

Manufacturing equipment maker cuts production lead time and waste, reduces time to market

TA Systems, a US producer of automated assembly lines and production equipment, reduces material lead times and decreases material waste by up to 50 percent with DSM and JuggerBot 3D, a 3D printer builder.

Customer

Totally Automated Systems (TA Systems)

Challenges

- Improve manufacture of critical assembly-line parts touching details and fixtures
- Reduce the high volume of material wasted with traditional subtractive manufacturing processes

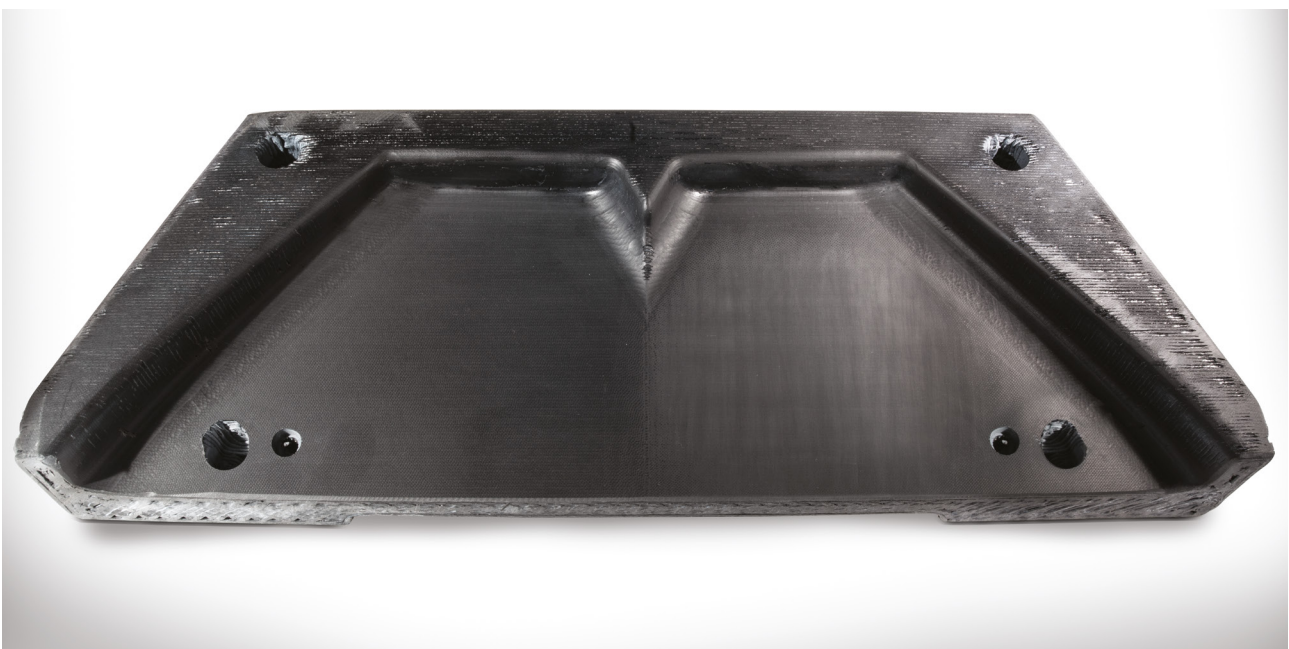
- Change the perception that additive manufacturing materials are costly and fragile

Solution

- High performance DSM pellet material EcoPaXX® AM4001GF (G)
- Collaboration with industrial-grade 3D printer builder, JuggerBot 3D

Benefits

- Material cost savings and reduction in material waste by up to 50%
- Reduces production lead times
- Produces end parts with similar characteristics to metal parts
- Expands the scope and complexity of parts that can be produced
- Implements a more sustainable production process



“EcoPaXX® can help improve our bottom line and boost profitability due to reduction in material waste, material lead times and process times. It will allow us to be more creative with our approach and processes, while offering customers more in terms of capabilities, customization and thinking outside the box.”

