

Light Bulb Replacement

Introducing: Electron Stimulated Luminescence™ Lighting Technology

Another contender has stepped into the ring of energy efficient lighting: called ESL (electron-stimulated luminescence), this new type of bulb works by using accelerated electrons to light up a phosphor coating on the inside of a glass bulb. ESLs can turn on instantly, can work with dimmers, and creates a light quality that's similar to incandescents and halogens.

Vu1, the company behind the technology, says ESL bulbs don't contain the trace amounts of mercury in CFLs and don't require the manufacturing energy behind LEDs, making it better than both. The first screw in models, which produce 40 lumens per watt with a 6,000 hour lifetime, are expected to be available by September 2008. At \$12 a bulb, they cost about the same as dimmable CFLs already on the market. [[Vu1](#) via [Cleantechnica](#)]

Electron Stimulated Luminescence (**ESL™**) Lighting Technology is an entirely new, energy efficient lighting technology. It is neither incandescent, fluorescent nor LED.

To contrast:

Incandescent bulbs heat a filament to generate light.

Compact Fluorescent Lights (CFL) send a current through a mercury vapor that emits UV light to excite a phosphor.

Light Emitting Diodes (LED) create light by electrically stimulating a semiconductor material

ESL Lighting Technology uses accelerated electrons to stimulate phosphor to create light, making the surface of the bulb “glow”. ESL Technology creates the same light quality as an incandescent but is more energy conserving. There is no use of the neurotoxin Mercury (Hg) in the lighting process.

Tested, Proven & Safe

In creating ESL Technology, Vu1 merged several existing and proven technologies then uniquely adapted them for “lighting”. Vu1 uses

commonly sourced, non-hazardous, commercial materials that are customized to our specifications. Our ESL Technology is encased in standard light bulb glass which is sourced from existing light bulb glass manufacturers. No specialized glass is required. We are currently developing a highly energy efficient, perfect light quality, mercury-free light bulb.

Safe as a lighting source, the ESL Technology fits neatly into classic light bulb shapes familiar to consumers everywhere. This eliminates the need to bend the technology into an unusual, twisted spiral shape (CFL) or have costly and heavy heat dissipation designed into the bulb housing (LED).

Key gate-keeping elements of the technology and associated manufacturing processes are patent pending.

Light Bulb Technology Comparison

FEATURES & CAPABILITIES	Incandescent	CFL	LED	Halogen	Vu1 ESL™
Energy Efficient		◆	◆		◆
Perfect Light Quality	◆			◆	◆
Instant On	◆		◆	◆	◆
Dimmable	◆			◆	◆
Mercury Free	◆		◆	◆	◆
Works with Timers & Photo Controls	◆		◆	◆	◆
Affordable	\$	\$\$	\$\$\$ \$\$	\$\$	\$\$
Safely Recyclable	◆			◆	◆
Not Susceptible to Heat	◆			◆	◆
Long Life		◆	◆		◆

The arrival of Vu1's ESL Technology adds an important new path for residential lighting options.

For energy efficiency, Vu1 is targeting to be equal or better than the CFL.

However, unlike either the CFL or the LED, Vu1 carries forward desirable incandescent lighting features loved by consumers today:

- perfect light quality
- instant-on
- ability to fully dim

In a world where consumers and governments are growing increasingly sensitive to Climate Change impacts, the carbon footprint size of a product throughout its lifecycle really matters. ESL Technology has a favorably small footprint beside the huge

manufacturing and disposal costs footprints being generated by LED and CFL light bulb technology.

The ENERGY STAR CFL Choose A Light Guide

ENERGY STAR (ES) qualified lighting provides bright, warm light but uses **about 75% less energy** than standard lighting, produce **75 percent less heat**, and **lasts up to 10 times longer**.

Usage Tips:

To have the best experience possible, keep the following tips in mind: Hold the base and not the glass to screw in the bulb. Read the packaging to see where each bulb should be used. Not all ES qualified CFLs are designed to work in every socket. Use ENERGY STAR qualified light bulbs in places where you will have the light on for at least 15 minutes at a time. Frequently turning a CFL on and off will shorten the bulb's lifetime. **Most photocells and timers are not designed to work with CFLs.** Check with your photocell or timer manufacturer for compatibility.

When your CFL burns out, recycle it. Go to www.epa.gov/bulbrecycling for recycling locations. If a bulb breaks follow the guidance found at www.energystar.gov/CFLsandMercury (60KB). Every time you are using an ENERGY STAR qualified product you are saving energy, money, and greenhouse gas emissions.

Light Temperature Tips - Choose Your Mood: While most CFLs come in "warm" colors to match the yellowish light of incandescent bulbs, you can also choose "cooler" colors with whiter and bluish hues for reading and task lighting. Color in lighting is measured on the Kelvin scale (K) and is marked

on CFL packaging. For warmer color look for 2700–3000K, 3500–4100K gives a bright white light and 5000–6500K is bluer and most like daylight.

