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Spotlight on Standards

There are key considerations to bear in mind during the manufacture of aircraft lighting.

By John Fogel

Ensuring each batch of lamps performs consistently is vital.

THE QUALITY of aircraft lighting cannot be overstated. Durable lamps that make the aircraft more visible to other aircraft, improve pilot visibility and provide illumination for specific purposes are critical for the safe and efficient operation of an aircraft. There are four key factors involved in the production of high-quality aircraft lamps that ensure reliability and safety.

The design process

The FAA sets specific requirements for aircraft lighting for operational safety. All aircraft must have approved anti-collision lights and a position lighting system for nighttime operations. The position of lights consists of Aviation Red on the left side, Aviation Green on the right and an Aviation White taillight. Additionally, there are different requirements for different aircraft.

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Materials used to manufacture the best-quality lamps include those that are more resistant to wear.

It is important for a manufacturer to keep detailed documentation throughout the design process to guarantee compliance. Keeping accurate records not only provides transparency, but it also makes it possible to identify any potential issues early in the production process.

Materials matter

High-quality materials can dramatically extend the life of a product and play an essential role in the performance and lifespan of aircraft lighting. Materials used to manufacture the best-quality lamps include those that are more resistant to wear, corrosion and breakage, all of which reduce the need for frequent replacements, a key factor in maintaining operational efficiency and cost savings. For example, using high-grade glass and durable metal alloys can increase a lamp's resistance to environmental stressors, while specialized coatings can improve heat dissipation and protect against chemical exposure.

Batch-to-batch quality

Batch-to-batch quality in lamp manufacturing is crucial for several reasons. Ensuring each batch of lamps performs consistently is vital as variations can lead to differences in brightness, colour, temperature and lifespan. Manufacturers must make certain each batch of lamps meets quality standards and maintains the expected reliability.

Test for safety and durability

Safety is non-negotiable in the manufacturing of aircraft lighting. Each product must undergo rigorous testing to withstand the stresses and hazards of continuous operation in various environmental conditions. Assessments include electrical safety tests, thermal performance evaluations, structural integrity checks, and durability testing—which involves simulating long-term use to assess how the lamp holds up over time, including factors like flicker and lumen depreciation (the gradual dimming of light over time).

These tests reveal potential risks such as electrical shorts, overheating or material weaknesses. Also of concern are environmental conditions such as extreme heat, cold, moisture and UV exposure which can degrade materials over time, making it important to simulate these conditions during development to ensure lamps will function reliably in any weather.

Set standards for today and tomorrow

The goal in manufacturing aircraft lighting is never just about meeting today's needs. It is also about anticipating the challenges and opportunities for improvement going forward. As advancements in technology continue to evolve, so must manufacturing processes to always provide the current best results in efficiency, durability and safety on aircraft worldwide. ■

(John Fogel is Product Manager at Amglo and has worked with the company for more than 15 years in product development.)