



# ENERGY STAR® Luminaires Specification

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**March 9, 2011**

This document is a corrected version of the original webinar that takes into account questions about test procedures that were raised during the March 9, 2011 webinar.

# Agenda



- ENERGY STAR Luminaires program overview
- Directional/Non-Directional categories
- Certified Lighting Subcomponent Database
- LED light engines
- IES LM-82 and TM-21
- EPA Recognition of Laboratories
- Steps to participate
- Timeline for specification implementation
- Questions

# ENERGY STAR Luminaires Program Overview



Residential Light Fixtures V4.2  
(RLF)

Solid State Lighting Luminaires V1.3  
(SSL)

## ENERGY STAR Luminaires V1.0

- finalized February 16, 2011
- effective October 1, 2011

- In Spring of 2010, EPA began the development of a technology-neutral ENERGY STAR Luminaires specification to replace the existing RLF and SSL specifications.
- On February 16<sup>th</sup>, 2011, EPA released the new Luminaires specification.

# ENERGY STAR Luminaires: Program Overview

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- The promotion of individual technologies confuses consumers and confuses the promotion of energy-efficient lighting.
- New specifications are technology-neutral for luminous efficacy, color temperature, and color rendering.
- Technology neutrality provides an objective means to increase efficacy levels.

# ENERGY STAR Luminaires: Specification Integration

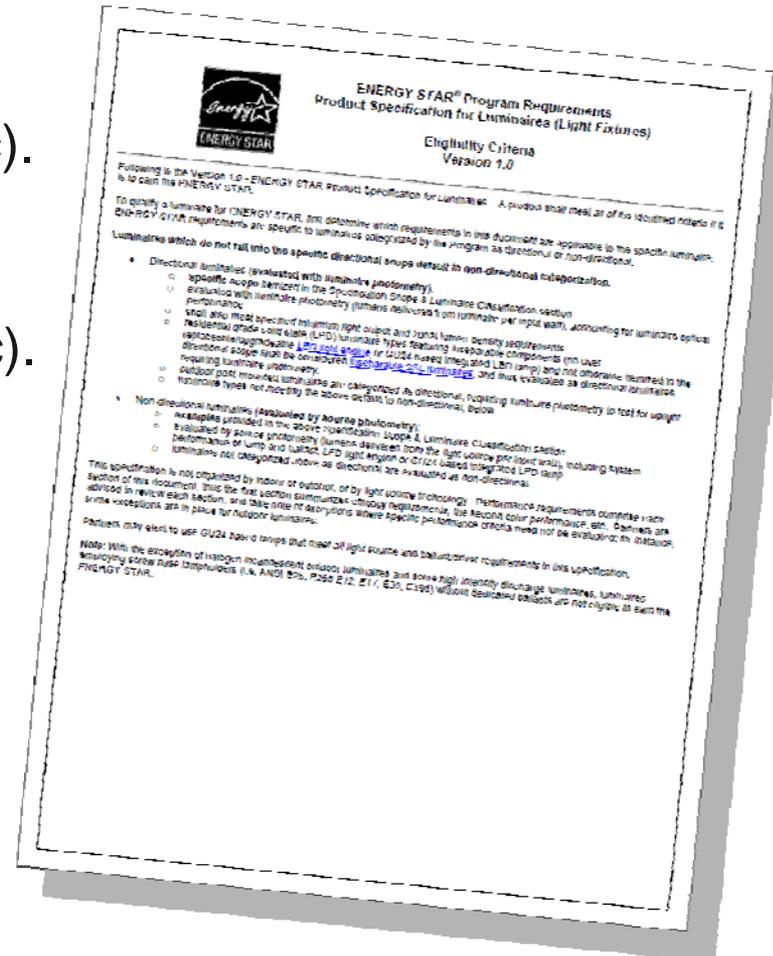


- Allows technologies to compete in the market place:
  - LEDs luminaires should be able to perform as well as fluorescent luminaires.
  - Regardless of technology, all ENERGY STAR qualified luminaires should be reliable, high-quality replacements for incandescent.
  - Simplest, most effective message: **look for the ENERGY STAR.**

# ENERGY STAR Luminaires V1.0



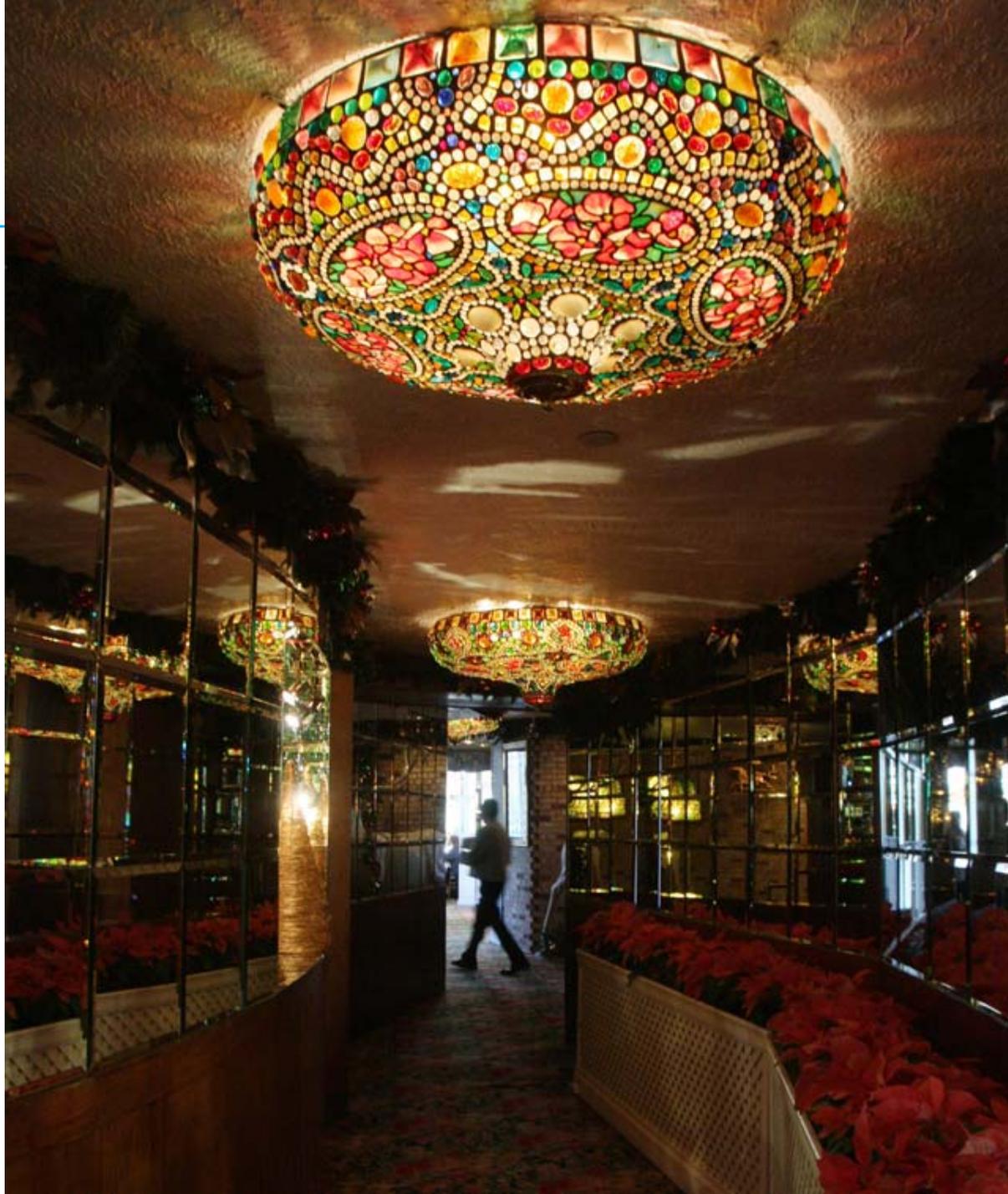
- Directional luminaires and inseparable luminaires will be tested using luminaire photometry (already required in SSL spec).
- Non-directional products with replaceable light sources will be tested using source photometry (already required in RLF spec).
- Provisions for high intensity discharge luminaires (HID) were added.
- Halogen luminaires have photo/motion sensor requirements.
- Efficacy levels were raised for most products.



# NEMA / ALA LSD 51-2009



Luminaire Description or Style	Type
<p>Chandeliers</p> 	B
<p>Recessed Down-Lights</p> 	F
<p>Wall Sconces</p> 	D
<p>Surface Mount</p> 	B
<p>Hanging Pendants</p> 	B
<p>Portable Luminaires (Table and Floor Types)</p> 	B
<p>Track</p> 	F
<p>Task</p> 	F
<p>Accent</p> 	D



# Directional/Non-Directional Categories



- NEMA/ALA Roundtable on March 4, 2010:
  - Developed consensus:
    - Visible source: test with luminaire photometry
    - Obscured source: test with source photometry
- Luminaires V1.0 spec adopts directional & non-directional categories.
  - Directional: test with luminaire photometry
  - Non-directional: test with source photometry

# Directional Luminaires



- Designed to put light on a specific surface or area.
- Evaluated with luminaire photometry: delivered lumens per input watt.
- Tested per IES LM-79 (SSL); LM-10 or LM-41 (fluorescent) and LM-31 or LM-46 (HID).
- Includes zonal lumen density (intensity distribution) requirements.
- Includes minimum light output requirements.
- Specific scope detailed in spec, includes limited number of commercial lighting products.

