



## Technology

LED is an acronym for light-emitting diode. This type of lighting is most commonly used to illuminate signs, signals and displays but is rapidly evolving to provide light for general illumination. According to industry leaders, solid-state lighting such as LED has the potential to revolutionize the lighting industry and is heralded as the future of lighting thanks to its energy efficiency and low maintenance requirements.

At enLux, our scientists and engineers used discovery, application and the most advanced technology to create the first ever LED drop-in replacement for conventional floodlights. enLux revolutionary LED products are built on the following four basic technologies:

### Compound Semiconductor

Light Emitting Diode (LED) utilizes compound semiconductor materials, primarily the AlGaInP compound which is able to emit light ranging from Red to Amber wavelength, and the GaInN compound that emits light ranging from Green to Blue wavelength. Both these compounds are created using compound semiconductor materials. LED is generally fabricated from an epitaxy process using MOCVD (Metal Organic Chemical Vapor Deposition) putting p, i, and n layers onto a wafer. After the dicing and binning processes, most companies pack a single LED chip, ranging from 7mils to 40mils square, into a single lamp. enLux, on the other hand, packs multiple LED chips into a light engine. This means the enLux light engine has greater and more intense light output for practical light applications.

### Advanced Packaging

Most LED lamps contain a single LED chip. enLux uses advanced technology to pack 50 to 100 LED power chips (power chip means >20 mil square) to a small substrate using COB (Chip-on-Board) technology. enLux's patented COB technology meets the optical, electrical, mechanical and thermal requirements necessary to properly operate a high power LED device. The enLux 22 watt light engine, a drop-in replacement floodlight, is the first in the world to enter mass production using COB technology. Since it's a drop-in replacement, there are no separate wires or power supplies necessary, just unscrew the old incandescent bulb and screw in the enLux light.

### Thermal Management

Although LED converts electricity to light very efficiently, excess electrical energy that does not become light is converted to heat. An LED chip is a semiconductor, and most semiconductors must operate at a low junction temperature because as the junction temperature increases, the LED lifespan decreases exponentially. In order for an LED product to meet its lifespan claims of 50K to 100K hours, proper thermal management must be implemented at the chip level, light engine level and product level. enLux lighting products apply effective thermal management on every level to ensure the longest possible life.

### Direct Energy Conversion.

Direct energy conversion is solid-state, involving no moving parts – which means it is quiet, clear, compact, and sustainable. Photovoltaic or solar cell converts sunlight directly into electricity; thermoelectric generator converts heat directly into electricity; LED converts electricity directly into light. Each of these examples of direct energy conversion uses the particular property of a specific type of semiconductor or compound semiconductor. enLux scientists and engineers have a unique understanding of direct energy conversion, making enLux your best choice for solid-state lighting.