



# Energy Star Registration

**Puneet Randeo**

*Underwriters Laboratories India*



# Global Market Acceptance

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Our Marks are on more than 23 billion products worldwide, per year, signaling peace of mind to consumers, customers, businesses and governments.

**23 BILLION** UL MARKS APPEAR ON PRODUCTS ANNUALLY

**2 BILLION**  
CONSUMERS  
WERE REACHED  
BY UL IN ASIA,  
EUROPE  
AND NORTH  
AMERICA

MORE THAN  
**500K**  
FOLLOW-UP  
INSPECTION  
VISITS WERE  
CONDUCTED  
BY UL

**19,722**  
TYPES OF PRODUCTS  
EVALUATED BY UL

**1,413**  
CURRENT STANDARDS  
FOR SAFETY PUBLISHED  
BY UL

**88,189**  
PRODUCT EVALUATIONS  
CONDUCTED BY UL

**160,881**  
NUMBER OF ACTIVE  
FILES



# UL's Performance Labs and Experts

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## **India and Middle East Region**

Photometric Testing & HVAC Testing

UL India Pvt LTD.

Manesar, Gurgaon

## **European Region**

Photometric Testing and Safety Testing

Milan, Italy

## **Asia Region**

Full Photometric Testing & Appliance Performance Testing

Nansha, China

## **North American Region**

Full Photometric Testing & Manufacturing of Gonio Photometers

Allentown, PA and Scottsdale, AZ USA



**All of our labs are ISO 17025 Accredited**



# Energy Efficiency Program Updates ENERGY STAR®



# ENERGY STAR® Program Overview

## Overall Goal:

- Keep Pace with Evolving New Technology while Preserving & Enhancing Consumer Confidence in the ENERGY STAR® Brand.



- U.S. EPA & DOE Assumed New Roles to Enhance Program :
  - EPA: Brand Manager - New Products, Marketing & Outreach, Product Database
  - DOE: Technical Support - Test Procedures, Monitoring & Verification, Metrics

# ENERGY STAR® Program Overview

## What Has Changed?

In 2011, Program changed from Self-Declaration to Third-Party Certification.

## EPA Recognized Laboratories

- Products must be tested at EPA recognized laboratories
- Labs must be Accredited by EPA recognized Accreditation Bodies