**Luminaires not classified as directional  
default to non-directional classification.**

# Luminaire Photometry



# Luminaire Photometry



- Suitable for measuring white light luminaires: luminous efficacy, flux, CCT, CRI.
- Less useful for highly decorative luminaires:
  - Optical losses less critical
  - Lower performance expectations
  - Colorimetry at luminaire level generates data of dubious value

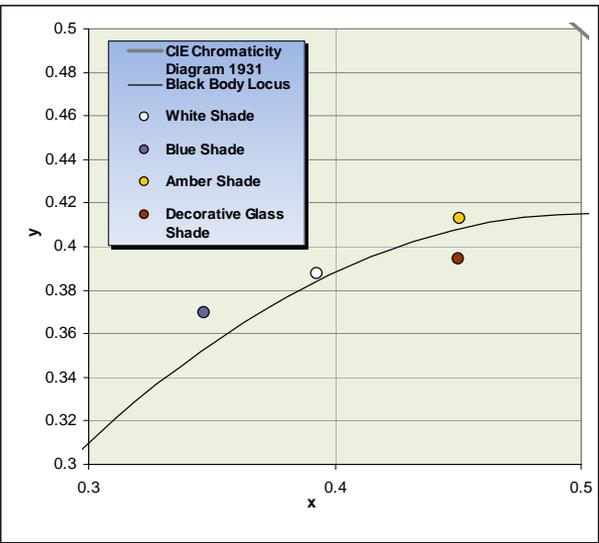
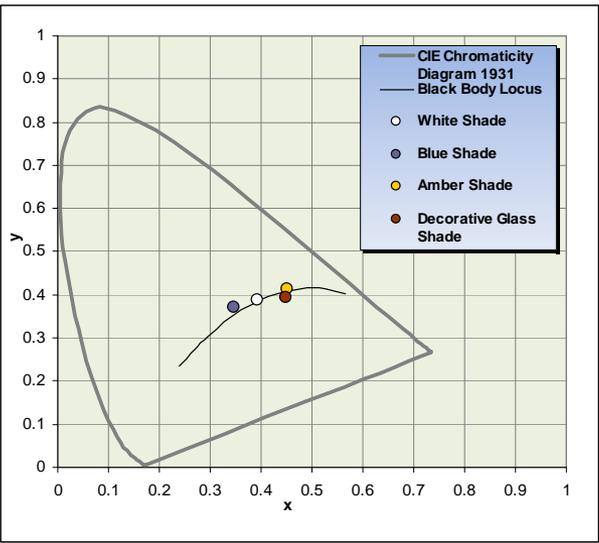


# Luminaire Photometry



- IES LM-79-08 testing conducted at the Lighting Research Center (LRC) at Rensselaer Polytechnic Institute.
  - Fixtures from WAC Lighting, an LRC Partner
  - All fixtures: identical source, differing glass shades
  - Sarah series: white, amber, blue
  - Fiore series: decorative glass

# Luminaire Photometry



# Luminaire Photometry



Product Description	Ambient Temperature (°C)	Input Voltage (V)	Input Power (W)	Luminous Flux (lm)	Luminous Efficacy (lm/W)	x	y	CCT	CRI
White shade	24.7	120.11	4.48	165.0	36.83	0.3929	0.3876	3761	73.6
Blue shade	24.7	120.11	4.48	129.9	28.99	0.3468	0.3698	4998	72.0
Amber Shade	24.7	120.02	4.48	82.6	18.44	0.4507	0.4129	2851	69.0
Decorated glass	24.7	120.12	4.48	34.9	7.78	0.4499	0.3942	2711	78.1

Testing Decorative LED Fixtures Per IES LM-79-08  
 Lighting Research Center (NVLAP Lab Code: 200480-0)  
 2/13/2011

# Non-Directional Luminaires



- Evaluated with source photometry: source lumens/input watt and do not include measurement of luminaire optical losses.
- Non-Directional fixtures are not intended to illuminate specific surfaces.
- Category does not have specific scope – examples in specification.
- Includes minimum source light output requirements.
- The lamp & ballast platform, GU24 self-ballasted lamp, GU24 integral LED lamp, or LED light engine sources can also be listed in the Certified Lighting Subcomponent Database and can be used in many different fixtures.

# Fluorescent/HID Luminaires



Directional:

Accent, Cove, Downlight,  
Outdoor post-top, Under  
Cabinet, Desk Task



Luminaire Photometry

Non Directional:  
Everything Else



Source Photometry

# Main Changes for Fluorescent Products



- NEMA/ALA Matrix will be replaced with a new database of tested and third-party certified subcomponents.
- 3 year warranty applies to luminaire & source.

# Solid State Lighting Luminaires



## Directional:

Accent, Cove, Downlight,  
Outdoor post-top, Under  
Cabinet, Desk Task and  
inseparable luminaires



Luminaire Photometry

## Non Directional:

Replaceable LED Light  
Engine  
GU24-based Integral LED  
Lamp



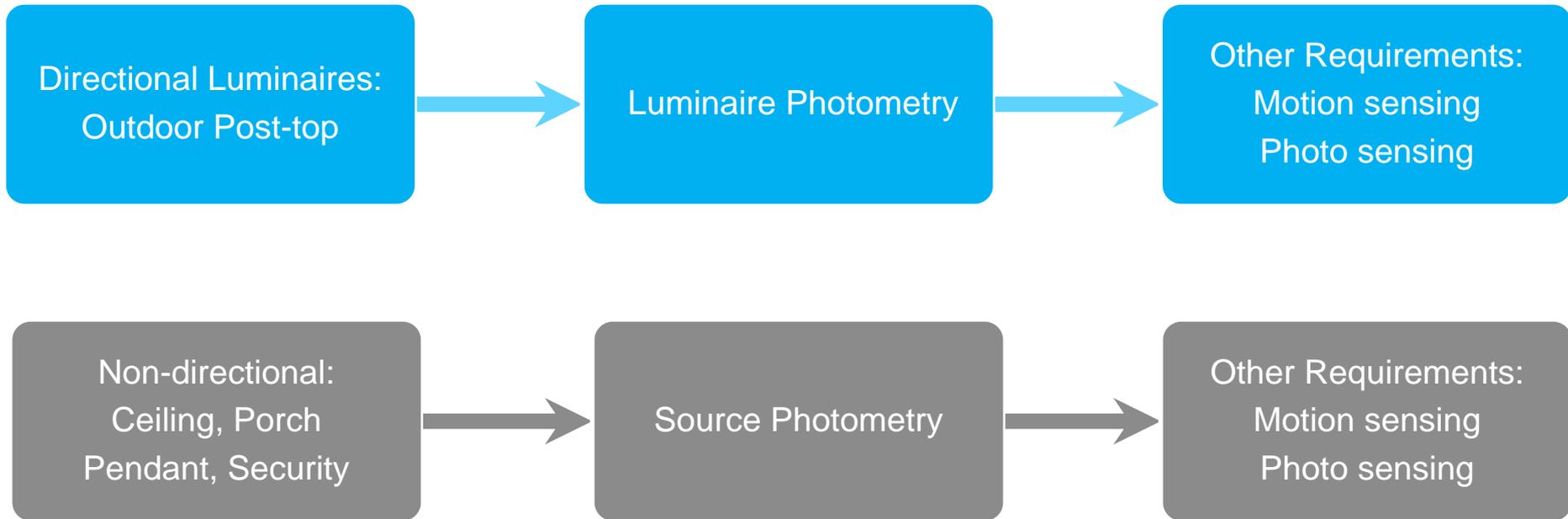
Source Photometry

# Main Changes for SSL Products



- Sample size increased to 3 luminaires, all 3 must meet the requirements.
- IES LM-80 sample size changed to 20 units to align with IES TM-21 recommendations. Sample size is the same for LED packages, arrays or modules.
- Non-directional luminaires must employ replaceable LED light engines or GU24 integrated LED lamps, and must meet source efficacy of 65 lm/W.
- Non-directional luminaires without source replaceability are classified as “inseparable SSL luminaires” – see Directional requirements: 70 lm/W luminaire efficacy, no zonal lumen density requirements.

# Halogen Luminaires (Outdoor Only)



# Certified Lighting Subcomponent Database (CSD)



**NEMA/ALA Lamp and Ballast Platform Matrix**

**Welcome!**

Working with the lighting industry, the National Electrical Manufacturers Association (NEMA) and the American Lighting Association (ALA) developed matrices of lamp and ballast combinations that, when used in residential lighting fixtures, are designed to meet certain ENERGY STAR® performance requirements as defined in the U.S. Environmental Protection Agency's ENERGY STAR for Residential Light Fixture Eligibility Criteria, Version 4.2.

