Recommended Practice for Photobiological Safety for Lamps and Lamp Systems – General Requirements
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- General Requirements

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1.0 INTRODUCTION

Lamps were developed and produced in large quantities and became commonplace in an era when industry-wide safety standards were not common. The evaluation and control of lamp hazards is a far more complicated subject than similar tasks for a single-wavelength laser system. The required radiometric measurements are quite involved, for they do not deal with the simple optics of a point source, but rather with an extended source which may or may not be altered by diffusers or projection optics. Also, the wavelength distribution of the lamp may be altered by ancillary optical elements, diffusers, lenses, and the like, as well as variations in operating voltage.

To evaluate a broad-band optical source, such as an arc lamp, an incandescent lamp, a fluorescent lamp, an array of lamps or a lamp system, it first is necessary to determine the spectral distribution of optical radiation emitted from the source at the point or points of nearest human access. This accessible emission spectral distribution of interest for a lighting system may differ from that actually being emitted by the lamp alone due to the filtration by any optical elements (e.g., projection optics) in the light path. Secondly, the size, or projected size, of the source must be characterized in the retinal hazard spectral region. Thirdly, it may be necessary to determine the variation of irradiance and projected radiance (see Glossary) with distance. The performance of the necessary measurements is not an easy task without sophisticated instruments. Users must normally rely upon the expertise of manufacturers for information on lamps and lamp systems. Safety requirements and reference measurement techniques for lamps and specific lamp systems are provided in later standards of this series, viz., RP-27.2, RP-27.3...

Finally, there are well known optical radiation hazards associated with some lamps and lamp systems. The purpose of these standards is to inform the public and original equipment manufacturers (OEMs) about potential radiation hazards that may be associated with various lamps and lamp systems. It is also the purpose of these standards to provide guidance, advice, and standard methods for evaluating and informing the user, both the public and the OEM, about the potential optical radiation hazards that may be associated with these products.