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## UV & BLACKLIGHT EFFECTS

### UNDERSTANDING ULTRAVIOLET LIGHT

Black light fixtures use invisible ultra-violet radiation (UV) to create special effects with UV reactive materials. Ultra-violet radiation is part of the electromagnetic spectrum just below visible light and above x-ray radiation. Ultraviolet radiation is classified into three types based on its wavelength. UV light above 315 nano-meters is relatively safe for human exposure and is the type of UV radiation emitted by most blacklight fixtures.

Visible Light	400 - 700 nm	
Ultraviolet - A	315 -400 nm	Safe range
Ultraviolet - B	280 - 315 nm	Limited exposure
Ultraviolet - C	100 - 280 nm	Harmful

All ordinary fluorescent lamps produce UV radiation which is then used to produce visible light by coating the inside of the glass with a phosphorescent material. This coating is excited by the UV radiation and then emits what we see as white light.

A fluorescent blacklight tube works the same way only without the coating. The glass is colored purple or blue to mask any visible light that is emitted along with the ultraviolet radiation. It is exceedingly difficult to produce a lamp that will produce only the exact wavelengths you want, therefore nearly all blacklights produce some level of visible light. How much visible light your effect can tolerate should determine the type of fixture you use

The effectiveness of a blacklight is determined not only by the amount of UV radiation emitted, but also by its ability to restrict the amount of visible light spilled at the same time. In the fluorescent tube for example, we noted that the glass is tinted purple or blue. This does not block the visible light but simply produces a more subdued tint. This is critical if there are objects or people in the background that you do not want exposed within your effect. Fluorescent fixtures would illuminate even black objects with this blue light.

Better quality fixtures employ powerful lamps (250 - 600 watts) and sophisticated filters to block more visible wavelengths as well as any harmful UV radiation below 315nm. This type of fixture works better over longer distances and is a better choice for stage and theatrical work since it will produce minimal visible light and high levels of UV radiation.

Keep in mind however that most professional grade fixtures require a large transformer/ballast and can weigh

over 30 pounds. Always use appropriate rigging and safety cables for the type of fixture you are using.



Above: 400 watt medium throw semi-pro blacklight spot.

Fixture type	Power ( watts )	Application
Fluorescent	15 - 40	Amusement, display
Incandescent	15 - 75	Retail, display
Halide lamps	250 - 600	Theatrical effects

Below: 400 watt long throw professional blacklight flood.

