



# **ENERGY STAR®**

## **Luminaires Specification**

### **Training for EPA Recognized CBs & Labs**

**Alex Baker**  
**Lighting Program Manager, ENERGY STAR**

**Kathleen Vokes**  
**Program Integrity, ENERGY STAR**

**April 26, 2011**



Learn more at [energystar.gov](http://energystar.gov)

# Agenda

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- ENERGY STAR Luminaires Overview
  - Specification Scope
  - Determining Directional/Non-directional Products
  - Laboratory Recognition & Using the Certified Subcomponent Database (CSD)
- Third Party Certification Process
  - Eligibility
  - Laboratory Test Reports
  - Reviewing Applications: Common Problems
  - Certification
  - Data Submission Forms
  - Qualified Product List
  - Verification Testing
- Timeline
- Questions
- Other Helpful Information (Appendix)



# **ENERGY STAR Luminaires Overview**

# Overview: ENERGY STAR Luminaires



Residential Light Fixtures (RLF)

Solid State Lighting Luminaires (SSL)

## Luminaires V1.0

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

- Goal: A technology-neutral specification
- Residential focus with a few directional commercial fixtures
- Efficiency levels & testing depend on product classification
- Substantial savings, e.g. products will be about 4-5 times more efficient than conventional lighting
- 3 year warranty covering fixture & bulbs



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# **Specification Scope:**

## Which fixtures can be qualified?

# Overview: Technologies In the Scope of the Specification



- Fluorescent

- LED



- HID



- Halogen  
(outdoor with photo sensor only)



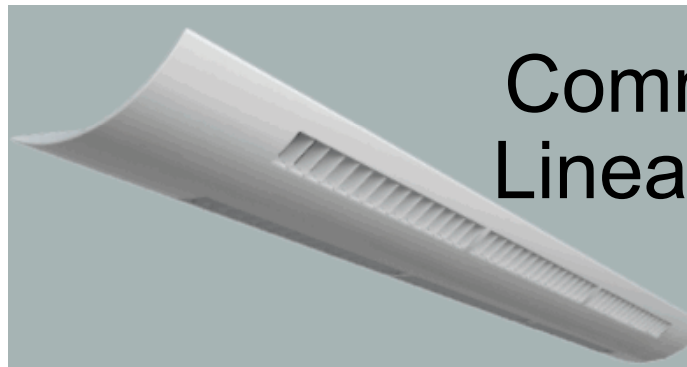
# Overview: Base types



- Bi-Pin: e.g., Fluorescent
- GU24: Compact Fluorescent LED Integrated Lamp
- Non-ANSI base: LED Light Engine
- E26 e.g., HID or Halogen (outdoor only)



# What is NOT covered?



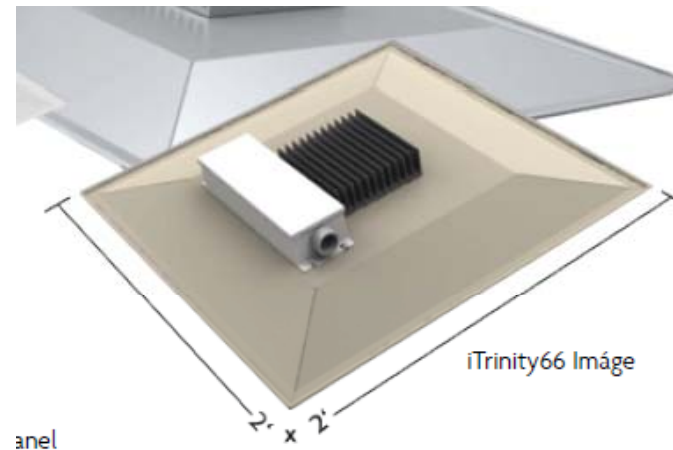
Commercial  
Linear Forms



Hi-Bays or Garage Lights



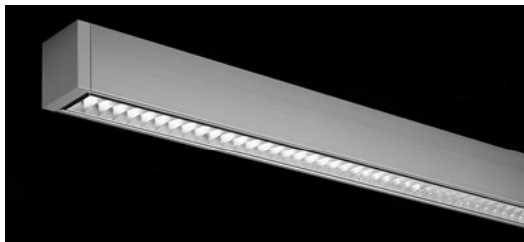
Troffers





# Quiz:

## ENERGY STAR Luminaire or not?



- A. Chandelier – CFL
- B. Linear Fluorescent Pendant
- C. Under Cabinet: Fluorescent
- D. Recessed downlight – LED
- E. Pendant – LED
- F. Outdoor Pole Mount

