

AeroLEDs: Lighting a New Way



As private pilots and experienced product development engineers, Nate Calvin, Dean Wilkinson and Mike D'Amico were frustrated with the performance of landing lights in aircraft. "Companies have relied on designs that were originally done in the 50's with little to no innovation. We knew there was a better solution."

Background

Nate and his partners have spent the majority of their careers in aviation. The trio co-founded Sierra Flight Systems, which developed the first synthetic vision EFIS (Electronic Flight Instrument System), shortly after Nate graduated from college. Selling that company, Nate went on to found AeroLEDs to provide the general aviation and experimental aircraft industry with superior lighting solutions. "LEDs make sense for aircraft in many different ways," says Nate. "They use less power than incandescent lighting, and can last the life of an aircraft with better in-service reliability."



3D Prototyping

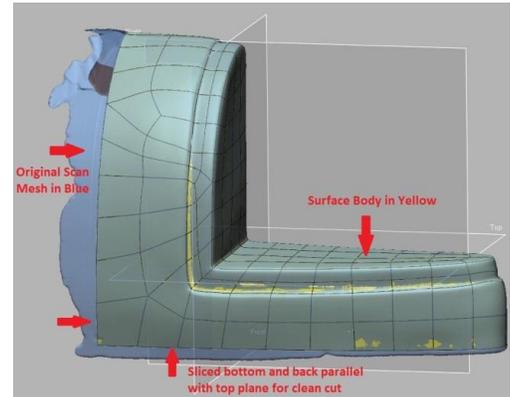
Lighting systems for aircraft use highly precise parts, many with complex spherical shapes. Nate had used 3D printed prototypes in a limited fashion from an out-of-state company, and was glad to find a local resource in Intermountain 3D. After working with the firm on a few projects, he realized that he was getting more than just high-quality prototypes; he was able to have engineering discussions on 3D technologies, materials and design that gave him better information to create new products. "Prior to Intermountain 3D, we used SLA-type printing very sparingly because of cost, time delay and customer service" explains Nate. "With the engineers at Intermountain 3D, we are exploring the boundaries of what iterative 3D prototyping can do, and the results are excellent."



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Scan-Based Design

As AeroLEDs understood the range of engineering services Intermountain 3D provides, they realized they could get help on other projects. One interesting job is the work they're doing with Stene Aviation to develop retrofit wingtip/lighting systems for Cessna series aircraft. Before the project could begin, AeroLEDs and Stene Aviation needed the precise geometric shapes of the various wingtips models.



Using a precision 3D scanner, Intermountain 3D captured the end cap from multiple angles. Next, a highly accurate surface body of the mesh was created before importing the mathematical model into CAD software to deliver to AeroLEDs. "No question that scanning saved us time," said Nate. "We went from concept meeting to production-level parts in 90 days, which included a 10 week tooling period for the various parts. Almost more importantly, though, it gave me confidence that the lighting system we were designing would fit correctly in the end cap area right from the start."

Inspection Scanning

An order for a larger version of a standard light should have been straight-forward, but Nate noticed discrepancies of light output/unit area on the new light. He turned to Intermountain 3D for some help troubleshooting the problem. "One of the most interesting projects AeroLEDs has brought us was a diagnostic evaluation of injection molded parts," said Brian Hoffmann, president of Intermountain 3D. Intermountain 3D scanned in three sets of the smaller light and conducted a statistical analysis to derive the average for the control. They then did a blind scan of six of the new, larger lights and compared the results to the control. "We found some small deviations in the .0002 to .0005 inch range directly as a result of the very precise scanning techniques employed," explains Brian. "While that didn't completely diagnose the problem for Nate, it gave him some clues on where to look next."

Nate has several new projects in development, and expects to continue to rely on the design engineering and 3D printing expertise of Intermountain 3D. "I've started to look at Intermountain 3D almost as an extension of our own engineering team," comments Nate, "and know I can count on them for quality work on tight deadlines."

More information on AeroLEDs and Stene Aviation products can be found at <http://aeroleds.com> and <http://www.steneaviation.com>