

MAKING TRACKS



British Automotive Design & Manufacturing Firm Reduces Prototyping Times By 68%

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— Gordon Murray, Gordon Murray Design

The T.25 City Car by Gordon Murray Design

Gordon Murray Design, led by McLaren Formula One veteran Gordon Murray, is based in Surrey, UK. Since its inception in 2007, the company has been at the forefront of automotive intellectual property, design, prototyping and development. Its first prototype, the T.25 City Car made its first public appearance in June, 2010.

The company invested in a 3D printer to manage the entire design and prototyping process in-house. The machine is used in the prototype workshop to build multiple components for design and tooling.

Simplifying Car Manufacturing

Gordon Murray had his epiphany moment whilst stuck in traffic on the A3 road in the United Kingdom. His motivation since that day has been to reduce congestion on roads by designing vehicles that are easier, cheaper and more ecological to run.

The company is behind the iStream assembly process. Winner of the prestigious Autocar Ideal of the Year award in 2008, iStream constitutes a radical redesign of the traditional manufacturing process. The simplified assembly process means that the manufacturing plant can be designed to be 20 percent of the size of a conventional factory. This can reduce capital investment in the assembly plant by at least 80 percent. The process is also very flexible, meaning that more than one car can be manufactured on-site at the same time. In order to protect its intellectual property, have control over the overall design process and save on outsourcing costs, Gordon Murray Design purchased a Fortus® 400mc™ 3D Production System.

Gordon Murray cites ease of use and installation as being crucial for the company during the selection process. It was the reputation of Stratasys in the industry that made them the perfect partner. "This has been demonstrated in Stratasys' commitment to forming an ongoing business relationship with us," says Murray. "We have not had a single problem with either the machine or the company since day one."

How Does FDM Compare to Traditional Methods for Gordon Murray?

Method	Cost	Lead Time
Outside prototyping	£1,892	75 hours
In-house prototyping with Fortus	£792	24 hours
SAVINGS	£1,100 (58%)	51 HOURS (68%)

Outperforming Expectations

Gordon Murray Design is fundamentally an R&D company, and as such the team is programmed to push design boundaries and solve problems. This has meant that they have been able to get more from the machine than they had ever envisaged. "We recently had a problem with the extrusions on rubber door seals," continues Murray. "Each time we tried to pull them into place, the corners creased. We thought we would need to get a new tool molded just to enable us to pull the corners through."

However, designers used the Fortus 3D Production System to make both the tool and soluble core used to cast the elastomer polyurethane resin to form the seals. "The whole thing ended up costing us one pound instead of the 20,000 pounds it would have cost to have it made off-site," says Murray.

Prototyping and manufacturing using the 3D printer plays a significant part in reducing development costs across the board. The Fortus 3D Production System has been involved throughout the design and prototype of the company's inaugural vehicle, code named T.25.

The T.25 represents a major breakthrough in city car design. It has been optimized through design for strength, performance, weight, cost, safety, usability, tooling, quality, energy efficiency, recyclability and ease of assembly. The T.25 has some vital properties for successful city driving, such as being able to park at 90 degrees to the curb, park up to three cars in one parallel space and significantly reduce environmental impact, both in terms of material contact and day-to-day operation.

The Fortus 400mc was used on the design of the T.25 every single day. It also outperformed its original expectations, as Murray explains: "We were initially using the machine as a design tool, but soon discovered that we could use it more and more for structural parts. In fact, we've designed the entire of the T.25 interior using the machine – including the instrument panel, sun visor, internal mirrors and internal trim. We expect to be able to do the same with our next project, the T.27."

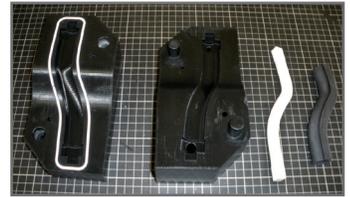
Reduced Costs and Lead Times

The machine has helped Gordon Murray Design to significantly reduce costs and lead times associated with the production of many other prototype parts, enabling projects to be delivered quicker and more effectively. The company is now at work on its T.27, an all-electric three seater city car.

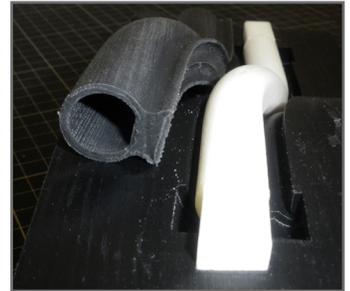
"The 3D printer will continue to make a huge contribution to bringing this new car to market," concludes Murray. "We look forward to developing our relationship further as we continue to make our vision for a new range of fun, affordable and energy efficient cars a reality."



Problem: Standard extruded seal kinks when following extreme curvature to maintain section.



Solution: Tool set including sacrificial core to produce moulded seal.



Result: Moulded seal, mould tool & core.



New door seal without kinks.

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