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Session 5

LED: Fact or Fiction

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FACT

- DOE report, May 2010, Next Generation Lighting Alliance, opening sentence.

“Surprisingly to many, the true reliability and lifetime of light-emitting diode (LED) lighting systems is currently unknown”

further down

“The statement of 100,000 hours of LED lifetime has given way to the realization that there is little consistency, very little published data, and few hard facts around so-called luminaire lifetime numbers.”

FACT?, FICTION?

- LED is the most efficient light source available
What is efficiency? Lumens/watt? \$/Lumen?
- LED has changed enough to allow cost-effective solutions
Change is drop in cost, increased lumens/watt
- LED lamps last longer than any other conventional source
The standards for judging them don't apply

FACT?, FICTION?

- LED costs less to maintain through reduced maintenance frequency and reduction in utility costs
Maintenance is anecdotal. Can't run to BigBox and get a replacement either.
- LED lamps are very resilient and virtually waterproof
No standard for IP67 for LED
- LED lamps are durable, shock and vibration proof
OK, So?

FACT?, FICTION?

- LEDs are smaller and more compact, providing more light output per square inch than any other light source
No light source is judged by “light output per sq. in.
- LED lamps are much safer, produce little heat, no UV rays and have no mercury

Almost true, except the heat from the driver will remove fingerprints and they produce UVa rays

So What is FACT?

- They are coming down in cost and improving lumens/watt.
 - Average is about 67 lumens/watt and cost is about \$8.00/watt(in a fixture)
- They don't produce UVb or UVc ray
- They don't have mercury
- Guarantee averages 5 years, but some companies offer 12, even though they have only been in business 4.

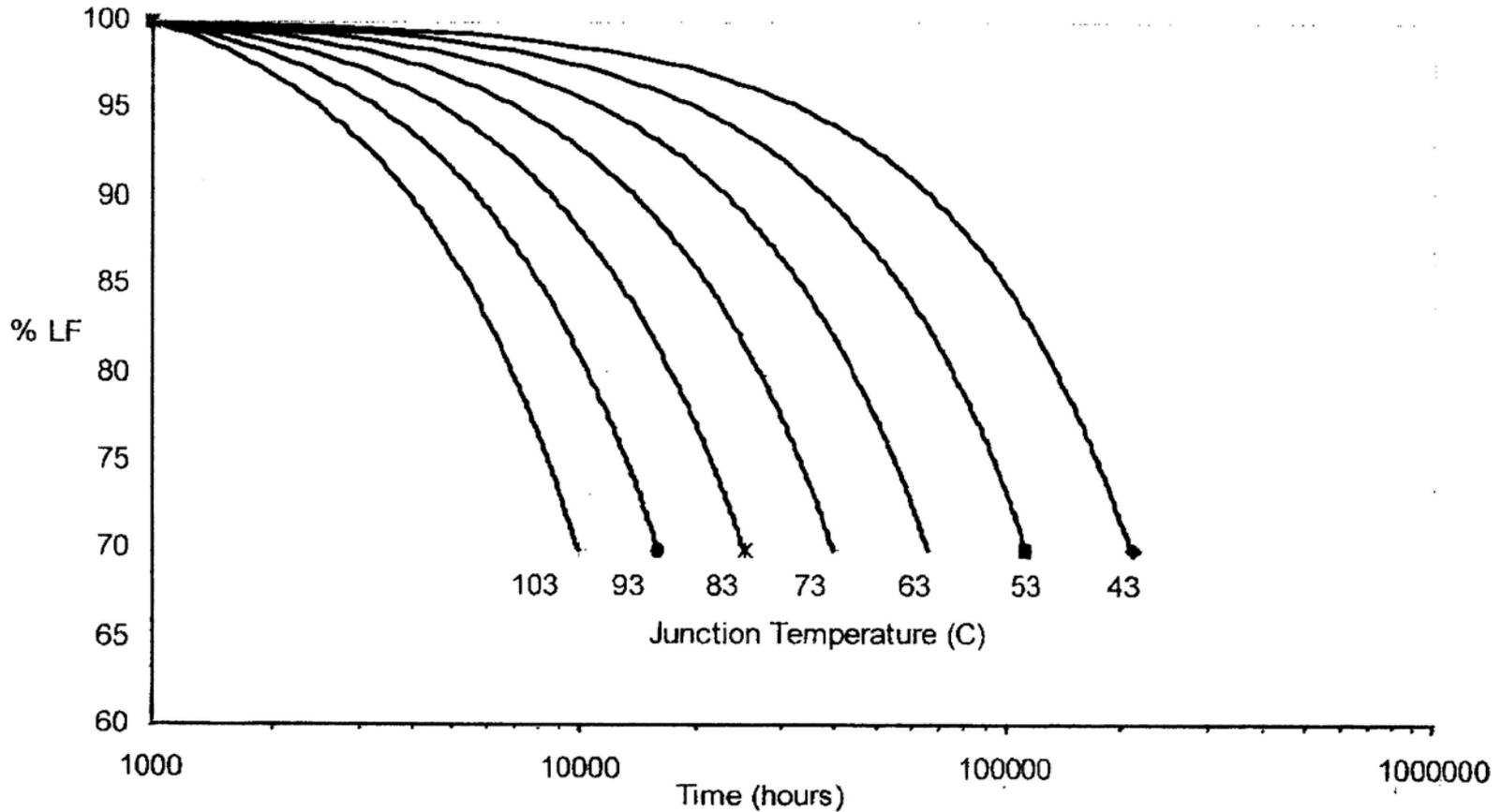
FACT!

- The marketing for the products usually don't match the performance.
 - Review any CALiPER study, 9th edition came out 01/10
- Heat is the most important issue with LED, just like any other light source.
 - HEAT KILLS LAMPS
 - Junction temp variables are drive current, thermal path, and ambient temperature
- Ambient temperatures contribute to premature failure.
 - Every 1.8F degrees in rise over the spec permanently causes .5 lumen degradation
- T8 sockets ARE NOT warrantied when an LED tube replaces a T8.

LM79 and LM80

- Only real tests available for LED, if they don't have that data, RUN!
- LM79 tests light output over time, but is limited because standards are judged at 1000 hours and 6000 hours and then extrapolated.
- LM80 test degradation i.e. color shifts over lifetime. It is expensive to run and no lifetime testing has been agreed to as yet.

HEAT KILLS LAMPS!



Questions??

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