# Quiz:

## ENERGY STAR Luminaire or not?



- A. Chandelier – CFL
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- C. Under Cabinet: Fluorescent
- D. Recessed downlight – LED
- E. Pendant – LED
- F. Outdoor Pole Mount

# Quiz:

## ENERGY STAR Luminaire or not?



- A. Ceiling fan – CFL
- B. Ceiling Fan – LED Light Engine
- C. Vent Fan – CFL
- D. Vent Fan – Halogen



# Quiz: ENERGY STAR Luminaire or not?



- A. Ceiling fan – CFL
- B. Ceiling Fan – LED Light Engine
- C. Vent Fan – CFL
- D. Vent Fan – Halogen





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# Determining Directional/Non-Directional

# Fixture Categorization: Industry Background




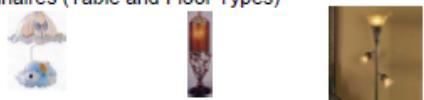





NEMA / ALA white paper:  
classified products as Decorative (D) or Functional (F), but many classified as Both (B).

**Subjective classification is ineffective for ENERGY STAR**

NEMA/ALA Roundtable: came to consensus on testing

- **Visible source:** test with luminaire photometry
- **Obscured source:** test with source photometry

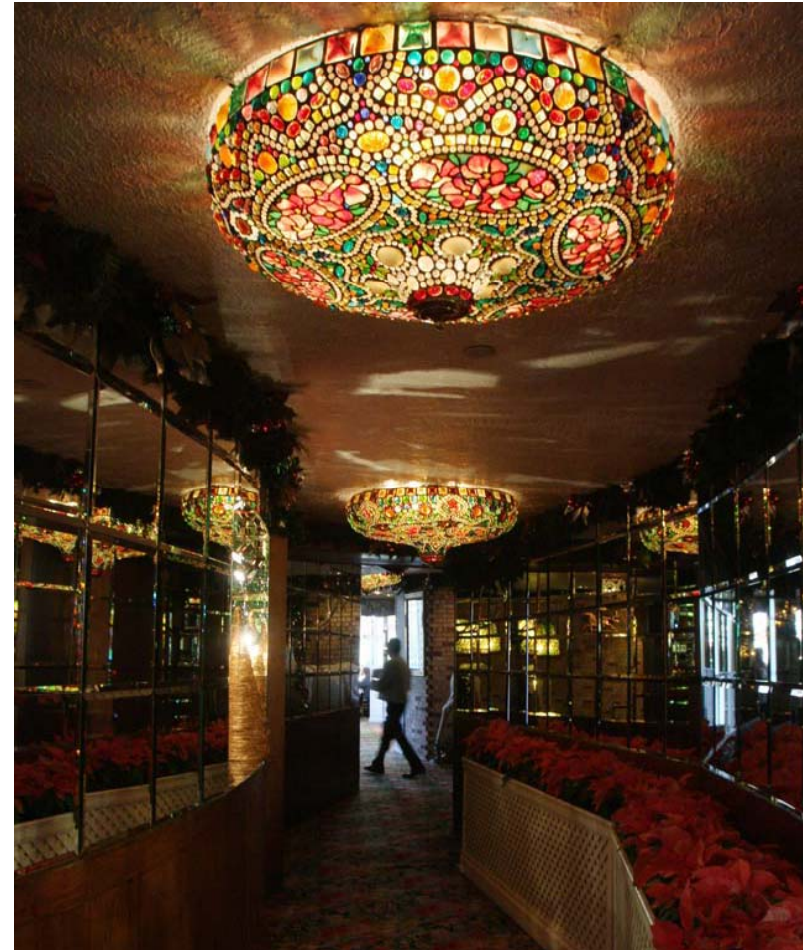
Luminaire Description or Style			Type
Chandeliers 			B
Recessed Down-Lights 			F
Wall Sconces 			D
Surface Mount 			B
Hanging Pendants 			B
Portable Luminaires (Table and Floor Types) 			B
Track 			F
Task 			F
Accent 			D



# Quiz: How Would You Categorize This Fixture?



- It is the only light in the hallway
- It is highly decorative
- Does it provide functional illumination?