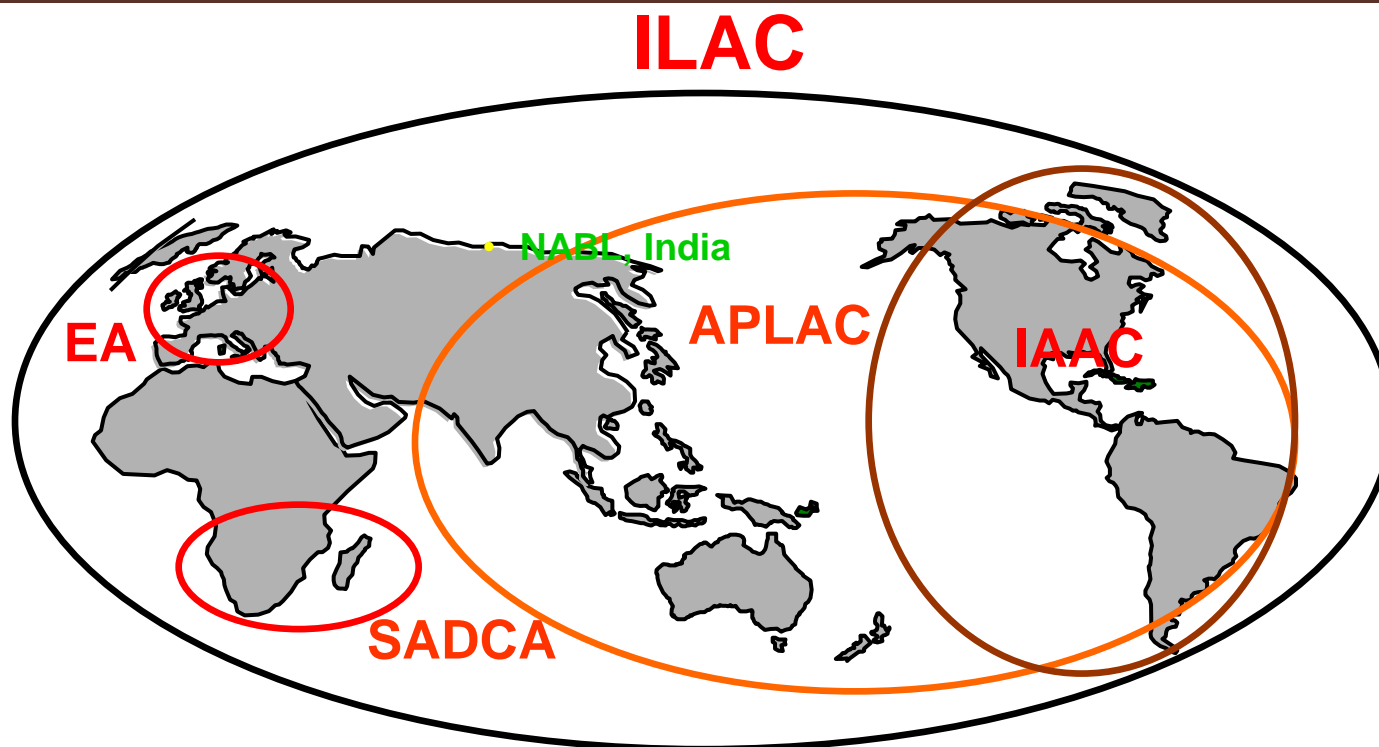
## EPA Recognized Certification Bodies

- New ENERGY STAR® products must be qualified through an EPA recognized Certification Body for approval

[www.energystar.gov/testingandverification](http://www.energystar.gov/testingandverification)



# Accreditation : Global Picture



<b>EA</b>	European co-operation for Accreditation
<b>APLAC</b>	Asia Pacific Laboratory Accreditation Cooperation
<b>ILAC</b>	International Laboratory Accreditation Cooperation
<b>SADCA</b>	Southern African Development Cooperation for Accreditation
<b>IAAC</b>	Inter-American Accreditation Cooperation

# ENERGY STAR® Eligible Lighting Products

Luminaires



Integral LED Lamps



Compact Fluorescent Lamps



Decorative Light Strings

Ceiling Fan Light Kits





# ENERGY STAR® Ineligible Lighting Products

The following Product Categories are **NOT** Eligible for ENERGY STAR:

