



## The Next Level

Spanish aerospace engineering and manufacturing specialist, Indaero, offers key leaders in the industry a comprehensive range of services including design, engineering, tooling, welding and painting. The company established itself in the aerospace sector following work for world-leading manufacturer, Airbus.

“As we established ourselves in the aerospace industry, we had two core objectives. We had to improve our long-term strategy to strengthen our position for the next 10 years. To maintain a competitive edge it was essential we optimize our service offering for key customers like Airbus,” said Darío González Fernández, Indaero CEO.

To take their business to the next level, Indaero invested in additive manufacturing. The ability to produce rapid, cost effective low-volume tooling with FDM® Technology meant Indaero could pull away from the competition.

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The 3D printer has been a game-changer for us. The ability to 3D print curved production tools in robust materials made us realize the importance of having tools that perfectly fit the panels. Not only does it make the work of our operators much easier, it frees up resources and increases our overall productivity.”

Darío González Fernández  
Indaero



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“With much of the competition limited to only a few services, we invested in additive manufacturing to not only enhance our processes, but extend into new tooling applications to further differentiate ourselves as an end-to-end, design-to-production service,” said González.

## Tooling On-Demand

FDM materials available on the Fortus 450mc™ 3D Printer are crucial to meeting customer specifications. “It has become an integral part of our production process,” said González. “With its unique combination of high strength-to-weight ratio and FST (flame, smoke and toxicity) certification, we can 3D print robust, lightweight tools and respond to short run production of flying parts, giving us a unique advantage over competition.”

Producing high-volume tooling with traditional methods like CNC machining for the aerospace industry is very time consuming and costly. “With our



Manufacturing tool 3D printed using ULTEM™ 9085 resin enables Indaero to produce complex shapes that perfectly fit the curvature of aircraft panels not possible with traditional aluminum tools.

3D printer, we can service low-volume production quickly and cost-effectively, producing many different tools on-demand to accelerate the manufacturing process and ensure we meet customer delivery deadlines,” said González.

## 3D Printing Complex Geometries

Indaero 3D prints a wide range of production tools, enabling quick design and production of complex geometries that perfectly fit the intricate shapes of aircraft panels. Previously, Indaero was limited to flat shapes using traditional methods, which affected tool performance.

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Indaero redesigned and 3D printed a tool nine kilos lighter than the traditionally manufactured tool.

