COBRA
CASE STUDY

Fuselage Covers for Composite Tiger Drones

Est.1978 40 YEARS COBRA

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A Growing Market

Fixed wing and multi-rotor unmanned aerial vehicles (UAVs - or drones as they are often described) are a rapidly growing market for composite components and structures. Composites provide strength and stiffness, but the key benefit is the ability to build lighter structures allowing heavier payloads to be carried as well as extending the usable flight time of the drone.

Composite Fuselage Cover

In November 2018 COBRA started to work with HG Robotics, a leading drone manufacturer that specializes in UAVs for the agricultural market. Their multi-rotor drones typically carry spraying equipment and can also carry high definition cameras that provide a wide range of field information. Farmers can measure land profiles, identify any problem plants or areas and manage their cultivation in the most efficient way.

COBRA was tasked with developing a production ready composite fuselage cover for the HG's cutting-edge Tiger Drone model. This 420mm square shaped cover protects the drone's electronic controls and forms an aerodynamic fairing between the central fuselage and the crafts 4 rotor arms.

From Design to Production

First steps were for the COBRA Design and Development team to propose a composite laminate based on their extensive library of material properties and lay-ups, and for the team to make first prototype samples for the client. Glass fibre reinforcements were selected (as they don't interfere with GPS signals used by the drone) and combined with epoxy laminating resins in a hand laminated, vacuum bag consolidated production process. Over the next few months, small modifications were made to the composite lay-up and detailed part design and the flight testing was completed.

With component dimensions and tolerances signed off, the production process could begin. COBRA designed all of the mould tools for the project, in this case a 2 piece aluminium mould that was produced by one of COBRA's long term tooling partners. This metallic tooling provides an excellent surface finish to the part with absolutely minimal trimming and finishing required. Moulded parts can go swiftly through a painting and clear coating process before final inspection and delivery to the client.

An Exciting Vision

First production parts were delivered in February 2019. With nearly 100 sets delivered so far, the partnership is going well, and COBRA is hoping to collaborate further with HG Robotics on other multi-rotor and fixed wing VTOL (vertical takeoff and landing) drone models in the future. These are COBRA's first parts for the agricultural industry, and they provide an exciting vision as to just a few of the possibilities for lightweight composites in this area and also in the wider commercial UAV market as a whole.

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