## Linear LED Products



## Outdoor Street & Area Lighting



**BUT eligible for Design Light Consortium (DLC).**





# ENERGY STAR® Luminaire Program Requirements



# Luminaire Categorization

## Directional

Test Luminaire Photometry



## Non-Directional

Test Bulb/Source Photometry



# ENERGY STAR® Test Requirements

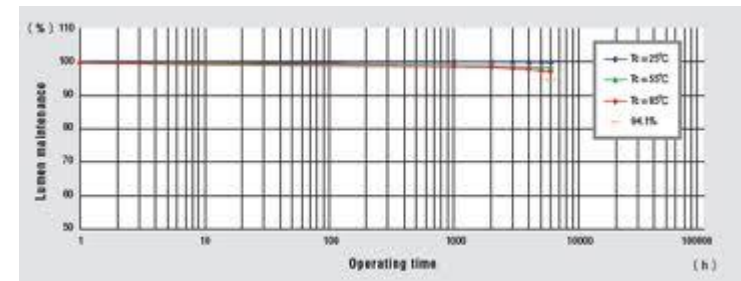
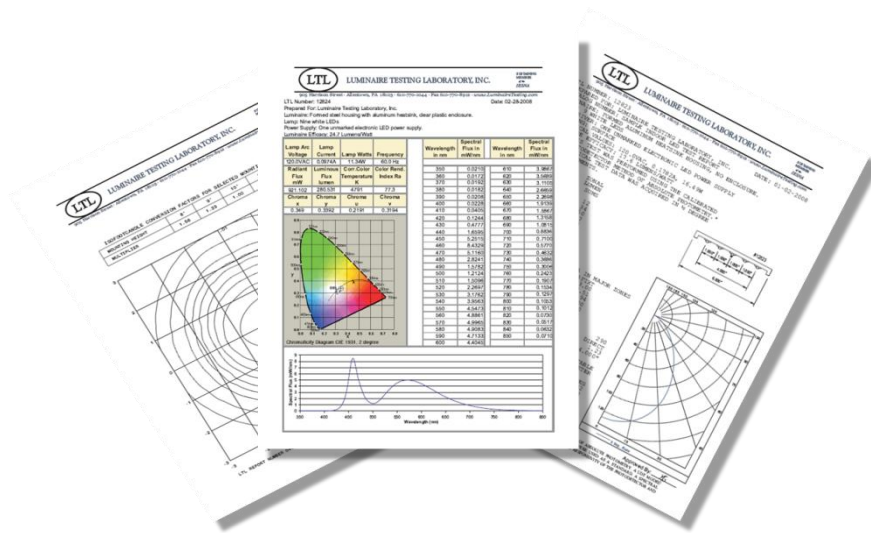
## Two Most Common Reference Standards for LED Products

### IESNA LM-79

Details Testing Procedures for the  
Photometric & Electrical Performance  
of an LED Luminaire

### IESNA LM-80

Details Testing Procedures for the  
Lumen  
Maintenance Testing of Individual LED's.



# ENERGY STAR® Test Requirements

## Luminaires

- Luminous Efficacy, Lumen Output, & Zonal Lumen Density (IESNA LM-79)
- Correlated Color Temp. (CCT), CRI, & Chromaticity (IESNA LM-79)
- Color Uniformity & Color Maintenance
- Lumen Maintenance
  - Option # 1 - LM-80 Test Data from EPA Recognized Test Lab
  - Option # 2 - 6,000 Hour Lumen Maintenance Test
- Starting & Run-Up Time
- Dimming
- Power Factor
- Transient Protection
- Lamp Current Crest Factor
- Off-State Power Consumption
- Operating Frequency
- Noise Test
- Max. Measured Ballast or Driver Case Temperature
- Must Meet Applicable UL Safety Standards & FCC Requirements
- LM-82 - Characterization of LED Light Engines and Integral LED Lamps
- TM-21 – Projecting Long Term Lumen Maintenance of LED Light Sources



# New Standard TM-21

## Projecting Long-Term Lumen Maintenance of LED Light Sources

Covers LED Packages, arrays, modules.  
Necessary for the calculation of LED Lumen

Maintenance using LM-80 data (Option 1)

Option 1 : Requires both LM80 and TM21 data, to extrapolate and predict lumen maintenance

No SSL luminaire can be qualified under Option 1 until IEC TM-21 is published.

Option 2: LM79 testing at 0 hours and 6000 hours  
- Continuous interim operator in accordance with UL1598/1574 or UL153

Statistically significant sample size of 20 units

EPA uses its own calculation and w.e.f February 2012



# Energy Star Luminaires v1.1

## Also Includes:

- Provisions for high intensity discharge luminaires (HID) were added
- Outdoor halogen luminaires have photo/motion sensor requirements
- Efficacy levels were raised for most products
- 3 year warranty applies to fixture and bulbs
- Minimum light output requirements



# Luminaires V1.1 Specification timing

The Luminaires V1.1 specification replaces the Residential Light Fixtures (RLF, V4.2) and Solid State Lighting Luminaires (SSL, V1.3) Specifications.

- Since Sept 15<sup>th</sup> 2011, evaluations under the historical Residential Lighting Fixture V4.2 and Solid State Lighting Luminaires V1.3 specifications transitioned to the new Luminaires V1.1 specification.