**IMPORTANT NOTICE REGARDING THE NEMA/ALA MATRIX AND ENERGY STAR QUALIFICATION**

Ballast and Lamp manufacturers should submit only additional components using these matrix templates. Completed matrix templates should be forwarded to ICF International for review at [icfi@icfi.com](mailto:icfi@icfi.com).

For changes to components currently listed, please contact [icfi@icfi.com](mailto:icfi@icfi.com) for an abridged process.

- [Cover Letter](#) (PDF: 1.98mb)
- [Ballast Matrix Template 2008](#) (Excel: 27k)
- [Lamp Matrix Template 2008](#) (Excel: 28k)
- [LBM Agreement 2005](#) (PDF: 26k)
- [NEMA/ALA Matrix Instructions](#) (Word: 73k)

Click on the appropriate button to view the corresponding matrices and approval letters:

**Lamps**      **Ballasts**

This site is sponsored by:

**EPA Approved Platform Database**

The Platform Database consists of EPA-approved platforms and qualified GU24 base integrated lamps that have been reviewed to meet the ENERGY STAR Program Requirements for Residential Light Fixtures, Version 4.2. When using approved platforms or qualified GU24 base integrated lamps, Partners should refer to the Platform Database for the applicable Platform Approval Numbers and include them in the QPI Smart Form for ENERGY STAR Residential Light Fixture submittals.

[Click Here to Search for EPA-Approved Platforms and Qualified GU24 Base Integrated Lamps](#)  
[Click Here to Browse EPA-Approved Platforms and Qualified GU24 Base Integrated Lamps](#)  
[Click Here to View Revoked Platforms Approvals](#)

**NEMA/ALA Lamp and Ballast Platform Matrix**

The National Electrical Manufacturers Association (NEMA) and the American Lighting Association (ALA) developed matrices of lamp and ballast combinations that, when used in residential lighting fixtures, are designed to meet certain ENERGY STAR performance requirements as defined in the ENERGY STAR Program Requirements for Residential Light Fixtures, Version 4.2. Partners may use these matrices as a source for obtaining required information to qualify residential fixtures. When using these matrices, one or more lamps from the lamp matrix should be appropriately paired with a ballast from the ballast matrices. The data for each should then be copied from the matrices onto the QPI Smart Form for ENERGY STAR Residential Light Fixture submittals.

[Click Here to View the Lamps and Ballasts Listed in the NEMA/ALA Lamp and Ballast Platform Matrix](#)

**QPI Smart Form**

The Qualifying Product Information (QPI) Smart Form is used to qualify residential light fixtures and/or GU24 based integrated lamps.

[Click Here to Qualify a Product with the QPI Smart Form](#)

The NEMA/ALA Matrix and EPA Approved Platform Database will be replaced by the Certified Lighting Subcomponent Database.

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

# Certified Lighting Subcomponent Database (CSD)



- Operational by March 31, 2011.
- Will include third-party certified performance data:
  - Lamps: fluorescent, HID
  - Ballasts: fluorescent, HID
  - Lamp & ballast platforms (system performance)
  - GU24 self-ballasted lamps: fluorescent, HID
  - GU24 based integral LED lamps (when IES LM-82 is finalized)
  - LED light engines (when IES LM-82 is finalized)
- Possibly: LED package/array/module lumen maintenance data based on IES LM-80 tests and IES TM-21 projections.

# LED Light Engines



## LED Light Engine:

An integrated assembly comprised of LED packages (components) or LED arrays (modules), LED driver, and other optical, thermal, mechanical and electrical components. The device is intended to connect directly to the branch circuit through a custom connector compatible with the LED luminaire for which it was designed, and does not use an ANSI standard base (IES RP-16-10).

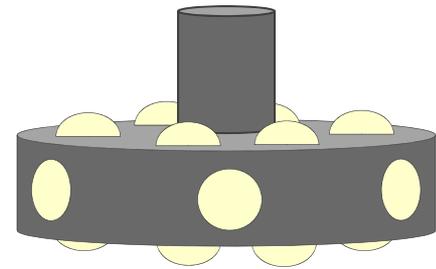
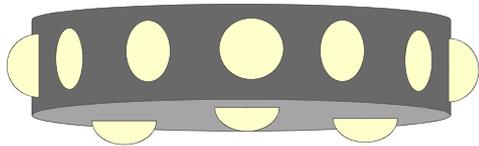
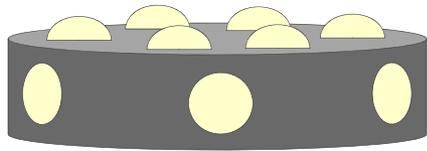


# LED Light Engines

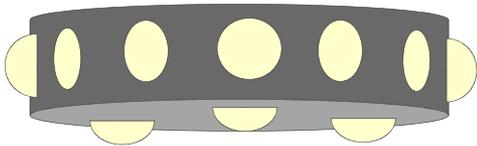
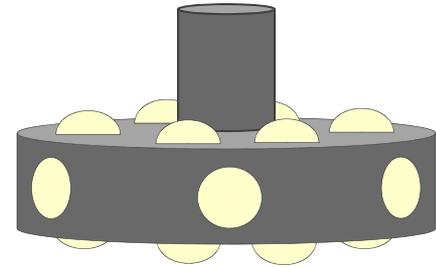
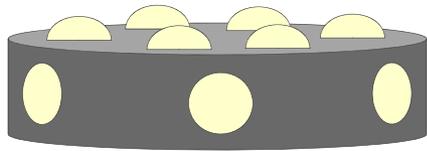


- Two ways to envision LED light engines:
  - As an object: a mechanically integrated unit
  - As a concept: a combination of LED driver + array
- Both testable using IES LM-82.
- GU24 based integrated LED lamps will also be testable per IES LM-82.

