ELECTROSPELL

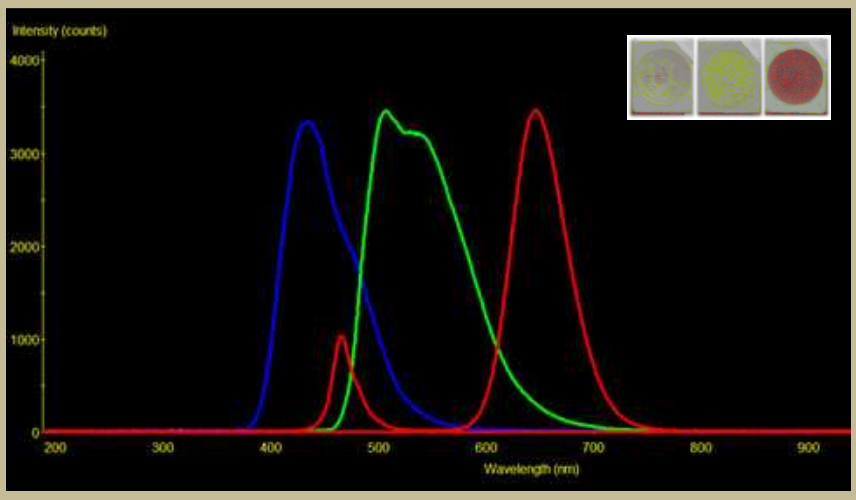
SPECTRAFILL

Now an unmatched colour viewing experience

Electrospell Spectrafill LEDs ~ A complete palette of vibrant colours for all kinds of high definition colour rendering.

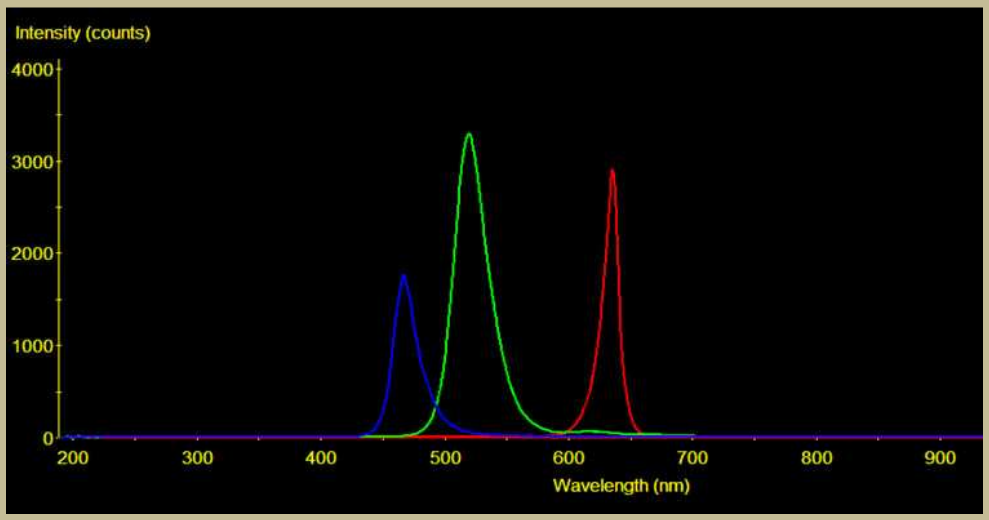
Finally, solid-state lighting can reach its full potential by providing accurate control over the colour of light. Though incandescent and fluorescent lights can be controlled in brightness, the light from LEDs offers the additional capability of tuning through all visible colours – setting it visibly apart. Using sets of red, green and blue (RGB) LEDs where each colour's intensity is separately controlled, it is possible to produce a wide gamut of colours. With ordinary LEDs this ability is limited by their narrow spectra but Spectrafill LEDs have been especially designed to synthesise millions of correct colour shades, easily and economically. Either analogue (current) signals or digital (PWM) signals can be used to control the spectral distribution of light from a Spectrafill RGB lamp. Electrospell can help in developing a complete lighting solution by providing reference designs and RGB LED modules. 8 bit digital control allows the generation of more than 16 million colour shades whereas 10 bit control provides more than a billion shades. Very attractive full-colour lighting systems can be constructed with Spectrafill red, green and blue LEDs for everything from outdoor lighting and decorative illumination to luminaries for photography, retail and museum lighting applications.