# ENERGY STAR® Lamps

## Test Criteria



# ENERGY STAR® Lamp Test Program

## CURRENTLY: Two Separate Programs

- CFL Lamp Program Requirements V4.2
- Integral LED Lamp Program Requirements V1.4

## PROPOSED: One Consolidated Program Merging CFL & LED Lamps

- Lamps Specification Draft V1.0



# Highlights of Lamps Specification Draft V1.0

- Overall Test Procedures remain primarily unchanged.
- Slight Increase in Efficacy, to remain consistent with Energy Independence and Security Act of 2007 (EISA).
- Attempts to Address Remaining Consumer Barriers by Offering improvement to:
  - Lamp Start & Run-Up Time
  - Color Consistency (CCT, CRI)
  - Reliability and High-Heat & Frequent Switching Applications
- Improved Lamp Labeling & Packaging Requirements
- Aligns Lamp Life Test Requirements Across Technologies





# U.S. D.O.E. Lighting Facts Program



# DOE's Lighting Facts Program

## What is it?

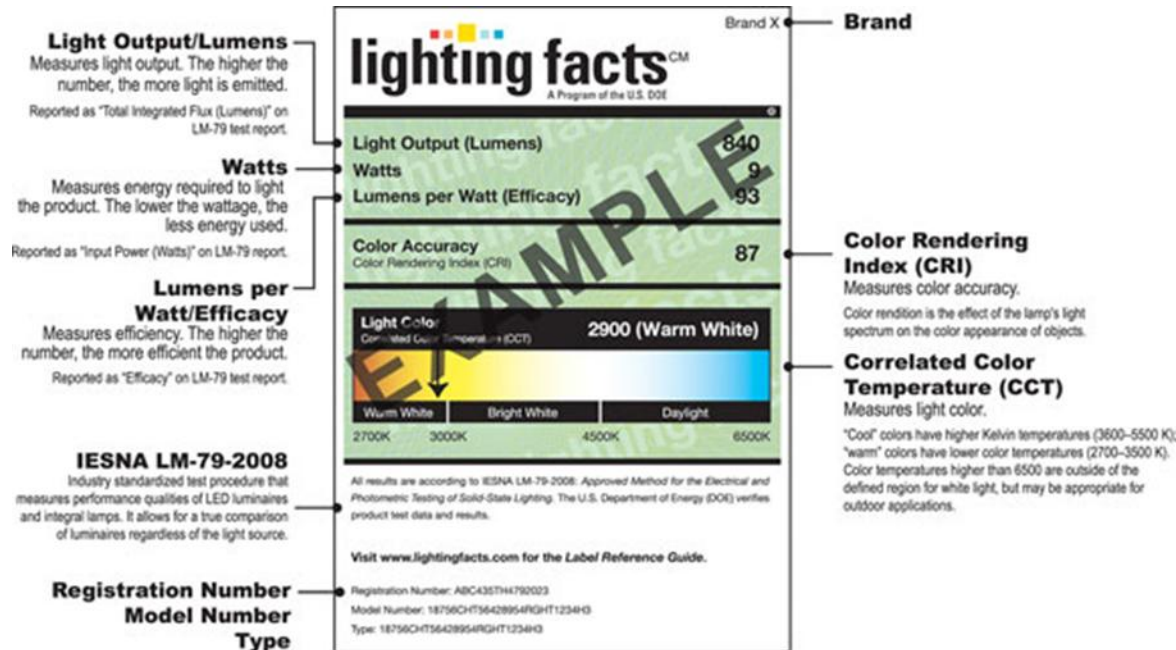
- Voluntary Program which provides a tool to Buyers, Specifiers, and Designers to help them sort through the flood of LED Products entering the market.
- (\*\*NOTE – Program is now mandatory for ENERGY STAR approved Integral LED Lamps)
- Lighting Facts Label presents independently verified LM-79 performance data in a standardized format.
- Manufacturers pledge to use the label
- Retailers, Distributors, Utilities, Energy Efficiency Organizations, and other Lighting Professionals pledge to look for and use products that bear the label.

