

LED lighting module design based on a prescribed candle-power distribution for uniform illumination

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Abstract

A simple approach is presented to design an LED lighting module to provide a uniform illumination. The reflector of the module is designed using a prescribed candle-power distribution to achieve a uniform illumination on a target surface. Both the design methodology and the construction of the reflector are stated in detail. The optical efficiency and uniformity of the module are calculated according to a ray-tracing result. In addition, the effects of the reflector's aperture and the LED chip size on the optical efficiency and uniformity are also investigated that the result can provide a reference to LED-luminaire designers and manufacturers.

Key words : Freeform surface; LED; Reflector; Uniformity