# Luminaire Categorization



**ENERGY STAR Luminaires V1.0 spec adopts directional & non-directional categories.**

- **Directional:** test the fixture with luminaire photometry, measuring lumens emitted from the fixture per input watt
- **Non-directional:** test the “bulb” with source photometry, measuring lumens emitted from the bulb per input watt



# Luminaire Categorization



1. Determine if the fixture is within the specific directional scope (minimum light output & distribution requirements are applied).
2. If a product does not fall into the directional scope it defaults to non-directional categorization

**Exception:** if an SSL source in a non-directional fixture is not replaceable/upgradeable, it must meet the “inseparable SSL luminaire” requirements detailed in directional requirements.



# Directional Luminaires



## Residential Grade Indoor:

- accent lights (includes line-voltage directional track lights & directional ceiling fan light kits)
- cove mounts
- downlights: recessed, pendant, surface mount (includes retrofits, IC, type Non-IC, AT and non-AT recessed downlights)
- outdoor post-mounted luminaires
- under cabinet luminaires
- inseparable SSL luminaires not included above

## Commercial Grade

- Commercial accent lights including line-voltage directional track lights
- Commercial downlights: recessed, pendant, surface mount (includes SSL downlight retrofits & excludes troffers or linear forms)
- Commercial under cabinet shelf-mounted task lighting
- Commercial portable desk task lights



# Non-directional Examples

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## Residential Grade Indoor:

- bath vanity
- ceiling and close-to-ceiling mount
  - non-directional ceiling fan light kits
- chandeliers
- decorative pendants
- linear strips
- wall sconces
- wrapped lens
- ventilation fan lights
- portable luminaires
  - portable desk task lights
  - portable floor task lights
  - “table lamps” and “floor lamps”
  - torchieres

## Residential Grade Outdoor

- ceiling and close-to-ceiling mount
- porch (wall-mounted)
- pendant
- security

# Directional vs. Non Directional Fan Kits



- Directional Light kits: Light is constrained and creates defined beams of light.
- Non-Directional Fan kits: light goes everywhere



# Vent Fans with Lighting



- Vent fans are typically considered Non-directional luminaires because the light distribution is very wide. Therefore, test the light source (bulb) not the delivered light.



# Quiz:

## Directional or Non-Directional?



A. CFL chandelier



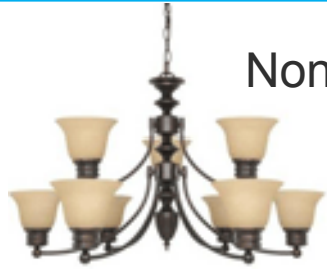
B. LED under cabinet



C. LED recessed downlight

# Quiz:

## Directional or Non-Directional?



Non-directional

Directional



Directional

A. CFL chandelier

B. LED under cabinet

C. LED recessed downlight

# Quiz:

## Directional or Non-Directional?



Vent Fan



- A. Vent Fan
- B. Ceiling fan 1
- C. Ceiling Fan 2
- D. Ceiling Fan 3



Ceiling Fan 1



Ceiling Fan 2



Ceiling Fan 3





# Quiz:

## Directional or Non-Directional?



Non-directional



- A. Vent Fan
- B. Ceiling fan 1
- C. Ceiling Fan 2
- D. Ceiling Fan 3



Non-Directional



Directional

Non-directional



# Measurement: Two Approaches



- **Source efficacy:** Measure the light source in an integrating sphere & compare total light output of the source against the total input wattage.
- **Luminaire efficacy:** Measure the entire fixture & compare total delivered lumens of the fixture against the total input wattage. Use Goniophotometer to measure angles of light distribution.



