

About Electroluminescent Products

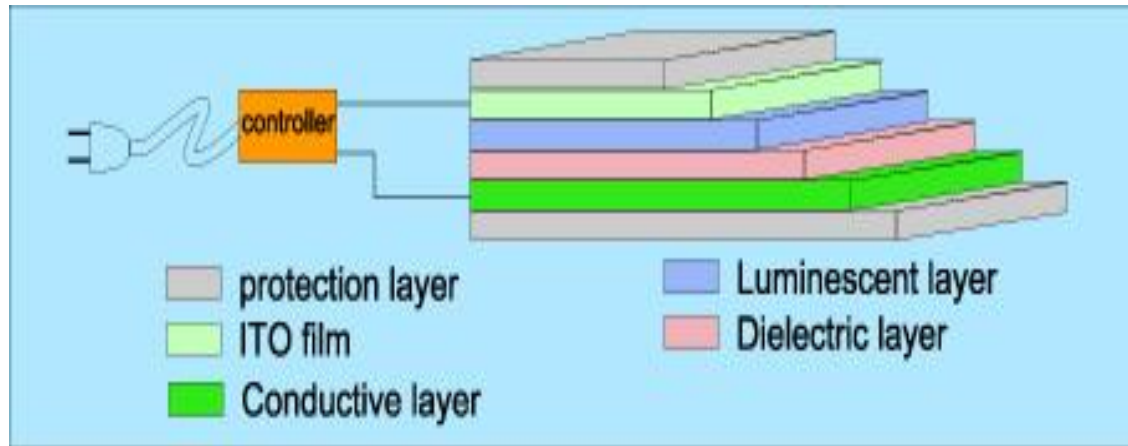


- Electroluminescent (EL) lights and lighting systems were originally developed for military uses and have been around since the 1930's
- In recent years, the technology for producing EL products has improved dramatically
- As a backlighting technology EL has been applied to hundreds of products including cell phones, wristwatches and PDAs
- The quality of EL has improved to the point where it is now viable as a creative solution for the advertising and marketing industries.

Where eye-catching animated effects, high-resolution graphics and accurate reproduction of colors and logos are essential elements for getting the attention of your audience. Being the bridge of science and art and commerce.

www.madisplays.com

The Principle of Electroluminescence



An EL lamp is essentially a capacitor structure with an inorganic phosphor (zinc sulfide compound) sandwiched between the electrodes.

Application of an AC voltage across the electrodes generates a changing electric field within the phosphor particles causing them to emit light. For most EL lamps, an inverter is used as a power source.

An inverter is a DC-AC converter, which typically generates 60-115V AC and frequencies in the region of 50-1000 Hz. For signage applications much higher frequencies can be used to increase lamp brightness.

EL Features and Benefits



- Illuminated and animated panels provide significantly better eye-catching capabilities than ordinary backlit signs and posters
- High-resolution graphics – works with photo-quality artwork
- Artwork is still functionally visible when sign is switched off
- Uniform illumination of complex shapes - provides consistent, high-quality animation effects

EL Features and Benefits



- At M.A.D, we provide our best to ensure on the best poster colour our animated poster would be used when illuminated and when the illumination is off so that the artwork is accurately represented in both modes
- Non-glare for easy viewing
- Wide visual angle (160 degrees) - signage is effective from a broad field of directions



EL Features and Benefits

- High-brightness available – provides appropriate level of illumination and superior visibility in bright artificial light, dim light or even foggy conditions
- Super thin and flexible - it conforms to most surfaces and can be bent around curves (5mm radius) and still deliver high-quality light & animation effects

EL Features and Benefits



- Vibration and impact resistant – more reliable and less fragile than filament and glass-based lighting products
- Light weight – makes it easier to handle and display, costs less to freight and offers greater number of applications
- No light box or heavy infrastructure required – easy to install or replace, offers greater number of applications and reduced costs

EL Features and Benefits



- Long life (Over 10,000 hours) – Optimal operating hours is at 3000 – 5000hrs.
- No catastrophic failure, no filament to burnout - greater reliability.
- Cold light source, no detectable heat output during illumination – energy efficient, power not wasted as heat energy
- Low power consumption – low operating costs
- Does not produce ultra-violet radiation

Technical Data



- Power sources: DC1.5 to 24V and/or AC110/220V
- EL Supply voltage: AC 60 to 200 V
- Supply frequency: 50 to 1500 Hz
- Operating temperature: -20 to 50C
- Storage temperature: -30 to 60C
- Brightness: 30 to 150 cd/m²
- Current: 0.1-0.2 mA/cm²
- Power consumption: 10-20mW/cm²
- Light wave length: 450nm to 750 nm
- Life time: 5000 - 10000 hours

Competitive Technologies



Incandescent Lamps

- Relatively high power draw
- Prone to catastrophic failure due to vibration
- Low cost, but require light-pipe for uniformity
- Expensive infrastructure and fixtures are required to provide animation effects
- Bulky
- Generate heat

EL Lamps

- Low power draw
- Hi resistance to vibration
- Inherently uniform lighting pattern across the entire EL panel
- Integrated animation effects require no additional fixtures and infrastructure
- Thin and lightweight
- Run cool, generating no heat

