

Valutazione dell'esposizione alla radiazione laser nei laboratori di ricerca

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SUMMARY

«Assessment of exposure to laser radiation in research laboratories». *The problem of laser safety is now topical due to the wide use of laser systems in different working environments. The program of prevention and protection prescribed by law 626/94 gives general rules for the elimination (where possible) and/or reduction of risk factors. For this purpose, it is important to determine the parameters that characterize such risks. The Maximum Permissible Exposure (MPE) and the Nominal Ocular Hazard Distance (NOHD) are the most important parameters of laser safety. The evaluation of these parameters requires a detailed knowledge of the standards and of the various techniques which are necessary to measure them. In particular, the MPE parameters are obtained by CEI EN 60825-1 standard in relation to wavelength and emission duration of the investigated laser. Exposure to laser radiation is usually measured in terms of irradiance (W/m^2) or radiant exposure (J/m^2). The experimental values of irradiance must be compared with the MPE parameters obtained by safety standards. When the values of irradiance exceed the MPE parameters then the NOHD values must be calculated. The aim of this paper is to offer a general view of the methods for measuring the above-mentioned parameters for the laser sources that are most widely used in research environments and to compare such parameters with those recommended by safety standards. Our results indicate that for almost all the laser sources analysed, the measured exposure values were greater than the MPE recommended by standards, both for eyes and skin. High values of NOHD indicate that it is necessary to use eye protection, beam stops or attenuators at the end of the useful beam path in normal working conditions and especially in research laboratories in which these conditions can often change.*

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