

TCI's photo voltaic technology worked in the development of OLED.

TCI's photo voltaic technology is used in our OLED production process. We combined production technologies available in TCI, and developed the OLED production technology.



How OLED Works

As for the simple workings of OLED, the organic luminous layer, the organic layer which transports electrons, and the organic matter which transports positive holes are layered between the positive pole and negative pole, and then by inserting the + (positive hole) and - (electron) from each electrode and energizing the luminous layer, the luminous layer glows. Also, one of the electrodes is made from transparent material in order to extract light from the luminous layer. The organic layer layered between the electrodes is thin, and using a very small amount of doping materials allows it to illuminate with only several volts of electricity.

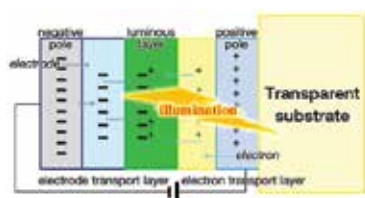


Figure 1

Mixing various luminous dopants into the luminous layer makes it possible to change the color of the illumination. By combining the basic colors - red, green, and blue (known as the "three primary colors of light") - and changing the ratio of each, a variety of different colors can be produced. By overlapping all three primary colors - red, green, and blue - on top of each other, white light is produced.



Figure 2

Features of OLED

An ideal light source for illumination is one that produces the same quality of light as the sun. Therefore it is necessary for a light to have a broad configuration of mostly equal intensities of light spanning the entire visible-light spectrum. Such a broad spectrum is a feature of OLED production. The figure 3 shows a white-light emission spectrum mixed from certain percentages of red, green, and blue light.

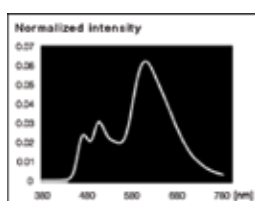


Figure 3

Spectrum

When natural light passes through a prism, colored lights are separated out from a light possessing a short wavelength just like a rainbow. The resulting colors are called a spectrum of light. The brightness felt by your eyes also varies depending on the wavelength of a light, even if the energy possessed is the same (Figure 4).

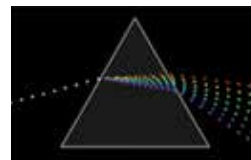


Figure 4

Color Temperature

Color temperature refers to a fixed value on a linear scale (unit), expressed numerically, of light being produced by a given light source.