Achieve New Heights with HP Multi Jet Fusion (MJF) Technology

A brief guide to how HP MJF is transforming the UAV landscape.

At HP, we're proud to empower a growing global community of drone manufacturers. Leveraging HP Multi Jet Fusion (MJF) technology, the drone industry is accelerating innovation, shortening time-to-market, and unlocking new design possibilities. HP additive manufacturing solutions enable drone manufacturers to produce components efficiently and cost-effectively, while delivering uncompromising quality. With precision process control, MJF enables ultra-thin walls down to 0.5 mm, paving the way for high-performance, extremely lightweight airframes that maximize payload capacity and extend flight range.

The drone industry relies on a wide range of manufacturing technologies, including composites, metal machining, injected plastics, foams, and 3D printing to produce various components. Traditionally, 3D printing was viewed as a tool for prototyping or spare parts. HP MJF is redefining that perception by enabling true industrial-grade production. Drones built with HP MJF demonstrate that additive manufacturing is no longer a limiting factor.

This paper summarizes the value proposition of MJF technology for drone manufacturing and is part of a broader series, showcasing applications that span from small components produced at mass scale (Paper B) and how it outperforms conventional approaches for Category I, fixed-wing drones (Paper C).

Performance

When choosing a drone manufacturing technology, performance is essential. HP Multi Jet Fusion eliminates the limitations of traditional manufacturing methods, enabling complex, lightweight, and aerodynamically optimized components that meet the most demanding flight requirements. Eradicating the need for support structures, MJF unlocks true design freedom, facilitating the integration of internal channels, part consolidation, and precise optimization for weight and aerodynamics. The result: lighter drones that extend range and improve battery efficiency.

Use case: The Eye Above – BushRanger (Fixed Wing VTOL)

Built for the world's toughest environments, this rugged vertical take off and landing (VTOL) surveillance drone is redefining conservation missions. Over 90% of its structure is 3D printed using HP Multi Jet Fusion, showcasing the power of additive manufacturing at scale. It features a modular airframe with sleek aerodynamics, parts that can be repaired in the field, and extended flight duration, thanks to its ultra-lightweight design.

Explore how HP Multi Jet Fusion can accelerate and simplify your development cycles.
Are you producing Category I, fixed-wing drones with wingspans under 2 meters and MTOW's under 9 kilograms? View Paper C to see how MJF enables a drone with a 1.5 meter wingspan and an empty airframe weight below 500 grams.

Data courtesy of The Eye Above

Cost and Scalability

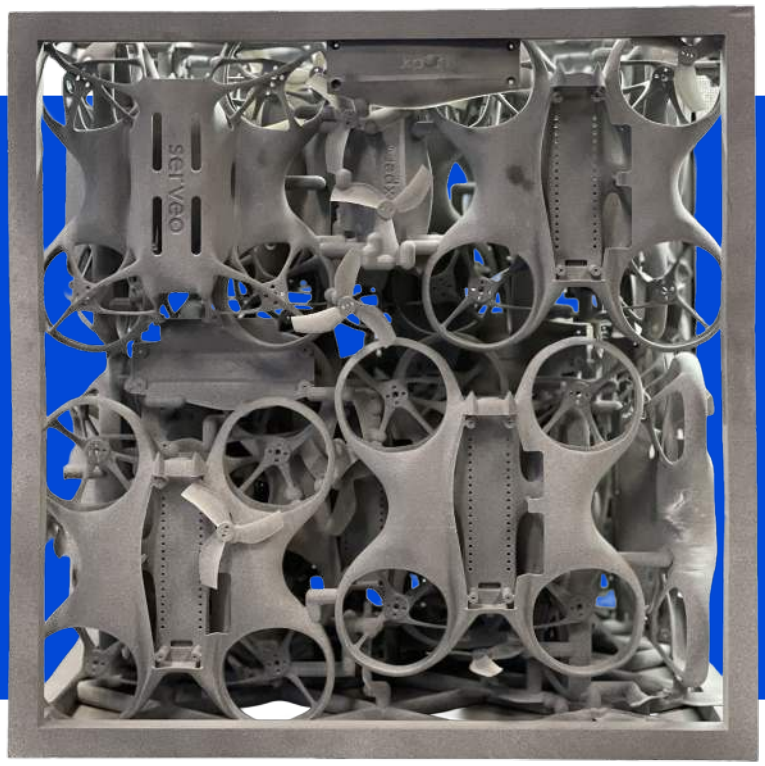
HP Multi Jet Fusion is built for on demand, large-scale manufacturing. Whether you need one part or thousands, MJF consistently delivers high-quality results. It eliminates expensive tooling which removes bottlenecks, reduces lead times, and minimizes supply chain risks. Unlike other 3D printing technologies that struggle with speed, consistency, and cost efficiency at higher volumes, MJF offers reliable, flexible manufacturing that adapts to your production needs, without sacrificing precision or efficiency.

Use case: Serveo – XperDron (Quadcopter)

Serveo utilizes HP MJF to deliver custom drones for industrial inspections. In a single build, each unit can produce enough components for 20 drones, including top shells, bodies, and critical parts. Running two cycles, Serveo combines speed, precision, and scalability, producing up to 40 fully functional drones per day.

If you're making small-to-medium quadcopters or core components for larger drones, explore the benefits of MJF in Paper B. This paper depicts an example of a 260 millimeter quadcopter drone produced with MJF technology, describes how you can use a HP MJF 5600 series printer to achieve a yearly productivity exceeding 200,000 systems, and compares the potential breakeven point with injection molding.

If you manufacture Category I fixed-wing drones with wingspans under 2 meters and MTOW less than 9 kilograms, discover how MJF can streamline your development cycles in Paper C. This document illustrates how the HP MJF 5600 series printer is capable of producing a drone with a 1.5 meter wingspan and describes how its productivity can exceed 1,200 systems per year.



Data Courtesy of Serveo

Accelerated UAV development

With HP Multi Jet Fusion, the same system and material is used from first prototype to final production part. There's no need for different manufacturing methods, which allows engineers to design, test, and refine, rapidly iterating in days instead of weeks. Whether they're optimizing aerodynamics, integrating new payloads, or incorporating feedback from the field, MJF delivers the agility they need to quickly adapt. Without variations in material performance or part quality, drone companies can innovate faster, shorten development timelines, and achieve a seamless path from concept to market-ready components.

Use case: Vecros – Athera (Quadcopter)

Designed for autonomous navigation, obstacle avoidance, and advanced missions such as real-time inspections and 3D mapping, ATHERA is an AI-powered quadcopter that demanded an entirely new, clean sheet UAV architecture. By leveraging HP Multi Jet Fusion, Vecros accelerated development while enhancing both design and durability. With one system and material approach from prototype to final part, they iterated rapidly and accelerated speed-to-market, without sacrificing performance.

Additional resources:

Paper B: UAV components in mass production: From compact quadcopters to core components in large drones, HP MJF delivers performance and cost advantages

Paper C: HP MJF Outperforms Conventional Approaches for Making Category I Fixed-Wing Drones

Already manufacturing drone components? Contact an expert from the HP Drone Team to optimize your parts or learn where to print them.

For more information, please visit the HP Drones website: www.hp.com/drones
or contact us: drones@hp.com

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