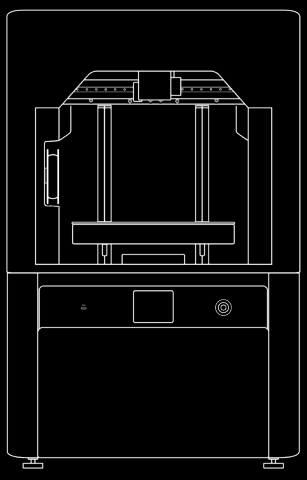
Plane Support

Case Study



Industry: Aerospace and Aviation
Application: Cabin Air Conditioning Ducting
Technology: FX10™
Materials: Onyx FR-A™

Markforged

The Challenge

Markforged, the company strengthening manufacturing resiliency by putting industrial 3D printing right on the factory floor, has announced that Australian aerospace engineering firm Plane Support, in partnership with aerial disaster responder McDermott Aviation, has secured Australian Parts Manufacturer Approval (APMA) from the Civil Aviation Safety Authority (CASA). The landmark certification permits the manufacture of cabin air conditioning ducting for 214B helicopters using additive manufacturing.

This approval highlights a critical breakthrough in aerospace supply chain resiliency. McDermott Aviation operates the world's largest fleet of the Bell 214B—heavy-lift aircraft heavily deployed for aerial bushfire suppression—and holds the aircraft's Type Certificate. With legacy replacement parts increasingly scarce, unserviceable components historically threatened to ground essential emergency aircraft. By shifting production locally to Queensland, the operators have bypassed stalled global supply chains, establishing immediate, on-demand control over fleet readiness.

> "This milestone from Plane Support and McDermott Aviation marks a defining moment for additive manufacturing across the global aerospace sector.
>
> By pairing the industrial precision of the FX10 with the predictive power of Markforged Simulation and the lot-level traceability of our aerospace-grade Onyx FR-A, they have addressed a critical supply bottleneck head-on. They have proven that flight-ready, fully certified composite components can be produced predictably and locally to keep mission-critical aircraft in the air."
>
> — Richard Elving
> Head of Sales - APAC, Markforged



Cabin air conditioning ducting for 214B helicopters 3D printed on Markforged FX10.

The Solution

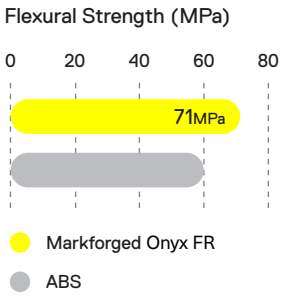
The project signals a shift from rapid prototyping into certified, flight-ready end-use production through advanced material innovation and virtual validation. Plane Support built a dedicated aerospace additive manufacturing laboratory centered on the industrial Markforged FX10 platform. Reverse-engineering the complex internal duct geometry required strict structural verification; the engineering team deployed Markforged Simulation software to analyze and optimize part performance virtually prior to printing.

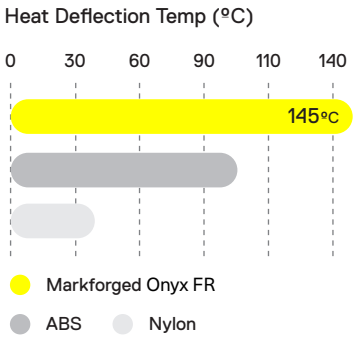
The final ducting is manufactured using Onyx FR-A, Markforged's aerospace-grade, flame-retardant micro-carbon-fiber-filled nylon. Crucially for aviation compliance, Onyx FR-A provides complete lot-level material traceability, delivering the documentation and repeatability required by strict airworthiness frameworks.

> "Ducting sounds simple until you try to reproduce it. These are complex shapes that have to fit exactly and perform in the aircraft just as the originals do, and we had to prove every step of that to CASA.
>
> We didn't have an established process to follow, so we developed our own procedures, quality systems, and inspection methods and worked them through with the regulator. That groundwork now gives us a validated pathway for other components and other aircraft types."

— Jason Hazell
Director of Engineering, Plane Support







Onyx FR-A is purpose-built for the requirements of the aerospace, transportation and automotive industries.

Onyx FR-A materials establish lot-level material traceability.

Markforged Technology Powers Milestone CASA Approval

Developed over nearly two years in direct consultation with the regulator, the initiative sets a benchmark regulatory roadmap.

Plane Support established the procedures, quality controls, and non-destructive inspection methods required under CASA Part 21K from the ground up, proving that industrial composite additive manufacturing can consistently satisfy primary aviation safety standards and paving the way for future component approvals across multiple airframes.

The project was supported by Markforged's Australian reseller partner, Invenio, further reinforcing the local technical expertise and support network driving advanced additive manufacturing in the region.

"An aircraft waiting on a component you can't easily get hold of is an aircraft that isn't working. Being able to have approved parts made here in Queensland gives us far more control over that supply. We own the Type Certificate for this aircraft, so keeping it supported sits with us.

Jason and his team have spent almost two years getting this right, and to now have received CASA approval is tremendously exciting news—not just from our perspective, in terms of the manufacturing capability we are developing here in Australia."

— John McDermott
Founder and President, McDermott Aviation