# Luminaire vs. Source Measurement: One Size Does Not Fit All



## Luminaire efficacy:

- Suitable for measuring white light fixtures
- Necessary for measuring fixtures where the light source cannot be removed to be measured separately
- Not very useful for measuring fixtures with highly decorative optics or finishes
- Popular decorative glass fixtures with high-quality, efficient light sources would have odd test results

## Source efficacy:

- Suitable for measuring fixtures with removal light sources (bulbs & LED light engines)
- Establishes clear efficiency and color performance of the source regardless of the fixture style
- Useful when the entire light source can be tested on its own



# Luminaire Photometry on Decorative Fixtures



Product Description	Input Power (W)	Luminous Flux (lm)	Luminous Efficacy (lm/W)	CCT	CRI
White shade	4.48	165.0	36.83	3761	73.6
Blue shade	4.48	129.9	28.99	4998	72.0
Amber Shade	4.48	82.6	18.44	2851	69.0
Decorated glass	4.48	34.9	7.78	2711	78.1

- Luminaire photometry conducted
- All have the same exact efficient light source
- Only difference is the shade
- Very different results

# Quiz:

## Luminaire or Source photometry?



- A. Chandelier
- B. Under cabinet
- C. Recessed downlight
- D. Pendant
- E. Outdoor porch



# Quiz: Luminaire or Source photometry?



Source



Source



- A. Chandelier
- B. Under cabinet
- C. Recessed downlight
- D. Pendant
- E. Outdoor porch



Luminaire



Luminaire



Source

# Quiz: Luminaire or Source Photometry?



Vent Fan



- A. Vent Fan
- B. Ceiling fan 1
- C. Ceiling Fan 2
- D. Ceiling Fan 3

Ceiling Fan 1



Ceiling Fan 2



Ceiling Fan 3





# Quiz: Luminaire or Source Photometry?



Source



- A. Vent Fan
- B. Ceiling fan 1
- C. Ceiling Fan 2
- D. Ceiling Fan 3

Source/Luminaire



Luminaire



Source

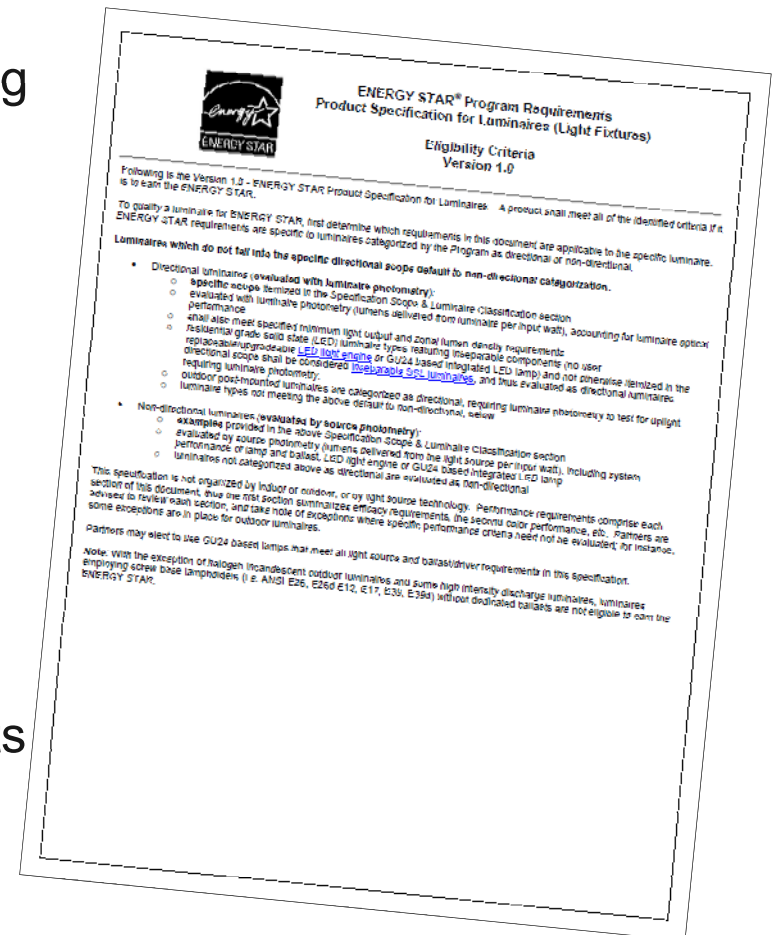




# Specification Summary: ENERGY STAR Luminaires V1.0



- **Directional** fixtures and fixtures with inseparable light sources will be tested using luminaire photometry (already required in SSL spec)
- **Non-directional** fixtures with replaceable light sources will be tested using source photometry (already required in RLF spec)
- 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



