GROUNDWORK

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The Lighting Landscape...Is It Evolving?

It has been a little more than a quarter of a century since the birth of the low voltage landscape lighting system. It was this innovation that created the spark that grew into a multi million-dollar industry. However, considering the advancements in other technical industries, it would appear that landscape lighting has been relatively stagnant.

Over the last few years, I have had the pleasure of meeting face to face some of the cumbersome and costly ancient ancestors of the modern fixture. These unsightly carcasses are often found littering the landscape, tree branches buckling under the weight of one of these dinosaurs clinging desperately to a limb. It is sights such as these, that thankfully remind me that we have reached the 21st Century and I will never ever have to up a tree with a fifty pound fixture.

The MR16 was invented back in 1975, but it didn't make its impact in the landscape lighting market until much later. It is the MR16 that has remained a constant backbone of the lighting industry, and it is the MR16 that has greatly reduced the size and style of the common fixture. With more efficient heat sinks, more powerful and versatile bulbs have been utilized. The MR16 bulb is now available with dozens of varieties of reflective coatings allowing for a multiplicity of

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Photos courtesy of Color Kinetics

color temperatures and effects. The INFRA RED MR16 bulb has been fine tuned over the last decade. This fixture, using "Thermal recovery," reflects heat back across the filament, creating more lumen output with less energy consumption. This further reduces the cost of the low voltage by lowering wattage, and reducing the wire gauge and the transformer capacity.

Nearly everybody is familiar with the MR16. It has become the dominant species and is still evolving. The question remains: what is the next evolutionary leap in landscape lighting? The MR8 recently came out of the factories and is attempting to make a stand against its larger brother. At this time, however, its size is the one advantage over the MR16. It has only a half of the life expectancy of the MR16 and it cannot output the same levels of lumens. Eventually, we will see it catching up, and its greatly reduced size will make for miniature fixtures and greater flexibility in the landscape.

Even though the MR fixture reigns supreme, other technologies are positioning themselves as contenders for the crown. Possibly the greatest potential for taking the evolutionary leap are the "cold light" sources. The two most promising cold light sources are the RSL (Remote Source Light) and the LED (Light Emitting Diode). Cold light technology allows for more light in the visible spectrum, which means there is less heat radiation and therefore less energy loss. These technologies have been around as long as low voltage lighting, but have only recently become viable options for landscape lighting.

The LED is a diode chip (approximately 0.25mm square) mounted by steel wire in a minute reflector, current passing through the materials, illuminating the solid crystal chip. Adjusting the size of the chip and the shape of the reflector can alter the wavelength and color of light. In the past, the one color that could not be attained was white. Obviously this was a critical drawback and has only recently been overcome. Although the LED is incredibly energy efficient it is still unable to output enough lumens per watt to be of practical use in the landscape. Producing larger semiconductors, passing larger currents and improving light conversion efficiency have greatly increased lumen output, but it is still woefully weak. The LED does, however, have a life expectancy of approximately 100,000 hours, which has given it some serious headway in certain applications. The LED has proved useful in path lighting, step lighting and even underwater lighting. Companies such as Erco have created award winning LED step lights. Color Kinetics has designed some breathtaking fixtures using microprocessors to control clusters of LED lights, creating a myriad of color possibilities. It is not difficult to see the potential in the LED, and when it can reach an output of 100 lumens per watt, it will dominate all lighting markets.

The RSL is also being used in the landscape lighting industry, but only in limited applications. There are two types of RSL lights, the prism and the fiber optic. The fiber optic light consists of two or three components. First is the light source or the "illuminator". The illuminator contains a single lamp, reflector and optionally a remote controlled color wheel. The second is the tube or fiber, which can emit light along its length or at its end. The most important attribute of the fiber is it has an indefinite life expectancy. The third component is most critical to its future use in the landscape and architectural lighting, and that is the fixture. The fixture is added to the end of an end-emitting tube or fiber. The fixture regulates and focuses the light for various applications. Unfortunately, there are not a great number of fixtures on the market, which is limiting its versatility for the landscape lighting designer. The side emitting tubes have a look of neon and have been used to great effect in pool, pond and spa lighting, and remain the primary use of RSL lighting in the landscape. The RSL system has the ability to illuminate multiple locations from one satellite light source. This means that no matter where the light locations are you will only ever have to change one bulb at the source. You will never have to go up a tree to replace a down light bulb again! With more competitive pricing and the introduction of more fixtures into the market, the RSL systems could prove to be a good energy efficient, extremely low maintenance alternative to the 'old fashioned' low voltage system.

With all the new technological breakthrough's, landscape lighting has long since evolved into an art form where almost anything is possible.

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