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Electroluminescent wire, also referred to as EL, is used for a variety of purposes. Structure delineation and decoration; safety signage; vehicle decoration; artworks; nightclub decoration; and toy manufacture. As its name suggests it is simple electrical wire (copper wiring), which glows when a current runs through it.

The copper in electroluminescent wire is coated in phosphorous, which glows when the alternating current runs through it. The effect is similar to the effect seen out in deep ocean “phosphorescence” and can be achieved in varying degrees of brightness. The basic difference between EL wiring and other forms of flexible lighted material (like the rope lights you see in commercial seasonal decorations, for example) is the distribution of light: normal rope or wire style lighting is composed either of a series of lighted points, or is generated fibre optically from a single light source, while electroluminescent wire is lit all along its length and all around its circumference.

The flexible nature of EL wiring (it is after all just copper wire with a treated coating added to it) makes it perfect for decorative, creative and artistic applications. EL wiring has been used in the manufacture of clothing and footwear and can also be seen on vehicle detailing (normally modern detailing or the kind done to show class hot rods).

There are five component parts required to construct electroluminescent wire. At its core is a copper wire, coated with phosphorous. Then a fine wire is wound in a spiral configuration around the phosphorous coated core of copper wire. Importantly, there is electrical isolation between the copper core wire and the spiral wound fine wire that hugs the phosphorous coating.

A clear sleeve (made of protective material) is sheathed over the two wires and the phosphorous coat. At this point the electroluminescent wire will glow blue or green when an alternating current is passed through it. The final component of the EL wiring is a coloured sleeve, which is sheathed over the protective sleeve to give the wire the colour of its luminescence.

The light emitting effect (phosphorescence) achieved in EL wiring happens when an alternating current is sent between the copper wire core and the fine wire wound around the phosphorous coating. The fine wire acts as a capacitor (coaxial). The faster the charging and discharging of the capacitor, the more excited the phosphorous coating becomes and so the brighter the glow it emits. Controlling the speed and power of the charging and discharging of the coaxial capacitor in electroluminescent wire is what causes normal or super bright illumination to come from the finished product.

The final colours emitted by electroluminescent wire are determined by the dye placed in the last sleeve. Because phosphorous glows blue or green, the dyes used have to be colour matched to make reds, oranges, purples and yellows.

Efficiency is extremely good “you can run quite a lot of EL wire on AA batteries for hours.

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