## Statistics (As Presented in DOE-SSL Postings by Jim Brodrick 8/27/10)

- Over 4,000 LED Lighting Products Registered with Lighting Facts.
- Over 400 Manufacturers
- Over 125 Retailers & Distributors
- Over 160 Lighting Professionals (Designers, Specifiers, Utilities, EEOs)



# DOE's Lighting Facts Program Label



Makes Critical Information Readily Available on Product Packaging

# Lighting Facts Program Update

- Recently Published 3<sup>rd</sup> Lighting Facts Product Snapshot which analyzes performance of Indoor & Outdoor LED Luminaires registered with Lighting Facts.
- Will be adding a new label metric for lumen maintenance and warranty which will utilize the new TM-21 methodology to project a lumen maintenance percentage at 25,000 hours.
- Continuing Spot-Check Testing to verify ongoing performance of registered Lighting Facts Products.
- Now added listing of utility programs that offer incentives on LED products ([www.lightingfacts.com/utilityprograms](http://www.lightingfacts.com/utilityprograms))





# Design Lights Consortium





# Design Lights Consortium

## What is DLC?

- DLC is a collaboration of Utilities and Regional Energy Efficiency Organizations committed to increasing awareness of the benefits from Efficient Lighting in commercial buildings/applications.
- DLC's Goal is to ensure that high-quality, energy-efficient lighting design becomes commonplace in all lighting installations.
- Who is involved? Sponsors can be found at:  
<http://www.designlights.org/solidstate.sponsors.php>
- DLC's Qualified Products List (QPL) Members are made up of Utilities and Energy Efficiency Programs who have been asked to offer incentives for SSL Fixtures (primarily those types which are not ENERGY STAR labeled).



# Design Lights Consortium

## What Products are Covered?

- Outdoor Pole/Arm Mounted Area & Roadway Luminaires
- Outdoor Pole/Arm Mounted Decorative Luminaires
- Outdoor Wall-Mounted Area Luminaires
- Parking Garage Luminaires
- Track or Mono-Point Directional Lighting Fixtures
- Refrigerated Case Lighting
- Display Case Lighting
- Linear Panels (2 x 2 Troffer Only)
- High-Bay & Low-Bay Fixtures for Commercial / Industrial Buildings
- High-Bay Aisle Lighting



### *Are Product Families Allowed?*

YES, but certain conditions apply. Will only accept worst case family submittals for 1) Changes in housing that do not affect photometric performance, and 2) Changes in CCT where the lowest CCT is worst case.

# Design Lights Consortium

## Test Lab Requirements

Independent Testing Lab Requirements	
In situ Temperature Measurement Test	<p>Similar to ENERGY STAR requirements, DLC will accept ISTMT results from laboratories approved by OSHA as Nationally Recognized Testing Laboratories (NRTLs). Alternatively, DLC will accept ISTMT results from independent laboratories qualified under the DOE CALiPER testing program as listed at <a href="http://www1.eere.energy.gov/buildings/ssl/test_labs.html">http://www1.eere.energy.gov/buildings/ssl/test_labs.html</a> under the heading "CALiPER Testing Laboratories, Laboratories Qualified, Verified, and Contracted for 2009 CALiPER LM-79 Testing and LM-79 Testing for ENERGY STAR for SSL".</p> <p>Alternatively, ISTMT may be carried out by laboratories recognized through UL's Data Acceptance Program. (Referenced in the Manufacturer's Guide pg.7)</p>
LM 79	<p>Testing must be conducted by a <b>NVLAP accredited lab</b>. If your lab does not officially have this accreditation then you must go through a CALiPER lab on this list: <a href="http://www1.eere.energy.gov/buildings/ssl/test_labs.html">http://www1.eere.energy.gov/buildings/ssl/test_labs.html</a> (Referenced in the Manufacturer's Guide pg.6 &amp; 8)</p>
LM 80	DLC will accept LED package in-house testing until September 30, 2010

Test Data must come from NVLAP Accredited or CALiPER Approved Labs





Questions??

