

HP Multi Jet Fusion technology allows AMufacture to design and 3D print a light, watertight, complex manifold for racing boat





Introduction

With HP Multi Jet Fusion technology, AMufacture designed and 3D printed a manifold light enough to fit a carbon racing boat, whilst remaining watertight and effective with high pressure for long times.

AMufacture is a 3D printing technology innovator, developing new additive manufacturing technologies to fill gaps and meet clients' demands. They pride themselves in being at the forefront of 3D printing in the UK.

Their in-house capability and global network consist of leading technologies, enabling them to deliver the right manufacturing process for any need: from concept to functional part, tooling production and everything in between, they scale when their clients do, changing and adapting with them. Their goal is to innovate quickly, in order to meet changes in demand and specification more effectively.

At AMufacture, they work closely with their partners to streamline their supply chain via one or many of their 3D printing and additive manufacturing solutions and are specialists in Multi Jet Fusion. Their recommendations and expertise in 3D printing and generative design services can work together to make what the market needs, fast.

● Industry

Industrial
Mobility and Transportation

● Sector

Fluid systems
Boats and Yachts

● Objective

To offer their customers the best-in-class technology available to build effective and precise components with complex designs

● Approach

AMufacture installed their 3D Printer in September 2021 and are one of the first on demand manufacturers to offer the technology

● Technology | Solution

HP Multi Jet Fusion technology,
HP Jet Fusion 5210 3D Printing Solution

● Material

HP 3D High Reusability (HR)1 PA 12

Challenge

Probably the main challenge in racing boats manufacturing is to be able to build an aerodynamic, efficient and precise racing boat, in which all the components, from big to small, contribute to its total weight and performance.

When having to produce an element that is constantly subjected to harsh environments, such as strong liquid pressure and long-term need to perform in a flawless fashion, not all manufacturing technologies are up to the challenge, and off the shelf solutions are not a viable option. Both in terms of limited design capabilities and final quality of the piece.

And this issue was what AMufacture faced when their client commissioned them to make an integral and crucial part for their 52ft yacht, that needed to be ready to take on a transatlantic challenge.



Data courtesy of AMufacture

Solution

Therefore, AMufacture had one specific demanding brief: design and 3D print a manifold (controls water going into a ballast tank) light enough to fit a carbon racing boat whilst remaining watertight and be able to withstand up to 20 bar pressure, all within a 10 day lead time.

In order to do so, the HP Multi Jet Fusion 5210 MJF 3D printer is up and running at AMufacture headquarters, as they have finally disposed of the multiple pallets and boxes that come with it ready to begin printing their customer's parts.

A crucial part of AMufacture's on-demand service is listening and understanding their customers' needs and it was clear that what they needed was faster and more economical parts. As their ethos is "Simply Delivering Innovation", investing in new technologies is key and AMufacture is now one of the first on-demand manufacturers to offer the HP MJF 3D Printing solution to the market.

In fact, AMufacture provided their client with a stunning final use component, with a completely water repellent surface throughout the internal chambers and a smooth, black dyed surface that could not have been manufactured by any other traditional method in the time available.



Result

The commission was to design and 3D print this bespoke manifold light enough, as demanded by the very nature of a carbon fibre racing yacht, whilst remaining watertight and maintaining integrity at a sustained 20 bar pressure.

AMufacture installed their HP 5210 MJF Printer in September 2021 and currently are one of the first on-demand manufacturers to offer this revolutionary technology, which allowed them to print this extremely complex part in PA12: a warranty for the ultimate in water tightness and aesthetics, after a process of chemical smoothing and black dyeing.

This custom manifold, part of a time-critical project, would have been very challenging to manufacture without reverting to 3D printing as an innovative solution, with the inevitable consequence of the project being delayed: 3D printing enabled the client to achieve their crucial 10 days lead time, with AMufacture delivering the components in just 6 days. Traditional manufacturing would have taken 4 weeks and an off-the-shelf component would have failed the weight criteria.

In conclusion, thanks to additive manufacturing's unique capabilities, AMufacture was able to deliver the application several days before the deadline, obtaining a drastic reduction in terms of lead times, without compromising on quality and functionality of the piece.

"At AMufacture we are committed to offering our customers the best-in-class technology available and our investment in HP's Multi Jet Fusion Technology demonstrates our promise to do just that."

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