

Thermal Design of an Automated Washlight



Case Study

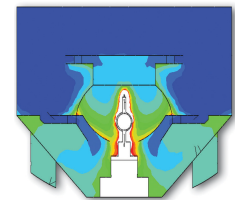
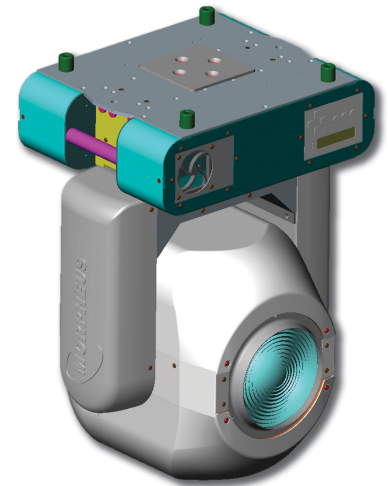
OVERVIEW

The PanaBeam™XR2 is a 1,200 W high-performance automated washlight from Morpheus Lights for professional users in the entertainment industry. It features a combination of beam modification and motion control capabilities using a high-performance drive system. Morpheus Lights contracted ATA to perform thermal design and analysis of this high-powered system.

In five weeks, ATA performed more than thirty full-scale calculation runs, covering a large spectrum of design iterations. ATA provided Morpheus Lights with a successful design and recommendations for further performance improvements. These recommendations provided cost-effective options should thermal design specifications be revised in the future. The final design achieved minimal noise and low manufacturing cost and met all thermal requirements, including those under adverse environmental conditions.

TASKS PERFORMED & KEY OUTCOMES

- Thermal analysis including simultaneous treatment of all modes of heat transfer
- Developed a model of the bulb and correlated it to test results.
- Performed detailed flow analysis throughout the structure and determined thermal stresses on high-temperature components.
- Assisted Morpheus Lights with manufacturing considerations.
- Compiled comprehensive analysis results for both typical and worst-case operating conditions.



Internal airflow thermal contours predicted using detailed coupled fluid/thermal analysis