# LED Light Engines



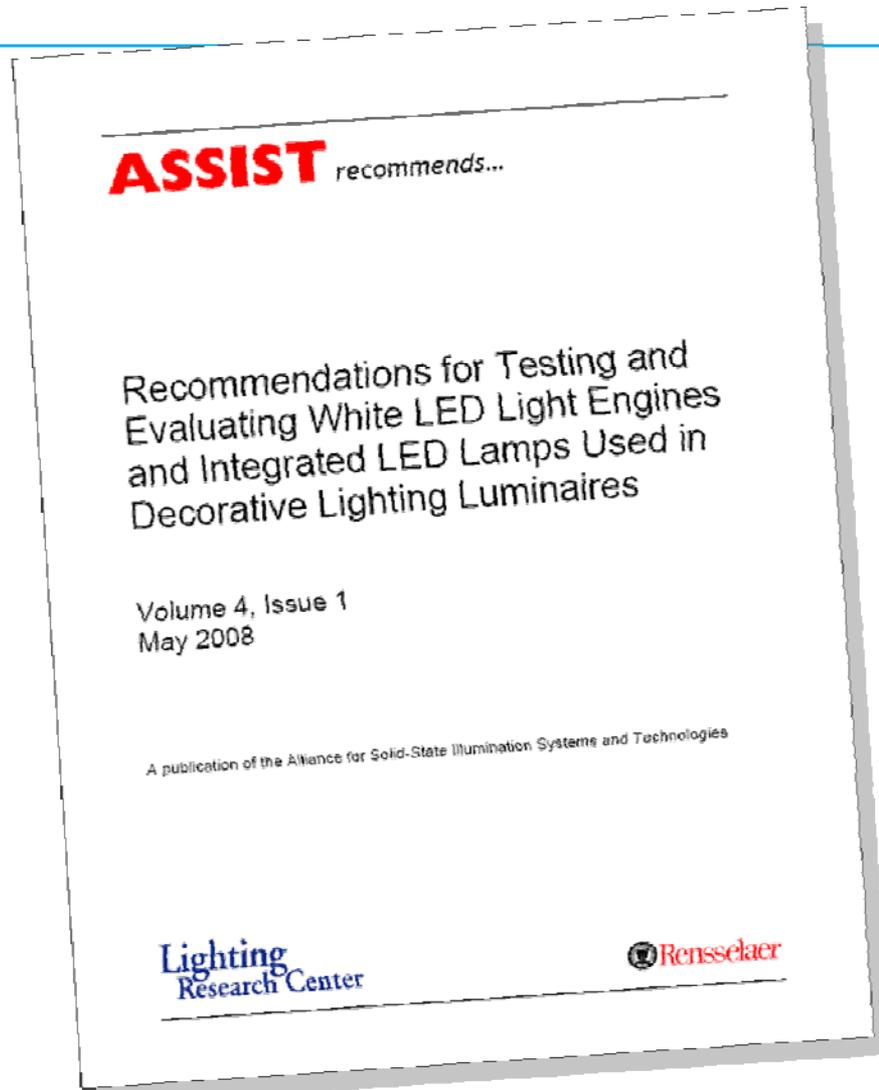
# LED Light Engines



# LED Light Engines

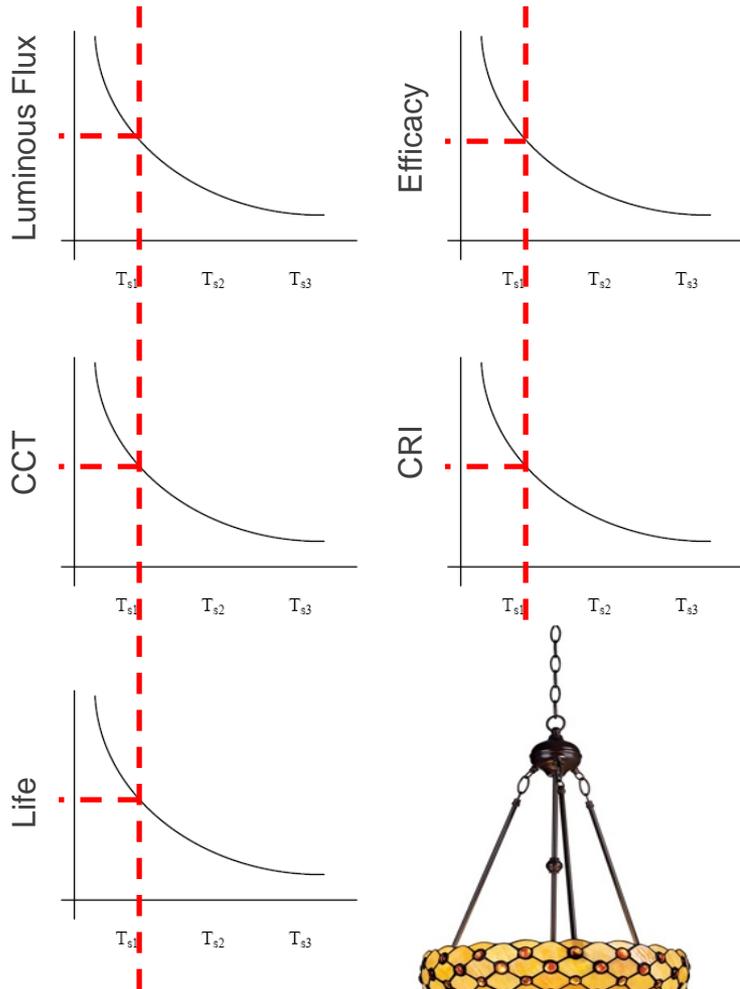


# ASSIST: Recommendations for Testing and Evaluating White LED Light Engines

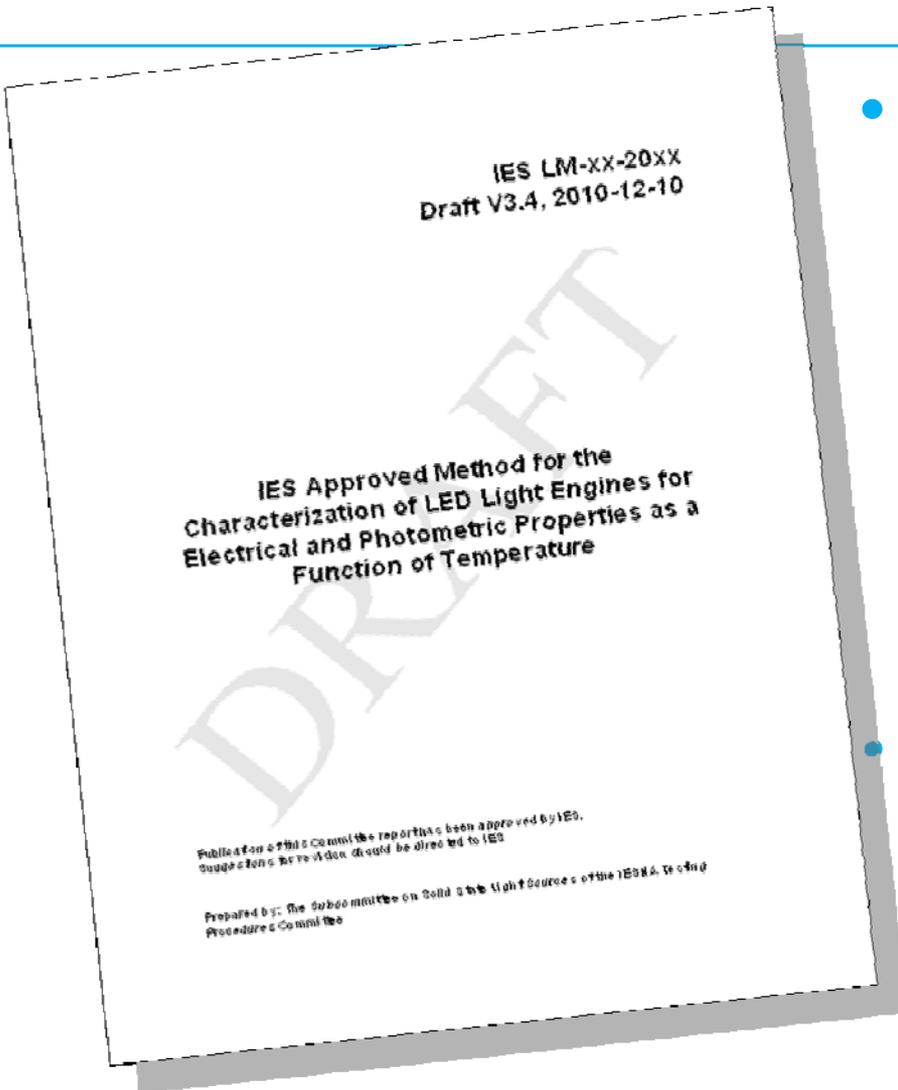


- At 60 C, 90 C and 120 C, measures:
  - Luminous flux (lm)
  - Luminous efficacy (lm/W)
  - Correlated color temperature (K)
  - General color rendering index ( $R_a$ )
  - Active power (W)
  - Power factor

# Testing LED Light Engines



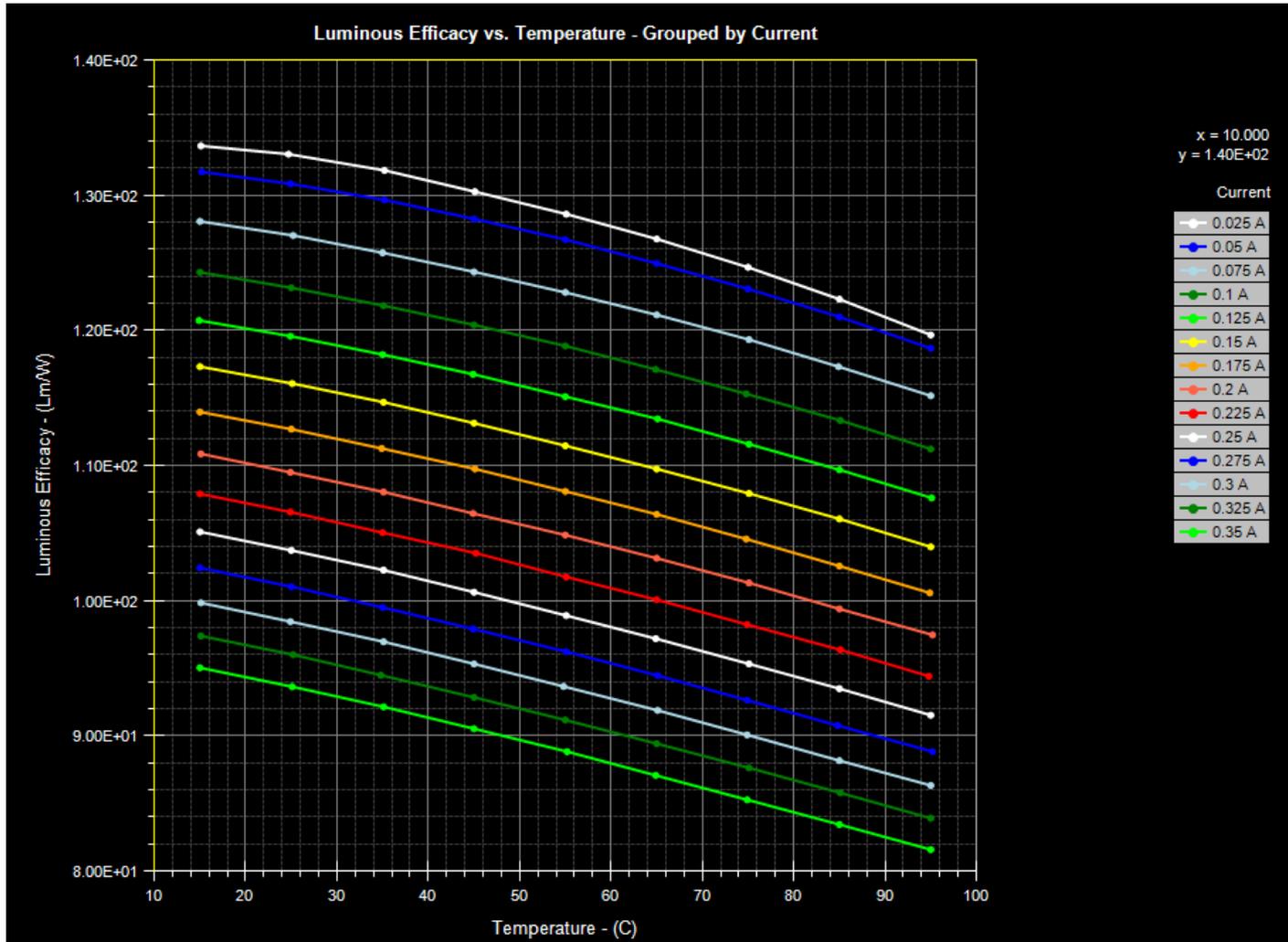
- Luminaire's in-situ operating temperature is used to determine how the LED light engine will perform in that fixture.
- In situ temperature is compared to the LED light engine's data curves to determine anticipated performance of the LED light engine when installed in the fixture.
- Example: in situ temperature is  $63^{\circ}\text{C}$ .