Bulb-Specific Tips - How to Choose Spiral Bulbs: If these spiral-shaped light bulbs look familiar it's because they're the most popular type of Compact Fluorescent Lamp (CFL). Spiral CFLs create the same amount of light as traditional incandescent bulbs, but use less energy. Many traditional bulbs around your home (from 60w to 150w) can be replaced with spirals. There are spirals for dimmers and three-way switches (just check the packaging). Spirals also come in a variety of colors like soft white, natural light, or daylight.

Covered A-Shaped: A-shaped bulbs combine the efficiency of the spiral bulbs, with the look and feel of the traditional incandescents. These products are great for consumers who don't like the look of the spiral bulbs but still want efficient lighting. You can use A-Line bulbs wherever you used to use traditional incandescents. Check the packaging for compatibility with dimmers and three-way fixtures.

Covered Globe: Globe-shaped bulbs are ideal for use where you can see the bulbs, like bathroom vanity bars and ceiling pendants. A globe bulb is basically a spiral bulb with a decorative cover. Like other covered CFLs, globe bulbs need a little time to "warm up" and reach full brightness. But be patient — ES qualified light bulbs generate just as much light as traditional bulbs, while using less energy.

Tubed Bulbs: Some of the first ES qualified light bulbs were tube shaped. Basically straight versions of the spiral bulbs, tubed bulbs work well in lamps that have slender covers such as wall sconces.

Candle Bulbs: These products are ideal for use in decorative fixtures where you can see the light bulb. The sleek shape also allows you to use them in tight fitting light fixtures where a covered globe won't fit.

Indoor Reflector Bulbs: Reflector bulbs are perfect for providing directional light — think of recessed ceiling lights in kitchens or ceiling fans. Indoor reflector bulbs are much smaller than those that are designed for outdoor use. Some indoor reflector bulbs can be used with a dimmer — the packaging will tell you.

Outdoor Reflector Bulbs: For use outside, reflector bulbs are sealed to withstand the rain and snow. Because of this, they're usually much larger than the reflectors designed for use inside. Don't use the outdoor reflectors

with timers, photocells, and motion sensors because you could shorten the life of the bulbs.

3-Way CFLs: Fixtures or lamps with three-way switches require the use of a three-way CFL. Check the packaging to make sure that the bulb is intended for this use. Installing three-way CFLs may require extra effort since they can be slightly larger than their matching incandescents, but they still use one-third as much electricity. Three-way bulbs typically come in Soft White color temperature.

Dimmable CFLs: Fixtures or lamps with dimmer switches require the use of dimmable CFLs. Not all CFLs are dimmable so check the packaging to make sure it is. Dimmable CFLs work differently than incandescent bulbs. Incandescents dim smoothly from 100% of their light output to no output and their light color changes from a bright white

to a warmer yellow. Dimmable CFLs maintain light color more consistently and dim to 10%–40% of its original brightness. Dimmable bulbs typically come in Soft White color temperature.

Light Fixture-Specific Tips: Where to Use Ceiling Fixtures: For ceiling fixtures, spiral or tubed ENERGY STAR qualified bulbs are an economical choice. Ensure your fixture allows airflow to prevent excessive heat from shortening the life or decreasing the amount of light the CFL gives off. If your ceiling fixture is hooked up to a dimmer switch, make sure you only use dimmable bulbs or else the light bulbs won't dim and might even burn out sooner.

Pendant Fixtures: While bare bulbs can be used, most people prefer the look of covered ES qualified light bulbs in their pendant fixtures. Covered bulbs come in both traditional "A" or globe shapes. If your pendant fixture is hooked up to a dimmer switch, make sure you only use dimmable bulbs or else the light bulbs won't dim and might even burn out sooner.

Wall Sconces: Due to their smaller sizes, spiral or bullet ENERGY STAR qualified light bulbs will work well in wall sconces. If your sconce is hooked up to a dimmer switch, make sure you only use dimmable bulbs or else the light bulbs won't dim and might even burn out sooner.

Recessed Cans: Indoor reflector light bulbs work best in recessed cans because they are specially designed to direct the light out of the fixture and to withstand the heat buildup that occurs in these fixtures. If your recessed cans use a dimmer switch, make sure you buy reflectors that are able to dim. The packaging will tell you whether or not you can use them with a dimmer.

Outdoor Covered Fixtures: Spiral or tubed ENERGY STAR qualified light bulbs are both appropriate to use in outdoor covered fixtures where the weather can't harm them. If you live in a cold climate check the packaging for starting temperatures to make sure the bulb will work properly. Check with the manufacturer of electronic controls like photocells, timers and motion sensors for compatibility with CFLs.