LumiLor Basics and FAQ

What is LumiLor?

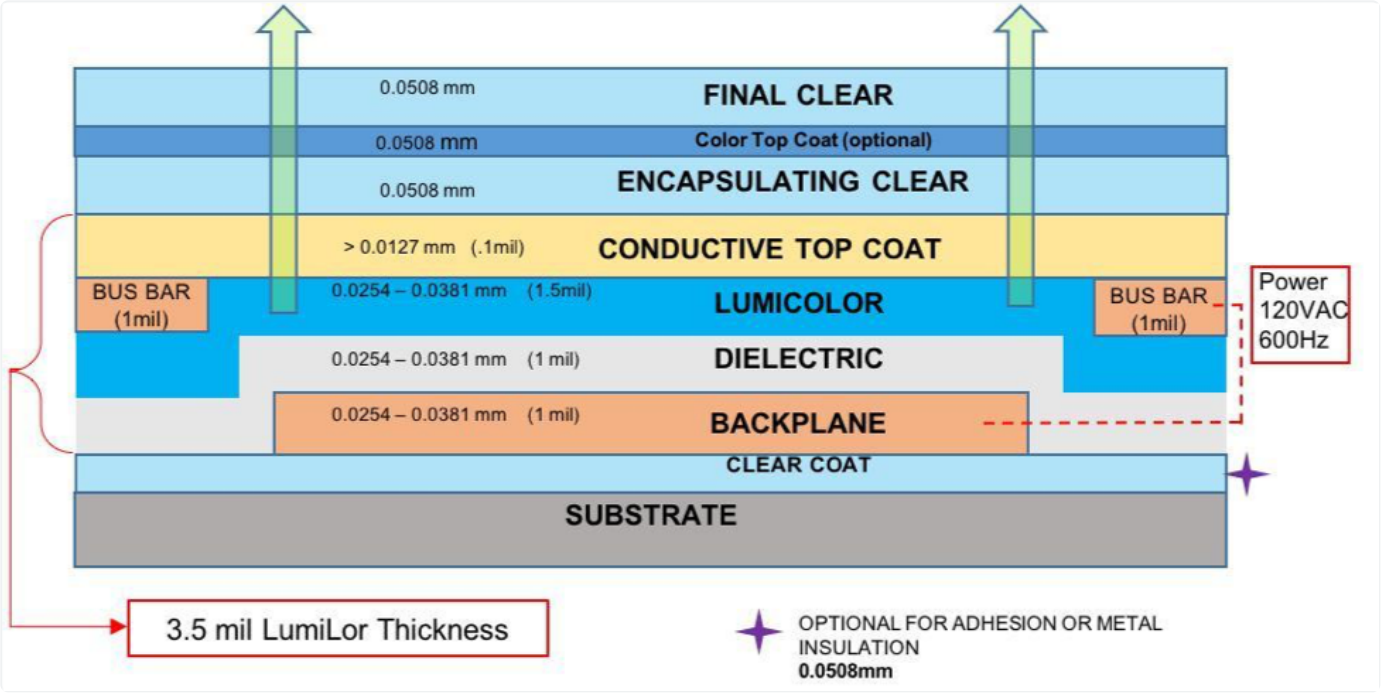
LumiLor is a patented Light Emitting Coating (LEC) system which allows anything coated with it to illuminate. LumiLor works with electroluminescence (EL), an optical and electrical phenomenon in which a material emits light in response to an electric current.

Watch this overview of how LumiLor works.

LumiLor Terminology

LumiLor is a multi-layer, sprayable, electroluminescent coating system consisting of backplane, dielectric, LumiColor, busbar, and Conductive Top Coat.

Collectively the entire application is known as the LumiLor Stack.



Backplane - Highly conductive low resistance material that allows the electrical current to be supported across the entire illuminated surface.

Dielectric - Insulation layer when applied over the backplane and under the busbar to insure there is no burning or shorting of the system.

LumiColor - Large particle material which emits light when under power.

Busbar - Backplane material that provides a low resistance path for better distribution of electrical current.

Conductive Top Coat - Translucent conductive material sprayed over the entire surface which allows the electrical current to be distributed to produce light.

Encapsulating Clear or Encapsulating Top Coat- Automotive grade speed clear coat to protect LumiLor from elements, contamination, and ultra-violet (UV) rays. It also encapsulates the electrical current within the LumiLor system to protect from electrical shock and provides a surface for optional top coating.

