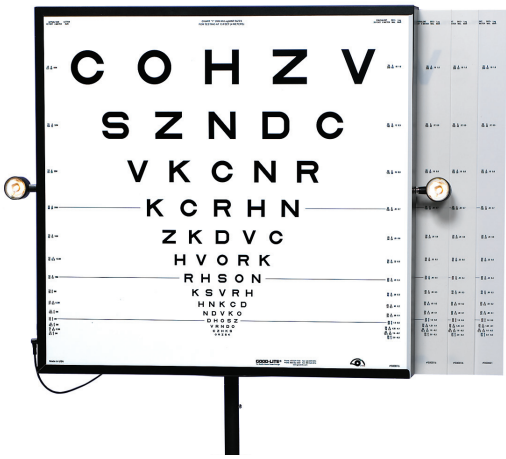


# Cost Comparison of ESV-3000 Versus Standard Back-Lit Fluorescent ETDRS Light Boxes

Cost for ESV3000 - $2200.00

Cost for Backlit Fluorescent Light Box - $1000.00

### ESV3000

The ESV3000 uses a low energy LED system to provide uniform standardized illumination. Simply turn the instrument on, and within seconds, the self-calibrating circuitry automatically measures the light output and adjusts the light level to 85 cd/m$^2$, the standardized testing light level recommended for FDA clinical trials.

Backlit fluorescent light boxes have no standardization circuitry, and even if they did, off-the-shelf fluorescent bulbs cannot be standardized using feedback circuitry. To circumvent this problem, a 96 hour burn-in period is used to stabilize the light output of bulbs. Many sponsors require centers to maintain at least two sets of “burned-in” bulbs in order to maintain certification as a testing center.

### Bulb Burn-In Process Costs Time and Money

In order to create an inventory of burned-in bulbs, clinical staff members must perform a number of time consuming steps. It is estimated this burn-in process requires at least 2 hours of staff time to accomplish all of the steps for each set of burned-in bulbs; order the bulbs, remove bulbs from the light box and insert the new to-be-burned-in bulbs on Friday afternoon, reverse the process on Monday morning, repeat the same process for the next weekend, label the bulbs, store the bulbs and then annotate an inventory or clinical trials log book.

The fluorescent bulbs should be replaced after 2,000 hours to maintain a more consistent light level, which requires the creation of one to two sets of burned-in bulbs each year. At $100 per each hour of clinical staff time, the burn-in process cost per year is $200 to $400.

The bulbs also have a direct cost of $15 per bulb. The yearly cost of 1 to 2 sets of burned-in bulbs is $30 to $60.

Despite a proper burn in period, due to variances in bulb manufacturing and electrical output, there is no guarantee that the backlit fluorescent light boxes will provide the proper standardized illumination. Therefore, some cost is associated with monitoring the light levels of the light boxes and ensuring compliance. A minimum of one hour of clinical staff time is required per year for this monitoring process, costing an additional $100 per year.

The Table Below Shows the Cost Per Year to Maintain the Backlit Fluorescent Light Box.

| Cost per Year | |
|---|---|
| Burn in Process | $200 to $400 per year |
| Bulb Cost | $30 to $60 per year |
| Monitoring | $100 per year |
| **Total Cost** | **$330 to $560 per year** |

At this cost level, the price difference between the ESV3000 and fluorescent backlit light boxes is offset within 2 to 4 years, after which the ESV3000 is much cheaper to operate. The LEDs used in the ESV3000 have an expected life span of 50,000 hours, which translates into 24 years of use.

### Other Cost Saving Factors

LED lighting systems require only 1/10th the energy of fluorescent bulbs. Indeed, the 96 hour burn-in period alone (which includes no testing time) uses approximately one-half the energy required to power the ESV3000 for half a year (1,000 hours) for clinical trials testing. Also, LEDs are RoHS compliant, containing no mercury or lead and requiring no special disposal requirements, as do the fluorescent bulbs.

The ESV3000 has a smaller footprint, with a width that is 4" more narrow than the backlit fluorescent light boxes. This additional 4 inches can help to accommodate the 4 meter test distance that sometimes can be difficult to obtain in certain examination lanes.

Standardization of the lighting occurs automatically, eliminating the need for monitoring the test lighting.