Tom Martin, Head of R&D, TA Systems

Challenges

Totally Automated Systems (TA Systems), a US-based company, makes specialized and automated assembly machines for manufacturing vehicle parts for the world’s leading automotive brands. One critical part of a TA Systems machine is the part nest which holds an assembly - like an instrument panel, center console or interior door panel - so it can be worked on as it moves along the assembly line. Nests are custom-made for almost every application since they have to reflect the shape of today’s complex 3D-styled parts.

Traditionally, nests are produced by CNC milling large blocks of polymer materials such as UHMW (ultra-high-molecular-weight polyethylene) or aluminum. But this is costly, not sustainable and designs are limited to those that can be milled. Some nests end up with approximately 50 percent or more of material cut away and discarded.

TA Systems was interested in additive manufacturing as a potential solution to reduce material waste, save time and to make nest production more flexible. Tom Martin, Head of R&D at TA Systems, said, “We’d buy a huge block of material and start machining it, then end up throwing a high percentage of it in the trash in the form of chips. That’s a lot of dollars wasted! Until recently, 3D printing hadn’t been an option because materials were limited, expensive and fragile.”

Solution

TA Systems discussed their situation with **JuggerBot 3D**, a DSM business partner and developer of 3D printing machines.

JuggerBot 3D recommended a new additive manufacturing material from DSM called **EcoPaXX® AM4001GF (G)**. This polymer for 3D printing fused granulate fabrication (pellet printing) is based on DSM’s bio-based engineering material. The material’s strength, high-temperature resistance, and ability to hold precise detail make it ideal for end-use parts used in industrial manufacturing environments.

TA Systems decided to test EcoPaXX® on an existing nest used to hold a section of a vehicle’s interior door panel. The nest was printed by JuggerBot 3D using its **Tradesman Series™ P3-44** fused granular fabrication 3D printer. “Traditionally, 3D printed materials haven’t been strong enough to withstand the rigors of a manufacturing assembly line,” said Martin. “But to our surprise, EcoPaXX® performed extremely well. It is heat resistant and very robust - characteristics which make it an ideal material for our applications.”

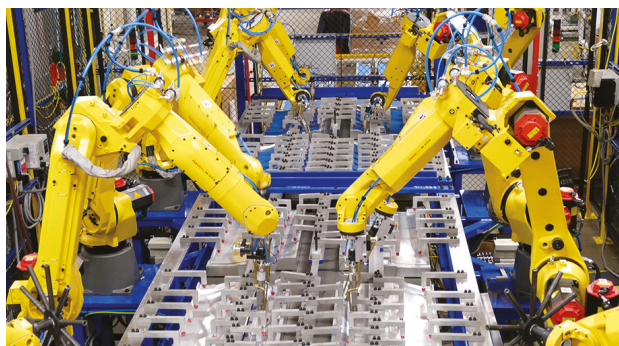
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Benefits

EcoPaXX® helped TA Systems save on cost by eliminating material waste during production. “Instead of ordering a large 250-pound block of material and removing a high percentage of that material with a CNC, additive manufacturing materials like EcoPaXX®, allow us to print only what is needed, from material on site, which is much more cost efficient,” said Martin. Plus, the plant-based composition of EcoPaXX® make it sustainable.



In addition, by using fused granulate fabrication instead of traditional manufacturing, TA Systems was able to print the nest near net shape so that it only required a finish path on the CNC for cleanup. This eliminated the usual rough and semi finish passes on the CNC, saving process time. Faster production helps the company get to market quicker and allows it to spend time elsewhere; working with clients, designing new parts, etc.

TA System found EcoPaXX® was easy to work, machined like aluminum and achieved a fine surface finish. This is essential for nests to be able to hold parts accurately while they are processed.

TA Systems is planning to use EcoPaXX® for other parts in its assembly line machines that used to be made from aluminum, such as brackets and holders. Martin expects 3D printing technology and materials like EcoPaXX® to replace 20 percent of TA Systems’ aluminum parts. “Additive manufacturing allows us to create designs for products that can’t be achieved with milling. It means that we can design and build products that are more purposeful that we couldn’t manufacture before.”

TA Systems’ manufacturing technology knowhow along with DSM material expertise and JuggerBot 3D printing equipment is an example of how collaboration expands the capabilities and applications of additive manufacturing.