

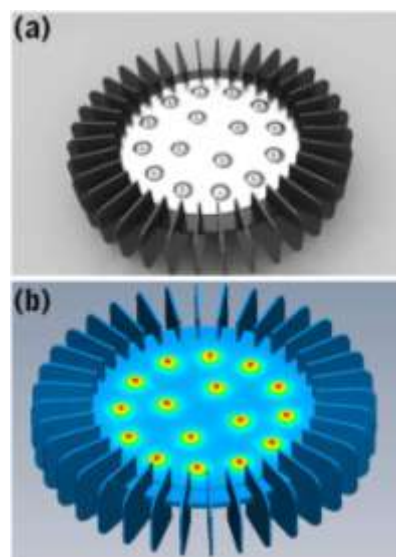
## TERMOLED: Thermal management of solid state lighting

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Light Emitting Devices (LEDs) are generally accepted as being a technology offering a high potential for energy savings and to enhance the quality of illumination. Unfortunately, as every form of electric lighting, LEDs produce an undesired by-product: heat. Whereas in standard incandescent or fluorescent fixtures there is a long record of reliable solutions for heat dissipation, LED-based systems, appearing today in growing quantity and variations, pose new and different challenges. In fact, at present, thermal management is considered by engineers in the field the most crucial aspect of LED system design. In the short term, heat causes color shift, which leads to variations in comfort and quality. In the long term, the effects are even more important. Heat buildup induces accelerated reduction in light output, which results in shortened component's lifetime.

In order to save design iterations and, thereby, minimizing costs, manufacturers and components suppliers have realized the necessity of identifying and resolving thermal issues in the early stages of the design process. To do so, a new generation of computational fluid dynamics (CFD) software has been introduced, which can easily provide an accurate description of thermal management in different designs.

In this framework, the IREC Lighting Group, in collaboration with a private institution, is leading a project called TERMOLED. In this project, Lighting Group will assist manufacturers and designers in the design of new innovative products in developing thermally efficient luminaires.



**Figure 1.** CFD Simulations. (a) Example of LED-based fixture. (b) Thermal management simulation

### Objective:

Validation and optimization of thermal management solutions in solid state luminaires.

### Application:

This project is addressed to luminaire designers and manufacturers interested in CFD optimization of their concepts.

### Project Dates:

November 2011- July 2012

### Sponsor:

Private funds (Confidential)