The light from Spectrafill LEDs appears visibly different when compared with light from ordinary LEDs. This is because of their broadband spectral character. Spectrafill red LED emits in the red region with the emission tailing off in the infrared and the orange regions. Spectrafill green LED emits broadly in the green and yellow regions of the visible spectrum. Spectrafill blue LED emits principally in the violet region with the emission trailing off in the ultraviolet and blue regions. Taken together, their combined spectra provide much better spectral accommodation than that from ordinary red, green and blue LEDs. The actual emission spectrum from the three Spectrafill LEDs is shown below.



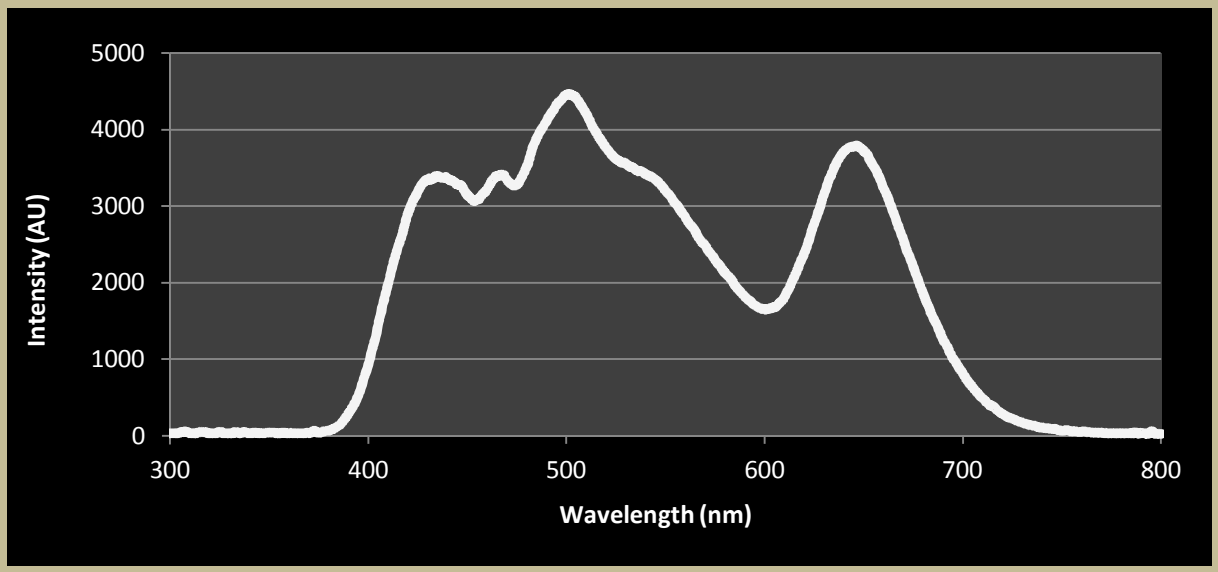
The entire 400 nm to 700 nm visible region is covered by the three LEDs (the small peak in red colour is a weak secondary emission from Spectrafill red LEDs). White light synthesised by combining the light from three separate Spectrafill devices has a significantly flat spectral distribution – ideal for

colour illumination. In contrast, light from ordinary red, green and blue LEDs is characterised by many missing and weak wavelength components, as seen from the spectra of such LEDs that is shown below.



Thanks to the nearly flat white spectrum that results from mixing light from Spectrafill RGB LEDs, the lighting quality is much improved from what can be obtained with single white LEDs. This is, therefore, a much superior way of creating high-quality white light. Fixed drive systems can be implemented with Spectrafill LEDs to generate light with a fixed spectral distribution. With a little more sophistication, full spectral variability can also be implemented.

Spectrafill RGB white light systems offer both very high quality white light illumination and the flexibility of changing the shade of white light to different effective colour temperatures. Instead of just ‘cold’ white light and ‘warm’ white light, a much bigger shade space is available. Lighting designers can use this capability to make everything from mood lights to object-specific luminaries. A typical broad spectrum white light obtainable from Spectrafill RGB LEDs has the spectral distribution shown below. The shape and width of the distribution enables the development of very high Colour Rendering Index (CRI) light sources. Three band, 8 or 16 bit control further allows this distribution to be manipulated as desired to create millions of variations.



Spectrafill LEDs are available in both conventional 5 mm diameter (T-1 3/4) epoxy packages and in PLCC SMD packages. The LEDs can be easily assembled into full-colour RGB modules that can be driven by either analogue or digital drive signals. Further details on all Spectrafill LEDs as well as application support can be obtained from Electrospell.

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