



SPECTRONICS CORPORATION

956 Brush Hollow Road, P.O. Box 483
Westbury, New York 11590
800-274-8888 • 516-333-4840
Fax: 800-491-6868 • 516-333-4859
www.spectroline.com

TECHNICAL BULLETIN #103

SAFETY PRECAUTIONS FOR USE OF HIGH-INTENSITY LONG WAVE ULTRAVIOLET (BLACK LIGHT) LAMPS

Long wave ultraviolet (also known as black light or UV-A) emissions typically range from 320nm to 400nm in the electromagnetic spectrum. Although long wave UV emissions are known to be relatively safe compared to other ultraviolet emissions, it is necessary for all operators and supervisors to observe certain safety precautions when working with high-intensity UV-A sources.

Personnel using high-intensity long wave UV lamps should avoid looking directly at the sources, as this can cause fluorescence of the eyeball. This would result in lowering the ability of the user to detect the fluorescent response. The filter used with UV-A sources, either as an integral part of the bulb/tube or as a separate component, should always be maintained in good condition and free from cracks, as radiation at wavelengths below 320nm can be very dangerous.

It is a good practice not to shine high-intensity UV-A sources onto exposed skin, especially when the user is taking certain medications which produce increased photosensitivity to UV. Such exposure can cause skin irritation. It is recommended that users wear long-sleeve, nonfluorescent clothing and nonphotochromic goggles when performing inspection. The goggles should possess UV-blocking capabilities; the transmission in the long wave UV region should be better than 10⁻⁴.

The threshold limit values published by the American Conference of Governmental Industrial Hygienists (ACGIH) for occupational exposure to UV-A radiation states that the total irradiance incident upon the unprotected eyes should not exceed 1mW/cm² for periods greater than 1,000 seconds (approximately 16 minutes). For exposure times less than 1,000 seconds, the total UV-A dosage should not exceed 1Joule/cm² (Joule = watts x seconds). Exposure of the unprotected eyes or skin should not exceed the values below.

Ultraviolet Radiation TLV		
Wavelength (nm)	TLV (J/m ²)	TLV (mJ/cm ²)
320	2.9 x 10 ⁴	2.9 x 10 ³
322	4.5 x 10 ⁴	4.5 x 10 ³
323	5.6 x 10 ⁴	5.6 x 10 ³
325	6.0 x 10 ⁴	6.0 x 10 ³
328	6.8 x 10 ⁴	6.8 x 10 ³
330	7.3 x 10 ⁴	7.3 x 10 ³
333	8.1 x 10 ⁴	8.1 x 10 ³
335	8.8 x 10 ⁴	8.8 x 10 ³
340	1.1 x 10 ⁵	1.1 x 10 ⁴
345	1.3 x 10 ⁵	1.3 x 10 ⁴
350	1.5 x 10 ⁵	1.5 x 10 ⁴
355	1.9 x 10 ⁵	1.9 x 10 ⁴
360	2.3 x 10 ⁵	2.3 x 10 ⁴
365	2.7 x 10 ⁵	2.7 x 10 ⁴
370	3.2 x 10 ⁵	3.2 x 10 ⁴
375	3.9 x 10 ⁵	3.9 x 10 ⁴
380	4.7 x 10 ⁵	4.7 x 10 ⁴
385	5.7 x 10 ⁵	5.7 x 10 ⁴
390	6.8 x 10 ⁵	6.8 x 10 ⁴
395	8.3 x 10 ⁵	8.3 x 10 ⁴
400	1.0 x 10 ⁶	1.0 x 10 ⁵