# Specification: Directional Luminaires



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

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

# Specification: Non-Directional Luminaires



- Evaluated with source photometry: source lumens/input watt and do not include measurement of luminaire optical losses
    - 65 lm/W in 2011
    - Increases to 70 lm/W beginning September 1, 2013
  - Non-directional fixtures are not intended to illuminate specific surfaces
- 
- Includes minimum source light output requirements
    - 800 lumens or 450 lumens per head
  - 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

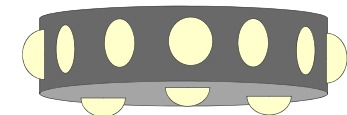
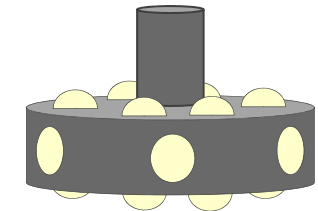
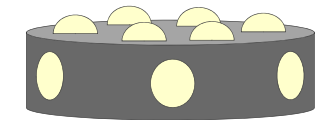


# Specification: LED Light Engines



## 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)



**Definition is identical to an Integrated LED Lamp (LED light bulb), except for the ANSI base.**

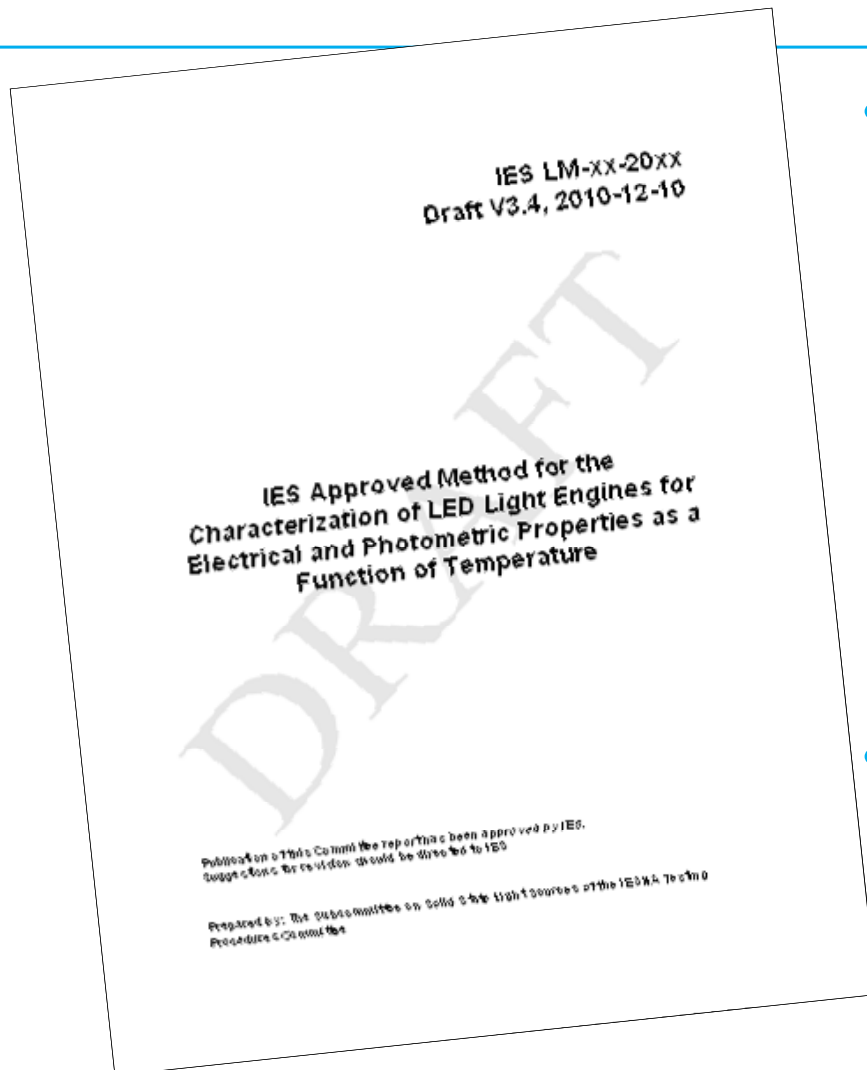
# Specification: LED Light Engines

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- Two ways to consider 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 should also be testable per IES LM-82

