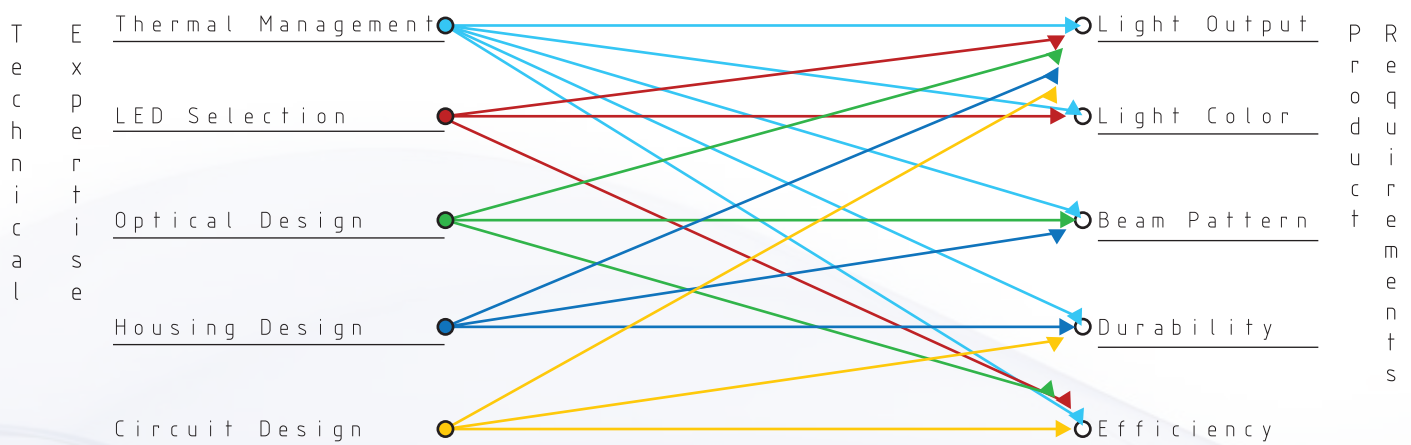




## LED Lighting Selection and Design

Boatbuilders today are being offered an ever widening array of LED lighting choices. Selecting the right luminaire for a given location can be a daunting task. Unlike conventional incandescent lights, seemingly similar LED luminaires can differ greatly in terms of their expected service life, their efficiency, and the overall usability or efficacy of light output. Further complicating matters, the efficacy of light output is affected by several factors, including: the intensity of the light generated by the diode(s) inside the luminaire; the color of the light generated; and the beam pattern of the light as it exits the fixture.

Lumitec luminaires are designed with a comprehensive knowledge of these factors. At inception we define requirements for the luminaire's intensity, light color, beam pattern, service life, and overall efficiency. The graphic below and information on the reverse outlines how Lumitec designs to these requirements.



### Thermal Management

Contrary to popular belief, LED lighting devices actually generate more heat than comparably powered incandescent fixtures. Effectively managing this heat is one of the greatest challenges of LED luminaire design. As individual diodes heat up light output drops, output color can change, and the expected life can be greatly reduced. Specialized software applications allow us to understand the thermal dynamics of a lighting system. Our on-site machine shop and prototype lab enables us to rapidly test design concepts in real world conditions. Lumitec is an innovator in developing effective ways to move heat from the junction of the diodes to the ambient air.

### LED Selection

There are tens of thousands of LED emitters on the market today. These products vary wildly in terms of their size, light output, light color, power dissipation, luminous efficiency, thermal resistance, and cost. Lumitec's staff of engineers is well versed in these selection criteria. Moreover, we are afforded on-site support from engineers from the top diode manufacturers in the world. This allows us to select the best emitters for a given application, and ensure that we are offering our customers the most current technology in this rapidly changing field.

### Optical Design

Effective optical design is critical to the overall efficacy of the light. "Hot spots" on a light create irregular contrasts and shadows and induce eye fatigue. Not properly collimating (or focusing) a light can lead to inadequate light where it is needed. The optical system of each Lumitec luminaire is carefully engineered to provide the best light pattern for the intended application.

### Housing Design

Naturally the aesthetic appeal of our luminaires is the most immediately appreciable. But the beauty of the housing is far more than superficial. Our luminaires are designed to be easy to mount, highly resistant to weather, wear and impact, and easy to use. In all cases the housing is an integral part of the overall thermal management system. Materials and finishes are carefully selected and designs artfully crafted to ensure the optimal balance between form and function.

### Circuit Design

Lumitec does not use "off the shelf" drive circuits. Each luminaire we produce utilizes a highly specialized drive circuit optimized for that luminaire's intended use and installation. Our on-site electrical lab enables us to quickly develop and test circuitry to ensure it will stand up to the rigors of the marine environment. Domestic suppliers ensure high quality and very rapid response to changing market demands.