- IES LM-82-11: Approved Method for the Characterization of LED Light Engines and Integrated LED Lamps for Electrical and Photometric Properties as a Function of Temperature.
- IES LM-82 is not yet final but is required to test and certify non-directional fixtures using LED light engines or GU24 integrated LED lamps.

- Test procedure for evaluation of white LED light engines.
- **References IES LM-79 for all photometric and electrical measurements.**
- Essentially: “*LM-79 as a function of temperature*”
- Tests photometric, electrical performance at elevated temperatures:
  - Luminous flux (lm)
  - Luminous efficacy (lm/W)
  - Correlated color temperature (K)
  - General color rendering index ( $R_a$ )
  - Active power (W)
  - Power factor

# IES LM-82-11



# IES TM-21-11



- IES TM-21-11: Projecting Long-Term Lumen Maintenance of LED Light Sources, currently in draft, should be complete by June.
- Covers LED packages, arrays, modules.
- Statistically significant sample size of 20 units recommendation adopted in Luminaires specification requirements.
- IES TM-21 is necessary for calculation of LED lumen maintenance using IES LM-80 data (Option 1).



# IES TM-21 and Lumen Maintenance



- Option 1: Requires both IES LM-80 data of LEDs and IES TM-21 extrapolation to predict lumen maintenance.
  - No solid state luminaires can be qualified under Option 1 until IES TM-21 is published.
- Option 2: IES LM-79 testing of the fixture at 0h and 6000h with continuous interim operation in accordance with ANSI/UL 1598/1574 or 153.



# EPA Recognition of Laboratories

# Testing Requirements



- EPA recognizes lighting laboratories for photometric tests only.
  - Fluorescent
  - HID
  - SSL
  - Halogen
- Electrical safety testing must be carried out by an OSHA Nationally Recognized Testing Laboratory (NRTL).
- Electro-Magnetic Interference testing must be carried out by a FCC listed laboratory.  
<https://fjallfoss.fcc.gov/oetcf/eas/reports/TestFirmSearch.cfm>

# Testing Requirements



- For the Certified Lighting Subcomponent Database (CSD), EPA recognizes laboratories for
  - Fluorescent Ballasts
  - Fluorescent Lamps
  - HID Ballasts
  - HID Lamps
  - LED Light Engines
  - GU24-based Integrated LED Lamps
- An EPA-recognized laboratory for Non-Directional Luminaires may also test self-ballasted lamps and lamp-ballast platforms for inclusion on the CSD.

# Luminaires: Fluorescent

## Test reports required for certification



Product certification for a fluorescent luminaire requires that source/ballast/platform is listed on the CSD or test reports are submitted by an EPA recognized lab for:

- ANSI C78.376-2001
- ANSI C78.5-2003
- ANSI C82.11 Consolidated 2002
- ANSI C82.2-2002
- CIE Publication No. 13.3-1995
- CIE Publication No. 15-2004
- IES LM-9-1999
- IES LM-40-2001
- IES LM-65-2001
- IES LM-66-2000

Product certification of a directional luminaire requires additional test reports from an EPA recognized lab for the following test procedures :

- IES LM-10-1996 and/or LM-10-2011
- IES LM-41-1998 and/or LM-41-2011



# Fluorescent Test Procedures

Requirement Category	Luminaire-specific Test or CSD	Test Procedures		
CCT	CSD	ANSI	<a href="#">C78.376-2001</a>	Specifications for the Chromaticity of Fluorescent Lamps
Source Run up time	CSD	ANSI	<a href="#">C78.5-2003</a>	Specifications for Performance of Self-ballasted Compact Fluorescent Lamps
Source Start Time, Lamp Current Crest Factor	CSD	ANSI	<a href="#">C82.11 Consolidated-2002</a>	High-Frequency Fluorescent Lamp Ballasts—Supplements
PF, Operating Frequency	CSD	ANSI	<a href="#">C82.2-2002</a>	Method of Measurement of Fluorescent Lamp Ballasts
Color Rendering	CSD	CIE	<a href="#">Pub. No. 13.3-1995</a>	Method of Measuring and Specifying Color Rendering of Light Sources
CCT	CSD	CIE	<a href="#">Pub. No. 15:2004</a>	Colorimetry
Efficacy, Output, Lumen Maintenance, CCT, CRI	CSD	IES	<a href="#">LM-9-09</a>	Electric and Photometric Measurements of Fluorescent Lamps
Light Source Life, Lumen Maintenance	CSD	IES	<a href="#">LM-40-01</a>	Life Testing of Fluorescent Lamps
Light Source Life, Lumen Maintenance	CSD	IES	<a href="#">LM-65-01</a>	Life Testing of Compact Fluorescent Lamps
Efficacy, Output, Lumen Maintenance, CCT, CRI	CSD	IES	<a href="#">LM-66-00</a>	Electrical and Photometric Measurements of Single-Ended Compact Fluorescent Lamps.
Efficacy, output, zonal lumen distribution	Specific Luminaire	IES	<a href="#">LM-10-96</a> and/or <a href="#">LM-10-11</a>	Photometric Testing of Outdoor Fluorescent Luminaires
Efficacy, output, zonal lumen distribution	Specific Luminaire	IES	<a href="#">LM 41-98</a> and/or <a href="#">LM-41-11</a>	Approved Method for Photometric Testing of Indoor Fluorescent Luminaries

# Laboratory Recognition for Fluorescent (Non Directional, Self-Ballasted Lamps and Lamp- Ballast Platforms)



Recognition for testing fluorescent non-directional luminaires or self-ballasted lamps and lamp-ballast platforms for inclusion in the CSD requires a laboratory has the following test procedures on their scope of accreditation:

- ANSI C78.376-2001
- ANSI C78.5-2003
- ANSI C82.11 Consolidated 2002
- ANSI C82.2-2002
- CIE Publication No. 13.3-1995
- CIE Publication No. 15-2004
- IES LM-9-1999
- IES LM-40-2001
- IES LM-65-2001
- IES LM-66-2000

# Laboratory Recognition for Fluorescent (Directional)



Recognition for testing fluorescent directional luminaires requires a laboratory has the following test procedures on their scope of accreditation:

- IES LM-10-1996 and/or LM-10-2011
- IES LM-41-1998 and/or LM-41-2011

# Laboratory Recognition for Fluorescent Ballasts



Recognition for testing fluorescent ballasts for inclusion on the Certified Lighting Subcomponent Database requires a laboratory has the following test procedures on their scope of accreditation:

- ANSI C82.11 Consolidated 2002
- ANSI C82.2-2002

# Laboratory Recognition for Fluorescent Lamps



Recognition for testing fluorescent lamps for inclusion on the Certified Lighting Subcomponent Database requires a laboratory has the following test procedures on their scope of accreditation: :

- ANSI C78.376-2001
- CIE Publication No. 13.3-1995
- CIE Publication No. 15-2004
- IES LM-9-1999
- IES LM-40-2001

# Luminaires: HID

## Test reports required for certification

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Product certification for a HID luminaire requires that source/ballast/platform is listed on the CSD or test reports are submitted by an EPA recognized lab for:

- ANSI C78.389-2004
- ANSI C82.6-2005
- CIE Publication No. 13.3 – 1995
- IES LM-47-2001 and/or LM-47-2011
- IES LM-51-2000

Directional luminaires requires additional test reports for the following test procedures :

