

THE MAGIC BOX: A MODERN FABLE

By Mick Orr
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Once upon a time, a poor screenmaker in the Giant's print shop had to burn some screens. He put them one at a time into the exposure box. After they were exposed he washed them out and dried them. All of them were rejected by the wicked QA inspector. The Giant was not happy with the news from the wicked QA inspector. The Giant wanted to know why his screens weren't done right. The poor screen maker could only shrug and say in a whimper, "I don't know." So the Giant ate him. The End.

Exposure units can seem like a magic box if you don't know how and why they work.

The only way to expose a screen is to use ultra violet light. No other type of light is going to make a stencil, it has to be UV. Almost all lights give off ultra violet energy; some give off a lot, some give off a little. What you need to know is which one will work best for your application.

Two things must come together to have an exposure: The sensitizer of the film or emulsion and the bulb used in the exposure unit. The closer they match the better the stencil is exposed.

As long as the greatest UV energy is between 350 and 420, the exposure unit will work with today's emulsions and films.

Let's look at some of the different kinds of exposure equipment (boxes) available.

Fluorescent light units. Don't be confused with the lights found in the ceiling. These exposure units use unfiltered black lights that are rich in ultra violet energy. They typically don't work as well as a single light because of the light scatter caused by multiple bulbs and the low energy output. Screens must be put very close to the lights to properly expose. The screen will also not have as sharp a stencil as a point light source. If you can live with these limitations a fluorescent light source will do fine. They are usually less expensive than point light sources.

Mercury Vapor units. These units are usually around 1000 watts and work very well. Rich in ultra violet light, mercury vapor lights can be classified as a point light source. As I have already stated, point light sources give better stencil definition than fluorescent units because they use only one point of light. As long as the light is close to the screen, it will work admirably. Usually, the screens should be placed no further than two feet away from the unit. Any farther away and you will end up with excessively long exposures. Mercury vapor lights have a start-up time and a cool down time. No instant on/instant off like you get with a fluorescent unit. These are moderately priced.

Metal Halide exposure units. These units are top of the line and command the highest price. Similar to the mercury vapor units, this type is also a point light source. Metal halide also shares the need for a warm up and cool down time and cannot be turned on and off like a light bulb. Many metal halide exposure units will use a shutter that will open and close on command. They range anywhere from 1000 watts to 10,000 watts in power. The higher powered units can usually handle any exposure requirement efficiently.



Looking for insight on the wonderful world of screen making? Consult the writings of Chromaline's Technical Guru, Mick Orr, Applications Training Specialist.

Mick has been in the screen printing industry since 1970 with printing experience in a wide range of applications from membrane switches, to textiles, specialty graphics to faceplates and more. His hands-on seminars have been appreciated by screen makers around the world.



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If you plan on making your own exposure unit, be careful! You must make sure to use the right type of light bulbs. Don't use halogen, daylight bulbs, gro lights, or metal halide bulbs designed for flood lights, that can be purchased at hardware stores.

I know what you're thinking. Didn't I just tell you that metal halide exposure units are the best? The key words here are "exposure unit." The ones used in exposure units use the correct bulb with the proper wave length. All bulbs or lamps give off light but not necessarily the right amount of ultra violet light in the correct wave length. Finding out from the manufacturer of these types of bulbs, or lamp if they are rich in the proper wavelength of UV is next to impossible.

Before you try to make your own exposure unit, check out a manufactured one. If you add up the cost of the components; bulbs, ballasts, transformers, vacuum motors, capacitors, glass, metal, blood, sweat, time and the chance that it won't work anyway, you may find out that a manufactured one isn't that expensive after all. Say that you do make your own exposure unit and it doesn't work. What do you do? Call yourself up and demand that it be fixed?

All exposure units are not equal. Some expose quickly and accurately, some just quickly. What you must do is choose the one that will satisfy your needs. Next time I will go over exposure related problems that can cause a hairy person to go bald, or as my fable goes, get eaten.