Competitive Technologies



Light Emitting Diodes (LED)

- Low cost, but require light pipe for uniformity
- Long life, solid state
- Limited colors - no white
- Relatively high power draw

EL Lamps

- Inherently uniform lighting pattern
- Long life, solid state
- Bright white light available, consistent, true colour illumination of high resolution graphics
- Low power draw

Competitive Technologies

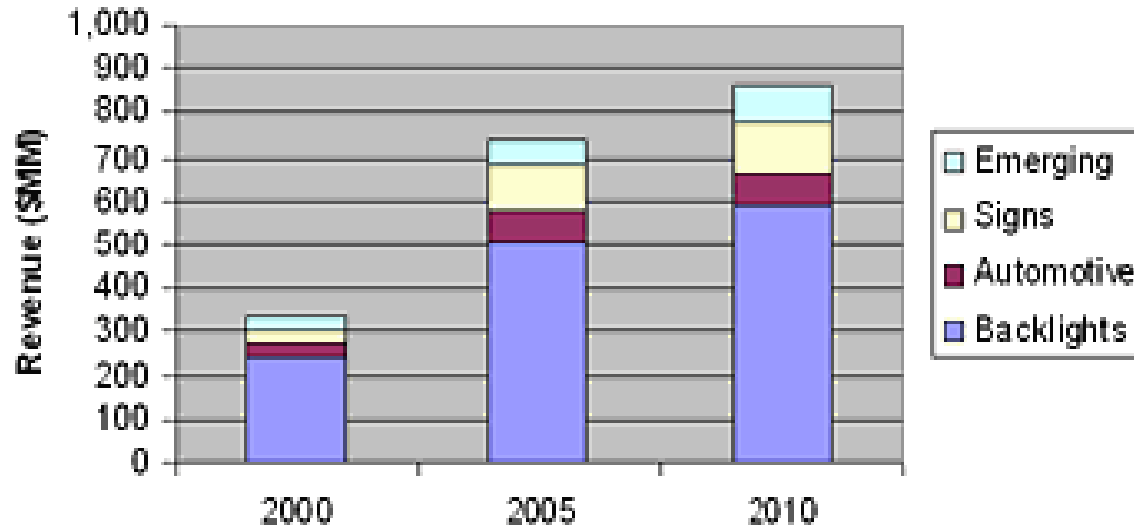
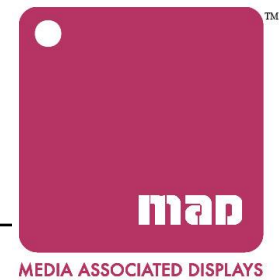
Neon Lights

- Provide animation effects, but do not work with high-resolution graphics
- Require high voltage
- Fragile glass
- Difficult to ship
- Can't be used near food service
- Expensive to repair or replace

EL Lamps

- True-colour reproduction and animation of high-resolution graphics
- Do not require high voltage
- Vibration and impact-resistant
- Light weight and durable - easy to ship
- Cost-effective to own and operate

EL Lamp Market



EL Applications



- Applications for EL lamps are virtually unlimited.
- EL lamps have been applied to hundreds of products, including advertising signage, POP displays, safety signals and signs, pet collars, cell phones, PDAs and illuminated devices of all kinds, sporting equipment, courtesy, decorative and functional lighting for the automotive, marine and aviation industries, to name but a few current applications

EL Applications



LCD Backlights

- Since EL lamps provide even brightness, low power consumption and are super-thin, EL lighting is the most appropriate light source for LCD backlights.
- Our EL products have been used in instrument panels, audio equipments, beepers, mobile phone, notebook computers, telephone, calculators and more.

EL Applications



Advertising Signage

- The brightness, true-colour representation and eye-catching animation make M.A.D poster (EL) technology ideal for all sorts of applications in advertisements, banners and other signage where corporate logos or trademarks are displayed.
- Because M.A.D (EL) lamps are durable and flexible, they can be bent and curved and cut to different shapes in the manufacturing process.
- M.A.D (EL) lamps work well under a broad variety of conditions.

EL Applications



Emergency, Informational and Directional Signage

As an emergency sign, the soft M.A.D (EL) lamps green lighting consumes low power and offers high-grade and steady illumination with excellent visibility through smoke, fog and rain.

EL Lamps provide high visibility through smoke, fog and rain. EL is suitable for safety signs, lighted safety apparel, docks, safety belts etc. Other applications include traffic signs, doorplate numbers and automobile license plate numbers.

EL Applications



Toys, Seasonal Decorations, Electronic Promotional Gifts and Novelties

- Our animated M.A.D (EL) Lamps has been used in many custom applications such as flashing badges, hats and clothing and photo frames.
- We work closely with our clients to understand their requirements and provide them with unique, customize solutions

EL Applications



M.A.D Animated (EL) Displays

- Thanks to unique characteristics such as low power consumption, uniform lighting surface and super thinness, electro-luminescent panels are the most suitable for various kinds of displays where data and information must be easily illustrated with clear readability