parts and molds, which take up space.

EXPANDED SERVICES & CLIENTELE

By integrating the Massivit 5000 into the company's production ecosystem, Stratiforme Industries has been able to rapidly print large, composite parts for trams – including custom dashboards, fairings, and other parts. Moreover, the business now provides large-scale 3D printing services for additional industries including marine, automotive, and defense.

Dimengel 20-FR

Massivit 5000 Large-Scale 3D Printer

For Further Information About Custom Manufacturing With Massivit 3D Printers, Please Contact Us:

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