Dassault Falcon Jet

Use Case – ULTEM™ 1010 Resin Composite Tooling

Customer Profile
Dassault Aviation is a French aerospace company producing both military and civil aircraft, including the Falcon series of business jets. With a legacy of innovation and technical investment, Dassault uses 3D printing to optimize its production processes to reduce both lead time and cost.

Challenge
Dassault traditionally used FRP (fiber-reinforced plastic) molds to create composite aircraft structures. However, these tools are expensive and can take months to produce. Additionally, they are heavy and require a forklift to lift and transport. For its Falcon business jets, Dassault sought a more timely and less costly solution to mold the aircraft’s composite interior panels.

Solution
In collaboration with Stratasys, Dassault 3D printed a composite lay-up tool with ULTEM™ 1010 resin. This material can withstand temperatures up to 350 °F (177 °C) and pressures as high as 100 psig (690 kPa), making it capable of withstanding most vacuum-bag or autoclave composite consolidation processes. The tool was printed with a sparse-fill interior construction, reducing its weight, while meeting Dassault’s design requirements of 250 °F (121 °C) and 14.7 psi (101.3 kPa).

Impact
The ULTEM™ 1010 resin tool took approximately three weeks to produce, including all post-print processing. This is a three-month reduction in lead time compared to the time required to produce a standard FRP tool. In addition, the 3D printed ULTEM™ mold saved Dassault nearly $20,000, a 75% cost reduction. The lay-up tool weight was also reduced to only 17 pounds, light enough for one person to move and carry.

Cost Savings  Lead Time Savings
$20K – 75%  3 months – 81%