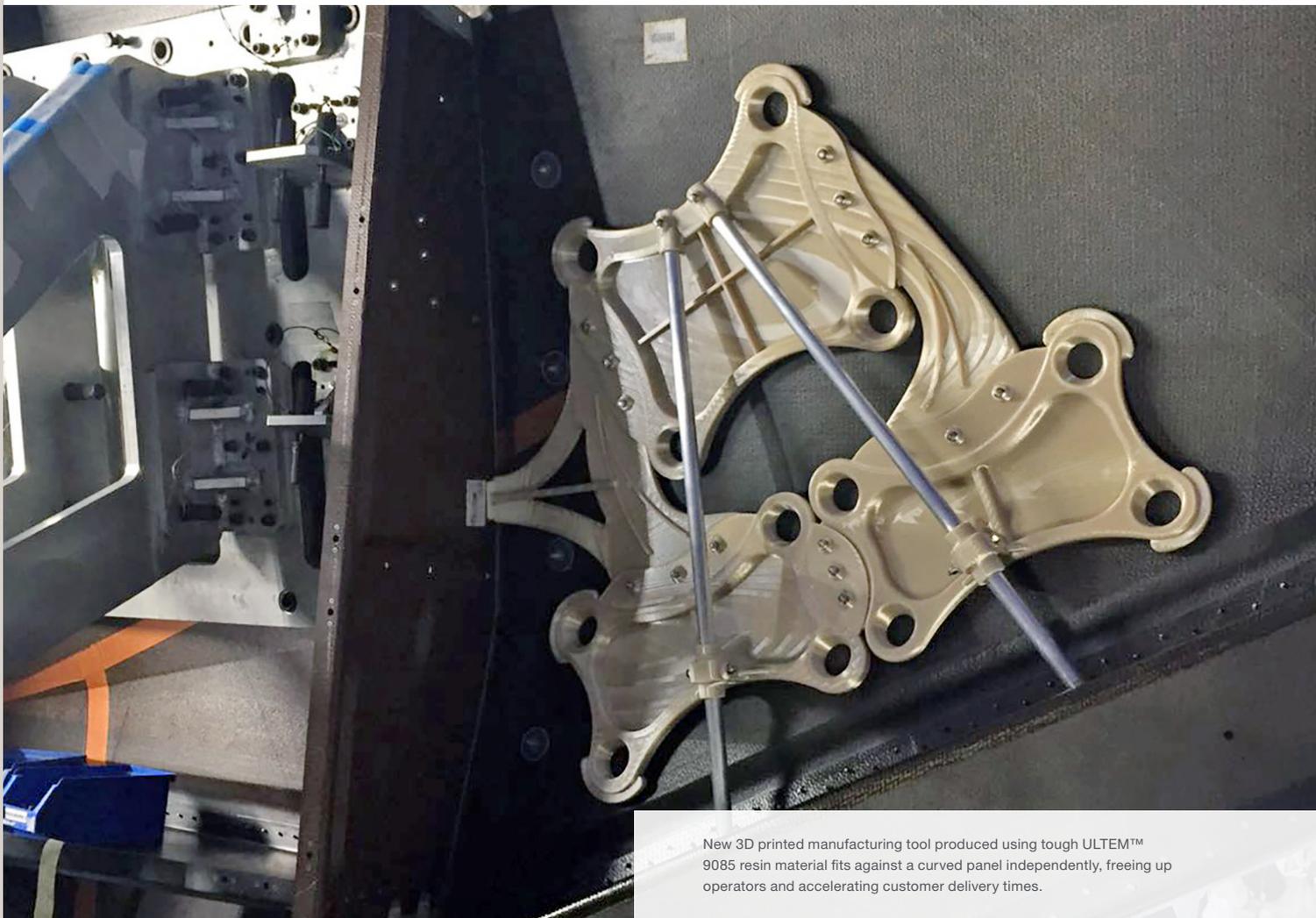
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In a project for Aernnova, an Airbus provider, Indaero used 3D printing to optimize tooling for the manufacture of an Airbus NH90 helicopter. Traditionally, Indaero used aluminum tooling to attach a slide box onto the interior panel of the helicopter wing. Weighing 12 kilos, the tool required two operators to hold it against the panel while marking the drill holes. With 3D printing, the team redesigned the tool with a curvature matching the panel structure and the capability to stand on its own with the help of two aluminum bars. As a result, Indaero provided Aernnova with a more effective tool, nine kilos lighter than its predecessor.

“There is now no need for two operators as the tool fits against the panel independently, leaving one

operator to position the slide box with free hands,” said González. “We can produce a lightweight and robust tool 66% faster than with CNC machining. As a result, this part of the project was completed ahead of time and subsequently led to a reduction in manufacturing cost by over 50%. The customer response has been fantastic.”

Using additive manufacturing for lightweight, complex tools keeps Indaero a step ahead in the aerospace industry. “The future is bright. We are excited to explore how we can further leverage our 3D printer to respond to new engineering challenges our customers face,” said González.



New 3D printed manufacturing tool produced using tough ULTEM™ 9085 resin material fits against a curved panel independently, freeing up operators and accelerating customer delivery times.



#### Stratasys Headquarters

7665 Commerce Way,  
Eden Prairie, MN 55344  
+1 800 801 6491 (US Toll Free)  
+1 952 937-3000 (Intl)  
+1 952 937-0070 (Fax)

stratasys.com  
ISO 9001:2008 Certified

1 Holtzman St., Science Park,  
PO Box 2496  
Rehovot 76124, Israel  
+972 74 745 4000  
+972 74 745 5000 (Fax)

