

Use of Spectral Weighting Functions for Compliance with IES Recommendations (PS-02-09)

The lighting industry has historically held that electro-magnetic radiation becomes "light" when it stimulates human retinas. Numerical conversion from radiation to light has been made using the photopic luminous efficiency function, $V(\lambda)$, which produces the unit known as the lumen, and subsequently all other photometric units such as the candela.

Recent developments have indicated that the radiation that produces human visual sensation may be usefully evaluated using other spectral weighting functions, such as the scotopic luminous efficiency function. This has led to current research into possible alternatives to the historical definition of light in terms of photopic lumens, which in turn has led to some confusion about the weighting of optical radiation which is appropriate for compliance with IES published criteria.

This document is intended to clarify this confusion.

Research into the suitability of using weighting functions other than the photopic luminous efficiency function is ongoing. At present the research is not considered sufficient to support the application of any alternative to photopic luminous efficiency function.

Accordingly, it is the policy of the IES that for compliance with all IES recommendations, photometric quantities shall be calculated using the photopic luminous efficiency function as defined in the IES Lighting Handbook, unless specifically stated in the IES document that contains the recommendations. This policy applies to all photometric units, such as lux or candela per square meter, and all standards, existing and future.

Whenever recommendations are to be based on an alternative visual sensitivity function, that alternative shall be included with the specific recommendations as they are generated, reviewed and approved by IES. For compliance with IES recommendations, no revision or substitution of the specified visual sensitivity function shall be made after IES publication.

About the Illuminating Engineering Society

The IES is a collegial community dedicated to improving the lighted environment. The IES is composed of a diverse membership, all with an interest in and a dedication to good lighting. 25% of the membership is involved in manufacturing (lamps, sources, luminaires, accessories); another 25% is composed of lighting designers and architects. The remaining 50% is composed of consultants, electrical and building contractors, distributors, and wholesalers, individuals working in affiliated lighting fields, those working for utilities and energy services, and people in government and education. Over one thousand of these members serve on committees, most serving on the Society's document development committees; these committees develop standards, design guides, technical memoranda, lighting energy management materials, guidelines and lighting measurement, testing and calculation guides.