Topic 12

Case Study : Dialight

Technical White Paper: Limitations of Dialight Driver-Based Fixtures in High-Temperature Environments

1. Dialight Driver-Based Fixtures Cannot Be Used Above 65 °C Ambient

Based on recent driver reliability and lifetime analyses, Dialight's hazardous-location and industrial lighting products rely on driver-based architectures rated for ambient conditions up to 55–60 °C. Field studies and Arrhenius/De-Facto modeling confirm that once ambient temperature exceeds 65 °C, case temperatures rapidly reach 90–100 °C or higher, causing driver failure rates to increase exponentially.

At 65 °C and above, conventional electrolytic capacitors and MOSFET-based circuits degrade rapidly, resulting in shortened lifespan, high maintenance costs, and significant fire hazards. Therefore, in industrial environments such as steel cooling beds, paper dryer sections, casting and forging zones, and mining or nuclear facilities, Dialight's driver-based solutions are unsuitable.

2. Remote Driver Configurations Are Not a Viable Alternative

Remote driver strategies are sometimes proposed as a mitigation method, relocating drivers to cooler areas. However, this approach presents serious drawbacks:

- • Substantial power cable usage: Long DC cable runs significantly increase installation costs.
- • Voltage drop issues: DC transmission over long distances leads to large voltage drops, requiring oversizing of conductors.
- • Safety concerns: Long-distance low-voltage DC cabling poses fire and electrical safety risks, especially in harsh industrial zones.
- • Energy losses: Power dissipation over extended cable runs reduces system efficiency and reliability.

3. Market and Safety Implications

In environments where ambient temperatures exceed 65 °C, using Dialight's conventional driver-based fixtures is not only technically unsuitable but also represents a safety and insurance liability.

Facilities must adopt driverless solid-state solutions capable of continuous operation at ≥115 °C, such as ACCOB-based architectures (TTL – Touch the Limit, ParagonLED inside). These eliminate the driver failure bottleneck, avoid excessive cable infrastructure, and provide compliance with NFPA/UL standards in extreme environments.

4. Conclusion

Dialight's driver-based fixtures, while functional in moderate environments, cannot be deployed in high-temperature industrial or hazardous-location applications where ambient

temperatures exceed 65 °C. Remote driver configurations are costly, inefficient, and unsafe. The only sustainable path forward is adopting driverless ACCOB solutions designed for operation up to 145 °C, ensuring long-term reliability, safety, and compliance.