



International Light, Inc. has been manufacturing light measurement instrumentation for almost 40 years. We offer a full line of hazard testing equipment including our IL1700 Research Radiometer, IL1400 Handheld Radiometer and our new "RPS" line of Hand Held Portable Spectroradiometers. All I.L. Radiometer and Spectroradiometer systems come with NIST traceable calibrations suitable for testing UV actinic skin and eye hazard, Blue eye hazard, Near IR retinal hazard, IR cornea hazard and total UV hazard for XP.

OPTICAL RADIATION HAZARD

APPLICATION	COMMON SOURCES	ACGIH SPECTRAL RANGE	I.L. PRODUCTS	I.L. MEASUREMENT RANGE	UNITS
UV HAZARD UNPROTECTED SKIN AND EYE HAZARD	MANUFACTURING GERMICIDAL LAMP WELDING OFFICE LIGHT, COPIER SOLAR SIMULATOR	180-400 nm *	RPS200 Spectroradiometer, customized spectrum, spectral irradiance in W/cm ² /nm		
			IL1700, SED240/ACT5/W IL1400, SEL240/T2ACT5	5.0e ⁻⁰⁹ to 2.5e ⁻⁰³ 2.5e ⁻⁰⁷ to 2.5e ⁻⁰³	W/cm ² W/cm ²
Xeroderma Pigmentosum EXTREME SENSITIVITY TO ANY UV LIGHT	ANYSOURCE EMMITTING ANY UV LIGHT	250-400 nm *	RPS200 Spectroradiometer, customized spectrum, spectral irradiance in W/cm ² /nm		
			IL1700, SED005/WBS320/W IL1400, SEL005/WBS320/TD	2.3e ⁻⁰⁹ to 2.3e ⁺⁰ 1.8e ⁻⁰⁷ to 6.4e ⁻⁰¹	W/cm ² W/cm ²
BLUE "EYE" HAZARD RETINAL PHOTOCHEMICAL PROTECTION	WELDING LED'S SOLAR LIGHT HIGH POWERED VIS MANUFACTURING LASERS	305-700 nm *	RPS380 Spectroradiometer, customized spectrum, spectral irradiance in W/cm ² /nm		
			RPS900 Spectroradiometer, customized spectrum, spectral irradiance in W/cm ² /nm		
			IL1700, SED033/SCS395/TBLU/TD IL1700, SED033/SCS395/TBLU/R	5.2e ⁻¹⁰ to 5.2e ⁻⁰¹ 5.5e ⁻⁰⁹ to 5.5e ⁺⁰	W/cm ² W/cm ² /sr
			IL1400, SEL033/SCS395/TBLU/TD IL1400, SEL033/SCS395/TBLU/R	2.6e ⁻⁰⁸ to 9.2e ⁻⁰² 2.7E ⁻⁰⁷ to 9.7e ⁻⁰¹	W/cm ² W/cm ² /sr
CATARACT SURGERY HAZARD POST SURGURY RISK	SOLAR LIGHT HIGH POWERED VIS MANUFACTURING LASERS WELDING	305-700 nm *	RPS380 Spectroradiometer, customized spectrum, spectral irradiance in W/cm ² /nm		
			RPS900 Spectroradiometer, customized spectrum, spectral irradiance in W/cm ² /nm		
IR-A NEAR IR RETINAL PROTECTION PROTOCOL	IR HEAT SOURCES MANUFACTURING LASERS	770-1400 nm *			
			IL1700, SED007/W IL1400, SEL007/W	7.1e ⁻¹¹ to 7.1e ⁻⁰² 3.5e ⁻⁹ to 1.2e ⁻⁰²	W/cm ² W/cm ²
IR HAZARD CORNEA THERMAL INJURY	IR HEAT SOURCES MANUFACTURING LASERS	770-3000 nm *			
			IL1700, SED623/SCS695/W IL1400, SEL623/SCS695/W	8.5e ⁻⁰⁵ to 9.5e ⁻⁰¹ 8.5e ⁻⁰⁵ to 4.1e ⁻⁰¹	W/cm ² W/cm ²

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HEALTH AND SAFETY ASPECTS OF OPTICAL RADIATION

Light, or visible radiation, is defined as that portion of the electromagnetic spectrum to which the human eye is sensitive. In addition to the visible region of approximately 400 to 700 nanometers, certain portions of the ultraviolet (180-400 nanometers) and the infrared (700-1400 nanometers) are normally associated with light when considering the biological effects produced by optical radiation. The entire spectral region from 180 to 3000 nanometers may then be considered as the region of optical radiation.

Sources emitting optical radiation are of paramount concern to hygienists, safety engineers, and public health officials, both from their beneficial effects and their potential as a hazard to health and safety. Illumination produced by visible radiation has constantly been a concern because of its obvious effect on human health, safety, psychology, productivity and comfort. Recent years, however, have brought the advent of a great number of new sources of optical radiation to the human environment. The hazards presented by these sources are in the nature of the physiological and biological reactions they produce and are usually more subtle than the obvious hazards of illumination. Among the examples of these sources now prevalent in the human environment are lasers, mercury, xenon, and quartz halogen lamps, welding devices, infrared lamps, solar simulators and germicidal sources.

Such sources are found in office copy machines, water treatment plants, hospitals, research laboratories, photo-etching production lines, graphic arts facilities, machine shops, on the street and in the home.

Some of the harmful effects which can be produced by these sources include erythema, photokeratosis, skin cancer, depigmentation, conjunctivitis, and temporary or permanent loss of vision. Long, continuous, or repetitive exposure to low level sources may produce cumulative damage such as cataracts, blindness and cancer.

There are two sets of standards, each with their own units, which apply to the measurement of optical radiation. They are the photometric and the radiometric standards. Photometric standards and units are based upon the spectral response of the human eye and should only be used in applications involving illumination and human vision. By definition, these units can only be applied to the visible portion of the spectrum (400-700 nm). All applications other than vision and illumination, including all applications in the ultraviolet and infrared, require the use of radiometric units.

and physical agents. *The International Commission on Non-Ionizing Radiation Protection* (www.icnirp.de) is a body of independent scientific experts who's principal aim is to disseminate information and advice on the potential health hazards of exposure to non-ionizing radiation to everyone with an interest in the subject. ICNIRP offers occupational practical guides, reviews of the published scientific literature and exposure guidelines. *NIOSH - The National Institute for Occupational Safety and Health* (<http://www.cdc.gov/niosh/homepage.html>) is part of the CDC. NIOSH is the main US federal agency responsible for conducting research into occupational safety and health matters. (www.cdc.gov/niosh/homepage.html)

