



PARAGON
AM Technologies

CASE STUDIES:

The use of MJF in automotive applications

Case studies courtesy of HP and Partners



- Better design
- Improved performance
- Rapid production cycle
- Quicker customization and faster response to customer requests



GM uses AM for Cadillac Blackwing

The Challenge: GM sought a cost-effective way to produce low volumes of component parts, two of which were complex and with side wall thickness alterations that would create issues during tooling for injection moulding.



The Parts:

- Two HVAC Ducts – one for the rear cabin and one for a phone charger socket.

The Solution:

- Parts printed in PA12 Nylon using Multi Jet Fusion Technology. PA 12 is heat and chemical resistant, and has UL 94 and UL 746A status
- Removing tooling costs and implementing design for additive manufacturing processes (DfAM) made the process efficient and economical

Takeaways:

- The manual-transmission versions of each of the V-Series models has functional components made through 3D printing for production. This offered GM the most cost-effective way to manufacture each of these parts
- 3D printing for production allowed repeatable production of complex shapes. Following the success of its collaboration with Chevrolet, GM's Cadillac subsidiary has also announced that its new CT4-V and CT5-V Blackwing sedans will feature four 3Dprinted parts each. Leveraging additive technologies, the Cadillac R&D team has been able to optimize the upcoming car's transmission, harnesses and ducts.

CUNNINGHAM C8 CORVETTE: AM-produced Aero Fin Camera Mount

The challenge: Lingenfelter Performance Engineering built this custom C8 Corvette Stingray to commemorate the No.3 Corvette that won its class at the 1960 24 Hours of Le Mans. 60 Units were created. The downforce on the fin can be as much as 1200lbs, and so the air intakes and camera mounts needed to be both robust and aerodynamic, and yet, due to low numbers, cost-efficient.



The Solution: Opting to print the parts for the 60 parts using Nylon PA 12 provided design freedoms not available using production methods involving tooling.



The Engine Ram Air Snorkels, which provide a cold air feed for increasing manifold pressure, were also printed using PA12 Nylon. The parts were dyed and finished afterwards..



The result: With this limited edition run additive had the best ROI and offered design freedom not available with other technologies.

MAFLOW

Quality Control Jig



Challenge: Spanish company, Maflow is a Tier 1 in the automotive industry that manufactures products with very high quality requirements. Each manufactured component has its own quality control tools that are designed and manufactured for each new project. These tools are used by Maflow until the production is discontinued by the OEM. Maflow needed a quick, repeatable solution for a constant supply of low volume, specialised jigs. These needed to be extremely precise and robust.

Solution: PA 12 Nylon is rigid enough to endure rough handling. These jigs have complex shapes, and the alternative solution was to machine the parts.



Results:

Reduced Lead Times

75% lead time reduction in the design of quality tools.

Cost savings

60% savings in cost compared to other manufacturing alternatives (machined aluminum and SLS manufacturing).

Design Freedoms

Increased ergonomics for the operators when they are hand-held tools.

Exceptional Repeatability

Development of components that can be replaced due to wear and tear.