Properties of LumiLor

LumiLor is:

- Cool to the touch even when emitting light
- Thin. It has a thickness of approximately 4.6 mils when applied according to specifications
- Is flexible up to nearly 180 degrees

- Reliable with no filament to break
- Highly visible at great distances and in darkness, smoke, fog etc.
- Easy to look at, pleasing to the eye
- Low on energy consumption

What Color is LumiLor when Lit and Unlit?

LumiLor is available in eight colors, these are colors you see when LumiLor is lit.

- Green
- Aqua
- Blue
- White
- Yellow
- Pink
- Violet
- Orange

Unlit LumiLor appears as a gray hue, similar to an automotive primer.

Red tones can be achieved by top coating LumiLor with tinted clear coats or colored top coats such as candies and pearls, or even with hydrographics. This is typically applied over white LumiLor to provide the most true color effect. Always test top coats on a sample to see how they will look.

Top Coats, Opacity, Transparency, and Light.

LumiLor emits light and anything placed over LumiLor will absorb a certain amount of light.

Think in terms of opaque (blocks light) and transparent (light passes through).

Opaque top coats are used to hide the light you want to block.

Transparent paints, such as pearls and candies, can be used to tint the color.

The heavier a transparent top coat is applied the more light it will block.

Experiment with how your top coat appears with LumiLor in both the 'on' and 'off' states.

Artwork can be applied over LumiLor including hydrodipping, spray chrome, airbrush, etc.

What Determines the Color of LumiLor?

The zinc sulfide, ZnS, phosphor crystals used in LumiLor get their emission colors by being altered (also known as 'doped') with metals. For example, green LumiColor is doped with copper. The dopant metal in the phosphor crystals serves to focus the electrostatic field enabling spontaneous emission to occur. Because the photon emission color for copper is green, the light emitted is green.

What Can LumiLor Be Applied To?

LumiLor can be applied to any non-porous substrate including but not limited to

- Metal, wood, fiberglass, carbon fiber, plastic, vinyl

Adhesion promoters can be used on a substrate but must have automotive clear applied over it before the LumiLor application begins.

- Glass, rubber, HDPE plastics

Click here for specific instructions on substrate preparation.

How Long Will LumiLor Last?

The lifespan of LumiLor is dependent on how much power is applied and the native LumiLor color used. More power equals brighter light but a shorter half life.
'Half life' is not an indication of total useful life. LumiLor will degrade in brightness up to the half life, and then plateau. There are documented applications of electroluminescence using materials identical to the main components of LumiLor where the useful life of the product has been measured over 10,000 hours, and in some up to 50,000 hours.

Charging and discharging LumiLor does not affect the half-life. LumiLor only degrades towards its half life when it is charged.

What is the Shelf Life and How Should LumiLor be Stored?

- Shelf life is 6 months from date on the bottle or can
- Ideal storage is in ambient temperatures between 70 and 75 degrees Fahrenheit
- Do not allow LumiLor to freeze
- Do not store bottles and cans upside down
- Do not store in direct sunlight or under ultraviolet light

Basic Electronics Knowledge

Basic Electronics Knowledge can be found here.

What is the best way to design my LumiLor layout?

There are two main approaches depending on what you are trying to accomplish.

You can apply LumiLor to a generic area - a circle, square, or whatever shape you want. After that you can block the areas you don't want to illuminate with an opaque paint, vinyl, or other coating.

The other option is to create a stencil and apply the LumiLor Stack only to the area to be illuminated.

You can 'paint a wire' from your LumiLor field to the edge of the substrate and even wrap it around to the backside to avoid drilling a hole in your substrate. Learn more about how to paint a wire here.

Can LumiLor be damaged with a dent, ding, or scratch?

Possibly. It depends on where the damage occurs. If the power path is damaged the power would be cut off and LumiLor will not illuminate. It is possible to fix damage like this.