- IES LM-31-1995 and/or LM-31-2011
- IES LM-46-2004

# HID Test Procedures

Requirement Category	Luminaire-specific Test or CSD	Test Procedures		
Operating Frequency	CSD	ANSI	<a href="#">C78.389-2004 (R2009)</a>	High-Intensity Discharge (HID)—Methods of Measuring Characteristics
PF, Lamp current crest factor	CSD	ANSI	<a href="#">C82.6-2005</a>	Ballasts for High Intensity Discharge (HID) Lamps - Methods of Measurement
CRI	CSD	CIE	<a href="#">Pub. No. 13.3-1995</a>	Method of Measuring and Specifying Color Rendering of Light Sources
Light Source Life, Lumen Maintenance	CSD	IES	<a href="#">LM 47-01</a> and/or <a href="#">LM 47-11</a>	Life Testing of High Intensity Discharge (HID) Lamps
Efficacy, Light Output, CCT, CRI	CSD	IES	<a href="#">LM-51-00</a>	Electrical and Photometric Measurements of High Intensity Discharge Lamps
Efficacy, output, zonal lumen distribution	Luminaire-specific Test	IES	<a href="#">LM-31-95</a> and/or <a href="#">LM-31-11</a>	Photometric Testing of Roadway Luminaires Using Incandescent Filament and High Intensity Discharge (HID) Lamps
Efficacy, output, zonal lumen distribution	Luminaire-specific Test	IES	<a href="#">LM-46-04</a>	Photometric Testing of Indoor Luminaires Using High Intensity Discharge or Incandescent Filament Lamps

# Laboratory Recognition for HID (Non Directional, Self-Ballasted Lamps and Lamp- Ballast Platforms)



Recognition for testing HID non directional luminaires or Self-ballasted lamps and platforms for inclusion on the Certified Lighting Subcomponent Database (CSD) requires a laboratory has the following test procedures on their scope of accreditation:

- ANSI C78.389-2004
- ANSI C82.6-2005
- CIE Publication No. 13.3 – 1995
- IES LM-47-2001 and/or LM-47-2011
- IES LM-51-2000

# Laboratory Recognition for HID (Directional)



Recognition for testing HID directional luminaires requires a laboratory has the following test procedures on their scope of accreditation:

- IES LM-31-1995 and/or LM-31-2011
- IES LM-46-2004

# Laboratory Recognition for HID Ballasts



Recognition for testing HID ballasts for inclusion on the Certified Lighting Subcomponent Database (CSD) requires a laboratory has the following test procedures on their scope of accreditation:

- ANSI C78.389-2004
- ANSI C82.6-2005

# Laboratory Recognition for HID Lamps



Recognition for testing HID ballasts for inclusion on the Certified Lighting Subcomponent Database (CSD) requires a laboratory has the following test procedures on their scope of accreditation:

- CIE Publication No. 13.3 – 1995
- IES LM-47-2001 and/or LM-47-2011
- IES LM-51-2000

# Luminaires: Solid State Test reports required for certification



Product certification for non-directional solid state luminaires requires test reports from an EPA recognized lab for all of the following test procedures or listing on the CSD:

- ANSI C78.377-2008
- ANSI C82.77-2002
- CIE Publication No. 13.3 – 1995
- IES LM-79-2008
- IES LM-82-2011 (if LED light engine is used)
- IES TM-21-2011 (when published)

Product certification of a directional luminaire requires additional test reports from an EPA recognized lab for the following test procedures:

- IES LM-79-2008, Section 10
- IES LM-58-1994 and/or LM-58-2011

# Luminaires: Solid State



- EPA will not be recognizing laboratories for solid state non-directional until LM-82 is published.
- EPA will be recognizing laboratories for directional SSL (using LM-79), but products can only be qualified using lumen maintenance option 2 (6000h luminaire testing) until TM-21 is published.

# SSL Test Procedures

Requirement Category	Luminaire-Specific Test or CSD	Test Procedures		
Efficacy, output, zonal lumen distribution, Color angular uniformity, Luminaire photometry	Luminaire-specific Test	IES	LM-79 section 10	Electrical and Photometric Measurements of Solid-State Lighting Products (Goniophotometer)
Color angular uniformity	Luminaire-specific Test	IES	<a href="#">LM-58-94</a> and/or <a href="#">LM-58-11</a>	Guide to Spectroradiometric Measurements
CCT	Both	ANSI	<a href="#">C78.377-2008</a>	Specifications for the Chromaticity of Solid State Lighting Products
PF	Both	ANSI	<a href="#">C82.77-2002</a>	Harmonic Emission Limits—Related Power Quality Requirements for Lighting Equipment
CRI	Both	CIE	<a href="#">Pub. No. 13.3-1995</a>	Method of Measuring and Specifying Color Rendering of Light Sources
Efficacy, output, Lumen Maintenance, CCT, CRI, Color maintenance	Both	IES	<a href="#">LM-79-08</a>	Electrical and Photometric Measurements of Solid-State Lighting Products
Light Source Life, Lumen Maintenance, Color maintenance	Both	IES	<a href="#">LM-80-08</a>	Measuring Lumen Maintenance of LED Light Sources
Light Source Life, Lumen Maintenance	Both	IES	TM-21-11	Projecting Long Term Lumen Maintenance of LED Packages (in draft 12/2010)
Efficacy, output, Lumen Maintenance, CCT, CRI, Color maintenance, Light source life	Both	IES	LM-82-11	Characterization of LED light engines and Integrated LED Lamps for electrical and Photometric properties as a function of temperature

# Laboratory Recognition for Solid State (Non-directional)



Recognition to test non-directional solid state luminaires and subcomponents for inclusion in the CSD requires a laboratory has the following test procedures on their scope of accreditation:

- ANSI C78.377-2008
- ANSI C82.77-2002
- CIE Publication No. 13.3 – 1995
- IES LM-79-2008 (excluding section 10)
- IES LM-82-2011 (when published)
- IES TM-21-2011 (when published)

# Laboratory Recognition for Solid State (Directional)



Recognition for directional solid state luminaires requires a laboratory has the following test procedures on their scope of accreditation:

- ANSI C78.377-2008
- ANSI C82.77-2002
- CIE Publication No. 13.3 – 1995
- IES LM-58-1994 and/or LM-58-2011
- IES LM-79-2008 (including sections 9, 10 12)
- IES TM-21-2011 (when published)

# Luminaires: Halogen – Outdoor Only

## Test reports required for certification

---



Product certification for non-directional halogen luminaires and subcomponents requires reports from an EPA-Recognized laboratory for the following tests:

- IES LM-49-2001 and/or LM-49-2011
- Motion sensing and photo sensing measurements to confirm that product meets Luminaire specification requirements.

To test directional luminaires, all of the above plus:

- Zonal Lumen Density report

# Laboratory Recognition for Halogen (Non-Directional)



EPA recognition for testing non-directional halogen luminaires and subcomponents requires accreditation to the following test procedure:

- IES LM-49-2001 and/or LM-49-2011

In addition:

- Submission of laboratory's internal test procedure for motion sensing and photo sensing that demonstrates ability to competently test these fixtures

# Laboratory Recognition for Halogen (Directional)



EPA recognition for testing directional halogen luminaires requires accreditation to all of the following test procedure:

- IES LM-49-2001 and/or LM-49-2011

In addition:

- Submission of laboratory's internal test procedure for motion sensing and photo sensing that demonstrates ability to competently test these fixtures
- Evidence that a laboratory is equipped with a goniophotometer and accredited to either IES LM-79 section 10, IES LM-31-1991 and/or LM-31-2011, IES LM-46-2004, IES LM-10-1996 and/or LM-10-2011 or IES LM-41-1998 and/or LM-41-2011 to demonstrate competency to carry out luminaire photometry

# Other Reference Standards



EPA recognized laboratory may also evaluate and provide documentation to CBs for the following standards:

- ANSI/ANSLG C78.42-2009
- ANSI/ANSLG C78.43-2007
- ANSI/ANSLG C78.81-2010
- ANSI/IEC C78.901-2005
- ANSI/ANSLG C81.61-2009
- ANSI/ANSLG C81.62-2009
- ANSI/ANSLG C82.14-2006
- ANSI C82.4-2002
- ASTM E283-04
- IEC 60061-1
- IEC 60081 Amend 4 Ed 5.0
- IEC 60901
- IEC 61347-2-3-am2 ed1.0 b.2006
- IEC 62321 Ed. 1.0
- NEMA LSD 45-2009
- NEMA LL 9-2009
- CAN/CSA C22.2 NO. 74-96 (R2010) \*

\* Must be accredited by the Standards Council of Canada

# Electrical Safety Requirements



The following electrical safety tests must be carried out by an OSHA Nationally Recognized Testing Laboratory (NRTL):

- ANSI/IEEE C62.41-2002 (Transient Protection)
- ANSI/UL 153-2002
- ANSI/UL 935-2009
- ANSI/UL 1029-2010
- ANSI/UL 1310-2010
- ANSI/UL 1574-2004
- ANSI/UL 1598-2008
- ANSI/UL 1598B-2010
- ANSI/UL 1993-2009
- ANSI/UL 2108-2004
- ANSI/UL 8750-2009\*

\*Until OSHA adds ANSI/UL 8750 to their offerings, a test report for this test method from an OSHA NRTL without UL 8750-2009 on their scope of accreditation will be acceptable

# EMI Requirements



Electromagnetic interference testing must be carried out by an FCC-listed laboratory:

- FCC CFR Title 47 Part 15
- FCC CFR Title 47 Part 18

<https://fjallfoss.fcc.gov/oetcf/eas/reports/TestFirmSearch.cfm>



# Steps to Participate

# Steps to Participate



1. Review partner commitments and product specifications to determine eligibility.
2. Apply for partnership.
  - a) Manufacturers & private label brand owners new to ENERGY STAR must apply for partnership by completing the partnership application.
3. Select an EPA recognized certification body.
  - a) Submit products to an EPA recognized test lab.
  - b) Lab submits test results to an EPA recognized certification body.
  - c) CB certifies product(s).
4. Qualify a product and adhere to partner commitments.
5. Participate in verification testing.

