

OPTICAL RADIATION SAFETY REQUIREMENTS FOR ELECTRICALLY POWERED PRODUCTS EMITTING OPTICAL RADIATION

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Optical radiation hazards from all types of lamps or other broadband light sources are assessed by the application of IEC Standard 62471, Edition 1, 2006, "Photobiological Safety of Lamps and Lamp Systems". IEC 62471 covers LEDs as well as incandescent, low and high pressure gas-discharge, arc and other lamps i.e. all types of electrically-powered optical radiation sources. The standard provides a risk group classification system regarding optical radiation hazards, and the applicable assessment conditions are well developed. The assigned risk group of a product may be used to assist with risk assessments, e.g. for occupational exposure in workplaces or it may be used for conformity presumption in conjunction with essential product safety requirements.

IEC 62471 does not include manufacturing or user safety requirements that may be required as a result of a lamp or lamp system being assigned to a particular risk group. The safety requirements for lamp systems necessarily vary and are best dealt with in "vertical" standards. The requirements in the "vertical" standards may limit the source risk group that can be used in a given application; may require a specific performance feature based upon the risk group specifications; or may specify application-specific control measures including labelling requirements. In this context, IEC 62471 should be considered as a "horizontal" standard, providing the base for risk group classification and for the development of application-related "vertical" standards. This base standard is currently under revision and will be published soon (technically unchanged) as IEC 62471-1 ("part 1") opening a new series "optical radiation safety of electrical products". Similar as in the "laser safety series" IEC 60825, future "vertical" application-related standards as well as supporting technical reports or specifications should be published consecutively as parts of this new "lamp safety series".

In the absence of application- or product-specific "vertical" standards, guidance is already available in the (Draft) Technical Report IEC TR 62471-2 ("part 2") "Guidance on manufacturing requirements relating to non-laser optical radiation safety". It provides the basis for safety requirements dependent upon risk group classification and examples thereof. Although specific details may depend upon the application and should be specified in application-specific "vertical" standards, this Technical Report specifies also the labelling requirements – in order to provide a common and consistent approach across applications or products. Rough guidance for the development of application-related "vertical" standards, based on the likelihood of direct source viewing, is also provided. A number of specific issues, such as the determination of hazard distances, the implications of "beam-shaping" optics or the effect of the "GLS (general lighting service)-requirement", are addressed in some annexes. Based on these two first parts of the "lamp safety series", this contribution presents the current status of the optical radiation safety requirements for products.