Blueflite's breakthrough in last-mile drone delivery with HP Multi Jet Fusion 3D Printing

Ross Davis, an Aircraft Design and Systems Engineer at Blueflite, shares insights into the company's journey. Specializing in medical, consumer, industrial logistics, and government sectors, Blueflite not only creates drones but also offers comprehensive aircraft management software solutions. The company's short-term objectives are to refine their design and manufacturing processes and secure key customer accounts. Blueflite's long-term vision is to dominate the US market in cargo-specific UAS, leveraging its unique position to drive widespread adoption and industry leadership.

Introduction

In an era where rapid delivery and efficiency are paramount, Blueflite stands at the forefront of innovation with its next-generation delivery drones. Since its inception in 2018, the company has been on a mission to streamline the last mile delivery of critical goods, harnessing the power of HP Multi Jet Fusion 3D printing to achieve unparalleled performance and reliability.

Industry

Aerospace, logistics and drones

Sector

Unmanned Aerial Vehicles (UAV)

Objective

To revolutionize last-mile delivery logistics with advanced, lightweight drones manufactured using HP Multi Jet Fusion 3D printing technology for enhanced design, prototyping, and production efficiency.

Technology solution

HP MJF Technology

Material

HP 3D High Reusability PA 12, ESTANE® 3D TPU M88A, and other advanced materials

Problem

Blueflite faced several challenges in optimizing weight and strength for their UAVs, which are critical for performance. Prior to adopting HP's technology, Blueflite's reliance on traditional carbon fiber layup and FDM printing was proving inadequate due to the visible layering that was not acceptable for a high-quality aircraft. Furthermore, the SLA technology they moved onto produced parts too brittle for practical use, and SLS technology often resulted in parts too heavy for the UAVs' stringent weight requirements. The labor-intensive nature of carbon fiber layup, with its long lead times and inflexibility to design changes, hampered the company's ability to meet rapidly evolving customer needs.

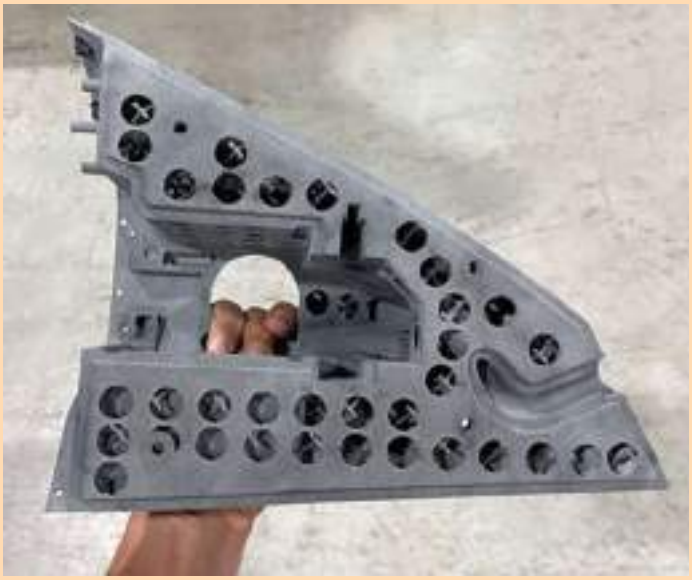
Solution

Transitioning to HP Multi Jet Fusion 3D printing solutions enabled Blueflite to overcome these hurdles with better material properties, surface finish, and overall part quality. Blueflite now includes 48 MJF printed components in each aircraft, which range from exterior body panels and electronics mounts to motor locking features and landing gear. These parts are essential for various applications such as the fuselage, landing gears, and battery cases, and they benefit from the design flexibility offered by ribs and lattice structures. The use of HP's Nylon 12 material, known for its low density and high strength-to-weight ratio, became the obvious choice for Blueflite's lightweight UAVs. The company also utilizes HP's extensive application support and engineering expertise to optimize its designs.

Benefits

The adoption of HP Multi Jet Fusion 3D printing technology has delivered substantial benefits to Blueflite:

- Weight reduction: Achieved a 25% reduction in fuselage mass, essential for UAV performance.
- Efficiency: Modeling time was slashed from weeks to mere hours, with shell and fill time reduced to 5 minutes, accelerating the development cycle.
- Quality: High-resolution printing results in parts with an exceptional surface finish, enhancing the overall product aesthetic.
- Adaptability: Quick iteration and prototyping of parts allow Blueflite to meet diverse customer requirements with agility.



Inner Tail Cone

Results

HP Multi Jet Fusion printers have significantly improved Blueflite's production capabilities. The tangible results include lighter, stronger, and more reliable drones that set new industry benchmarks. These advancements in manufacturing provide global distribution capabilities, significant **labor reduction** by moving away from traditional composites, and greater ease in supporting and updating customer design requirements. Blueflite has seen a substantial **efficiency** gain, supported by a **lightweight fuselage,** which is a product of the lightweight and **high-strength parts** printed with MJF technology. The move to HP 3D printing has enabled Blueflite to produce 2-10 iterations of every component that is printed, streamlining the design process and enhancing the company's ability to quickly respond to evolving customer needs.

Customer feedback

Blueflite's innovative approach and enhanced capabilities have resonated well with customers, who have noted the impressive quality and finish of the UAVs. The vision of a global supply chain has particularly struck a chord with clients, especially given the operational challenges in remote locations.

Conclusion

Blueflite's story is a testament to ingenuity and forward-thinking, demonstrating the transformative power of HP Multi Jet Fusion 3D printing in the aerospace and logistics industry. Through continued innovation and strategic use of advanced manufacturing technologies, Blueflite is poised to redefine the landscape of last-mile delivery. The company's commitment to quality, efficiency, and sustainability is evident in the impressive results achieved and the positive feedback from their customers.

Looking ahead

As Blueflite's journey with 3D printing evolves, the company aims to expand its printing capabilities to create even larger and more complex parts that will further streamline their drones' design and functionality. Blueflite is confident that with HP's ongoing support and advancements in 3D printing technology, there will be opportunities for further growth and innovation.

By fostering a global supply chain and reinvesting savings into dedicated HP equipment, Blueflite aspires to maintain its trajectory as a leader in UAV innovation. Its use of HP Multi Jet Fusion technology has already uncovered new opportunities for complex part design and localized production, setting the stage for a future where drones are not only tools for delivery but also symbols of technological prowess and thoughtful engineering.

To learn more about Blueflite and their innovative solutions for the UAV industry, visit https://www.blueflite.com/.

For more information on how HP Multi Jet Fusion 3D printing is empowering companies like Blueflite to build strong, lightweight, and durable solutions, please visit us at https://www.hp.com/us-en/printers/3d-printers/products/multi-jet-technology.html.

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