# Step 1: Review Product Specifications to Determine Eligibility



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Partner Resources Home > Partner Resources > Manufacturers > Resources for Lighting Equipment Manufacturers and Retailers

**Manufacturers**

Resources for Lighting Equipment Manufacturers and Retailers

**Menu**

- Light Bulbs (CFLs)
- Residential Light Fixtures
- Solid State Light Fixtures
- Integral LED Lamps
- Decorative Light Strings
- Advanced Lighting Package Sales and Marketing Materials
- ENERGY STAR Training Center
- ENERGY STAR Logos
- Campaigns
- Case Studies
- Other

**General and Program Resources**

- [ENERGY STAR Partner Meeting](#)
- [2010 ENERGY STAR Summary of Lighting Programs](#) (1.2MB)

**Lighting Categories**

**Light Bulbs (CFLs)**

- [Compact Fluorescent Light Bulbs Program Requirements and Product Specifications](#) (419KB)
- [Choose A Light Guide](#)
- [Compact Fluorescent Light Bulbs Manufacturer List](#)

**Residential Light Fixtures**

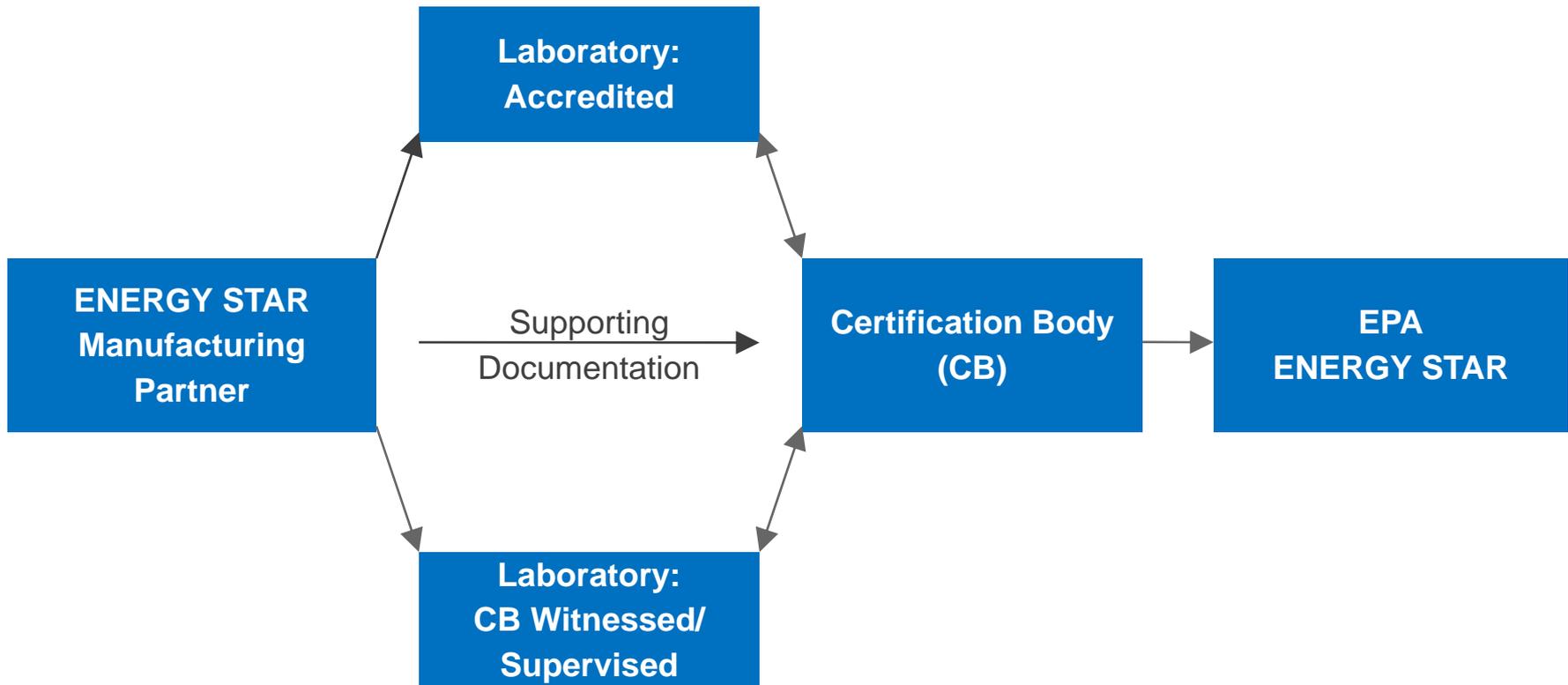
- Review product specifications at [www.energystar.gov/lightingresources](http://www.energystar.gov/lightingresources)
- Luminaires specification [www.energystar.gov/luminaires](http://www.energystar.gov/luminaires)

# Step 2: Apply for Partnership



- Manufacturers new to ENERGY STAR can apply at [www.energystar.gov/join](http://www.energystar.gov/join)
- Parties interested in the luminaires program (not already receiving updates) can email [Luminaires@energystar.gov](mailto:Luminaires@energystar.gov)

# ENERGY STAR Qualification Process



# Step 3: Select an EPA-Recognized Certification Body



Lighting	
Decorative Light Strings	Advanced Compliance Solutions, Inc., Bureau Veritas, CSA International, Intertek, Keystone Certifications, TUV SUD America, Inc., UL
Lamps	Advanced Compliance Solutions, Inc., Bureau Veritas, CSA International, Intertek, Keystone Certifications, TUV SUD America, Inc., UL
Luminaires	Advanced Compliance Solutions, Inc., Bureau Veritas, CSA International, IAPMO R&T, Intertek, Keystone Certifications, TUV SUD America, Inc., UL

[www.energystar.gov/3rdpartycert](http://www.energystar.gov/3rdpartycert)

# Step 3: Select an EPA-Recognized Lighting Lab



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**ENERGY STAR** Products Home Improvement New Homes Buildings & Plants Partner Resources

Home > Partner Resources > Third-Party Certification

### Third-Party Certification

The ENERGY STAR program has grown to encompass more than 60 product categories and is used by millions of Americans to identify products that reduce energy costs and protect the environment. To ensure that ENERGY STAR remains a trusted symbol for environmental protection and superior energy efficiency, all ENERGY STAR product partners will be required to follow a new set of Third-Party Certification procedures starting January 1, 2011. To ensure a smooth transition to these new procedures, EPA has provided the following resources:

#### Resources for Partners, Accreditation Bodies, Certification Bodies, and Laboratories

**Current** Archived

- Final ENERGY STAR Partner Commitments and Product Specifications
- Third-Party Certification Process Flow Diagram (110KB)
- Frequently Asked Questions

#### Third-Party Certification Resources

ENTITY	RESOURCE		
	Program Requirements	How To Participate	Current Participants
Accreditation Bodies	Conditions and Criteria for Recognition of Accreditation Bodies for ENERGY STAR Laboratory Accreditation (41KB)	Application for EPA Recognition of an Accreditation Body (132KB)	EPA-Recognized Accreditation Bodies
Certification Bodies	Conditions and Criteria for Recognition of Certification Bodies for the ENERGY STAR program (60KB) ENERGY STAR Resources for EPA-Recognized Certification Bodies	Application for EPA Recognition of a Certification Body (234KB)	EPA-Recognized Certification Bodies
Laboratories	Conditions and Criteria for Recognition of Laboratories for the ENERGY STAR program (32KB) Required Test Methods for EPA-Recognized Laboratories (192KB) Guide to Lab Recognition by Lighting Category (67KB)	Application for EPA Recognition of a Laboratory (367KB)	EPA-Recognized Laboratories <b>EPA-Recognized Lighting Laboratories</b>

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Home > News and Announcements > EPA-Recognized Laboratories > EPA-Recognized Lighting Laboratories

### EPA-Recognized Lighting Laboratories

This page contains an updated list of EPA-Recognized Lighting Laboratories. Please refer to the primary [list of EPA-Recognized Laboratories](#) to find a lab that tests electronics, appliances, commercial food service, HVAC, or other products.