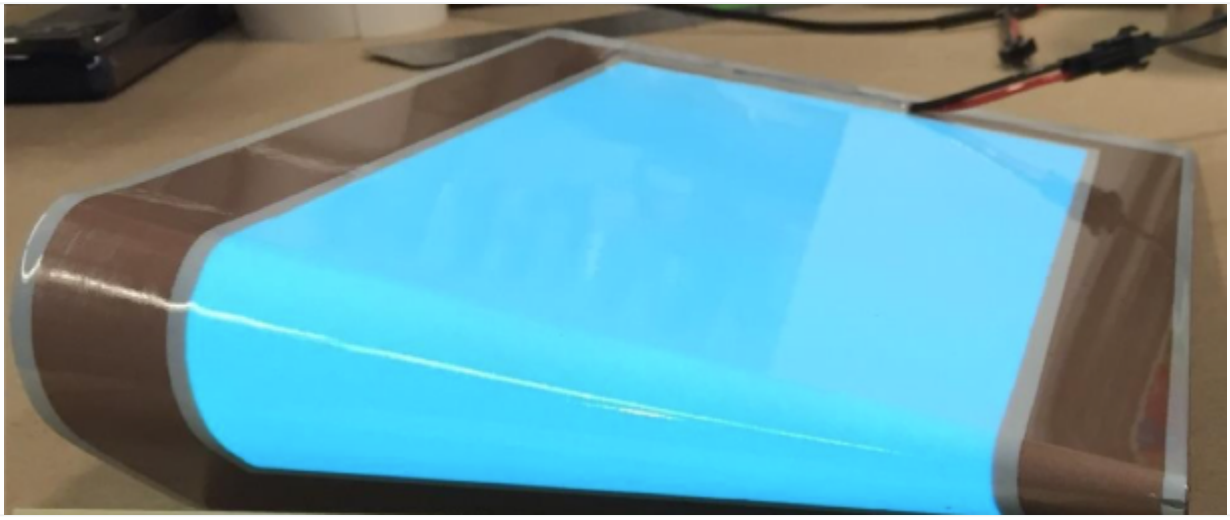
If the damage is inside the lit area you will see a dark spot where the damage took place. This type of damage cannot be repaired and should be encapsulated with clear coat to protect it.

What are the safe operating temperatures once LumiLor is applied?

LumiLor operates safely between -40℉ and 180℉ or -40℃ to 82℃.

What is the flexibility of LumiLor once applied?

LumiLor can be rolled back 180 degrees. Folding will cause cracking in the materials.



How will LumiLor react to car waxing and buffing?

LumiLor is covered with an automotive grade clear coat, so any waxes, polishes, etc. will be on the clear coat, not directly on LumiLor so there is no direct impact.

Is LumiLor RoHS compliant?

Yes. All layers of LumiLor have passed RoHS testing.
RoHS - Restriction of Hazardous Substances Directive

Tests	Results/Unit	Method
Br, Cd, Cr, Hg, Pb	Passed	XRF Screening

Electroluminescence - History and Explanation

Electroluminescence (EL) is an electrical and optical phenomenon that was first observed in 1907 by Captain Henry Joseph Round, however the first published science paper was not written until 1936 by George Destriau. The next 75 years saw great improvements in the technology in terms of lifetime and brightness until it became a suitable light source for many applications. In 2009, Andy Zsinko invented the first sprayable EL technology, LumiLor.

Electroluminescence works by the stimulation of phosphor crystals in an electromagnetic field. The flow of alternating current from the negative to the positive terminal is interrupted by the insulating properties of the phosphor and dielectric layers.

Because the flow of the current is interrupted, the negatively charged electrons builds up a negative charge on one of the electrodes which in turn builds up a positive charge on the other electrode. This build-up of electrical charge creates a powerful electrostatic field between the two electrodes.

This electrostatic field acts upon the atoms in the phosphor crystals to stimulate light emission through the electroluminescent effect.

LumiLor Research and Development?

We have invested over $4,000,000 in testing and certifying LumiLor to assure that, when properly applied, your paint job remains bright, and does not crack, peel, or delaminate.

LumiLor is subjected to the harshest standards an automotive basecoat is asked to endure. We have demonstrated the ability to pass ASTM G154, where UV light and water vapor rapidly

weathers a panel. We have run this test for over 400 hours without incurring a loss in brightness, adhesion, or film quality.

We have also demonstrated LumiLor can pass ASTM D3359, where we test the adhesion of the film when the film is damaged through both an X test and a crosshatch. We actually go beyond the test method, and soak the panels in water for 24+ hours prior to applying the tape and testing the adhesion. In all circumstances, a properly applied LumiLor system can pass these enhanced tests without issue.

Note that we cannot certify LumiLor to these standards independently. Substrate, application, and top coat as a system must be tested in order to certify the coating for an application.