NOTES:

- Only accredited laboratories are listed on this page. Laboratories that are EPA-recognized through enrolling in a Certification Body's WMTLor SMTL program are not listed here.
- Manufacturers must conform with an EPA-recognized Certification Body (CB) which labs are appropriate for conducting testing depending on the product type and the specific nature of the CB's Program. A list of EPA-recognized laboratories is provided below.
- Windows, Doors, and Skylights partners are advised to contact the National Fenestration Rating Council ([www.nfrc.org](http://www.nfrc.org)) for a complete list of EPA-recognized laboratories for these products.
- The links below will take you to websites external to the energystar.gov domain. [EXIT](#)

#### EPA-recognized Lighting Laboratories by Product Category

Product Categories	EPA-recognized Laboratories (Laboratory Name, Location(s), Organization ID)
	<b>Luminaires</b>
Solid State Lighting Luminaires	<a href="#">BEST Test Service (Shenzhen) Co., Ltd.</a> (China) (1105851) <a href="#">Centre Testing International (China)</a> (1105365) <a href="#">CSA International (GA)</a> (1106008) <a href="#">GE Nela Park, Product Testing (OH)</a> (1st Party) (1105375) <a href="#">Independent Testing Laboratories, Inc.</a> (CO) (1100225) <a href="#">Intertek (NY)</a> (80150) <a href="#">Korea Institute of Lighting Technology (KILT)</a> (South Korea) (1106992) <a href="#">Luminaire Testing Laboratory (UL)</a> (PA) (1106125) <a href="#">Metrology &amp; Analytics Services Osram Sylvania Inc.</a> (MA) (1st Party) (1105433) <a href="#">UL Verification Services (Guangzhou) Co., Ltd.</a> (China) (1105834) <a href="#">Spectralux (Canada)</a> (1105820)
Residential Light Fixtures (Outdoor)	<a href="#">Aurora International Testing Laboratory (OH)</a> (1st Party) (1100260) <a href="#">Bay Area Compliance Laboratories Corp.</a> (China) (1105318)

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

# Step 3: Select an EPA-Recognized Lighting Lab



- Specific requirements for recognition will be detailed in the updated Guideline for Laboratory Recognition, which will be online soon at: [www.energystar.gov/3rdpartycert](http://www.energystar.gov/3rdpartycert)

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### Third-Party Certification

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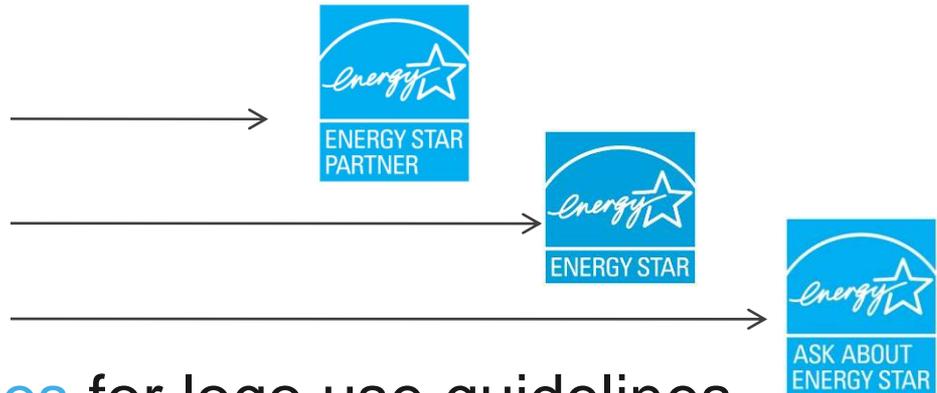
# Step 4: Qualify a Product and Adhere to Partner Commitments



- Receive confirmation of certification from CB
- Adhere to ENERGY STAR identity guidelines in addition to other partner commitments.

## – Types of logos

- Partnership mark
- Certification mark
- Promotional mark



Visit [energystar.gov/logos](http://energystar.gov/logos) for logo use guidelines.

**Always ensure logos are downloaded from EPA.**

# Qualified Product Lists

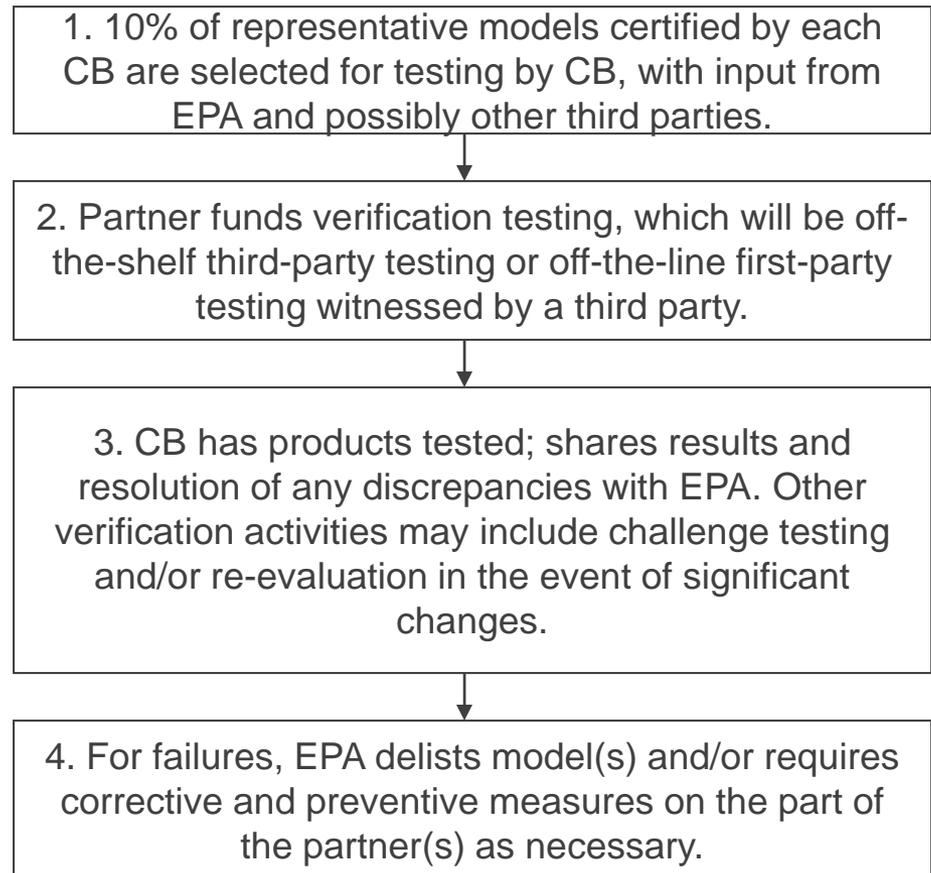


- New Luminaires qualified product list (QPL) will be found at [www.energystar.gov/lightfixtures](http://www.energystar.gov/lightfixtures) (not yet active)
  - As soon as laboratories are recognized for Luminaires specification (no laboratories are currently recognized) products can be certified and listed on the Luminaires QPL.
  - SSL certification of directional fixtures using IES LM-80 data not possible until IES TM-21 is published.
  - SSL non-directional certification is not possible until IES LM-82 is published.
  - Currently qualified RLF or SSL products will not be automatically rolled over to the Luminaires QP list.
- The current Residential Light Fixture and Solid State Lighting Qualified Products Lists will remain posted until September 30, 2011.

# Step 5: Participate in Verification Testing



- Verification testing ensures products continue to meet ENERGY STAR requirements.
- New policies forthcoming.



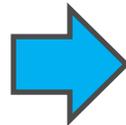
# Step 5: Participate in Verification Testing



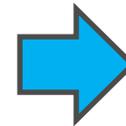
- 10% minimum of all product qualified per CB.
  - Products derived from representative models are subject to verification testing , but no more than one product per family would be tested per year.



**35 total fixtures qualified by CB**



**10 unique model numbers**



10% of 10 unique model numbers = minimum of 1 fixture to be tested for verification

# Timeline



January 1, 2011:

Third Party  
Certification  
goes into effect  
for all products

March 31, 2011:

Certified  
Lighting  
Subcomponent  
Database live

October 1, 2011:

Luminaires V1.0  
Effective date  
SSL & RLF  
qualified product  
lists discontinued

February 16, 2011:  
Luminaires V1.0  
Final

June 15, 2011:  
Products may  
only be certified  
to Luminaires  
V1.0  
GU24 Lamps no  
longer qualified

# Timeline



- Once laboratories are recognized for the new Luminaires categories, CBs may begin certifying products to the Luminaires specification.
- Products can be qualified to the existing SSL Luminaires V1.3 (SSL) or Residential Light Fixtures V4.2 (RLF) specifications until **June 15, 2011**.
- GU24 lamps are currently qualified under RLF 4.2, and GU24 lamps can no longer be qualified after **June 15, 2011**.
- The RLF or SSL qualified product lists will not be maintained after **October 1, 2011**.
- Products qualified under the old specifications will NOT be grandfathered into the new program, and partners must cease ENERGY STAR labeling of these products by **October 1, 2011**.
- Today's webinar will be posted on the Luminaires page:

# Thank You! Questions?



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

[www.energystar.gov/3rdpartycert](http://www.energystar.gov/3rdpartycert)

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

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