# Specification: New Test Procedure



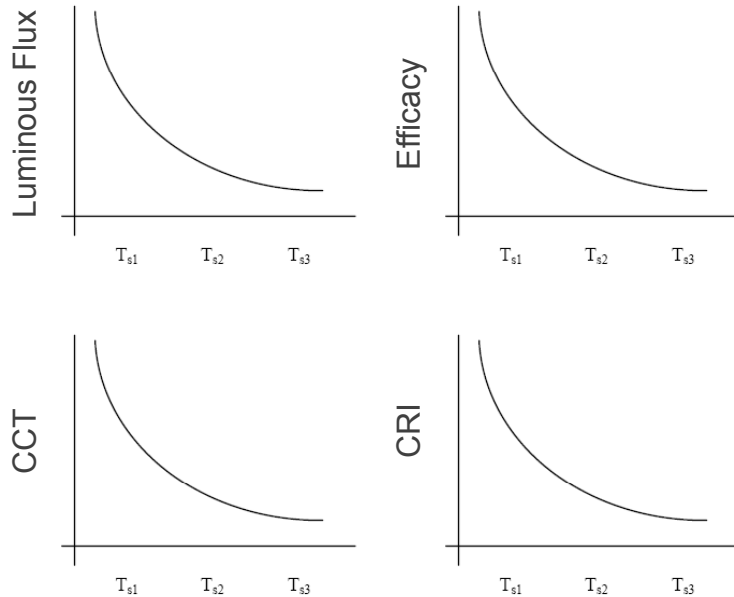
- IES LM-82-11: Approved Method for the Characterization of LED Light Engines and Integrated LED Lamps for Electrical and Photometric Properties as a Function of Temperature
- IES LM-82 is not yet final but is required to test and certify non-directional fixtures using LED light engines or GU24 integrated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

# LED Light Engine Testing: IES LM-82-11



- 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

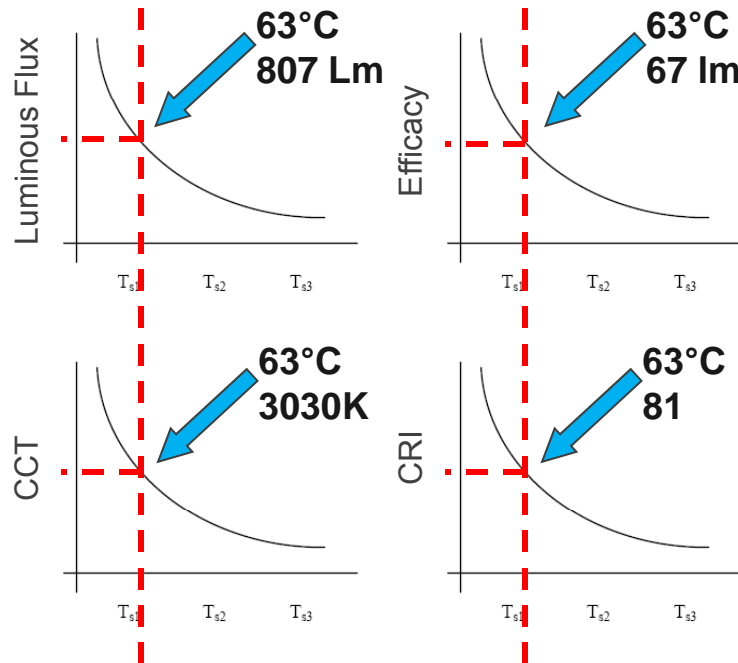
# LED Light Engine Testing



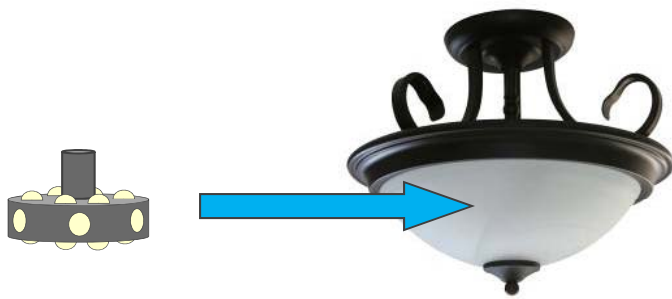
- LM-82 generates performance curves for the LED light engine, example:
  - X axis is temperature
  - Y axis is performance
- As temperature goes up, performance declines
- LM-82 test report captures this performance degradation



# LED Light Engine Testing



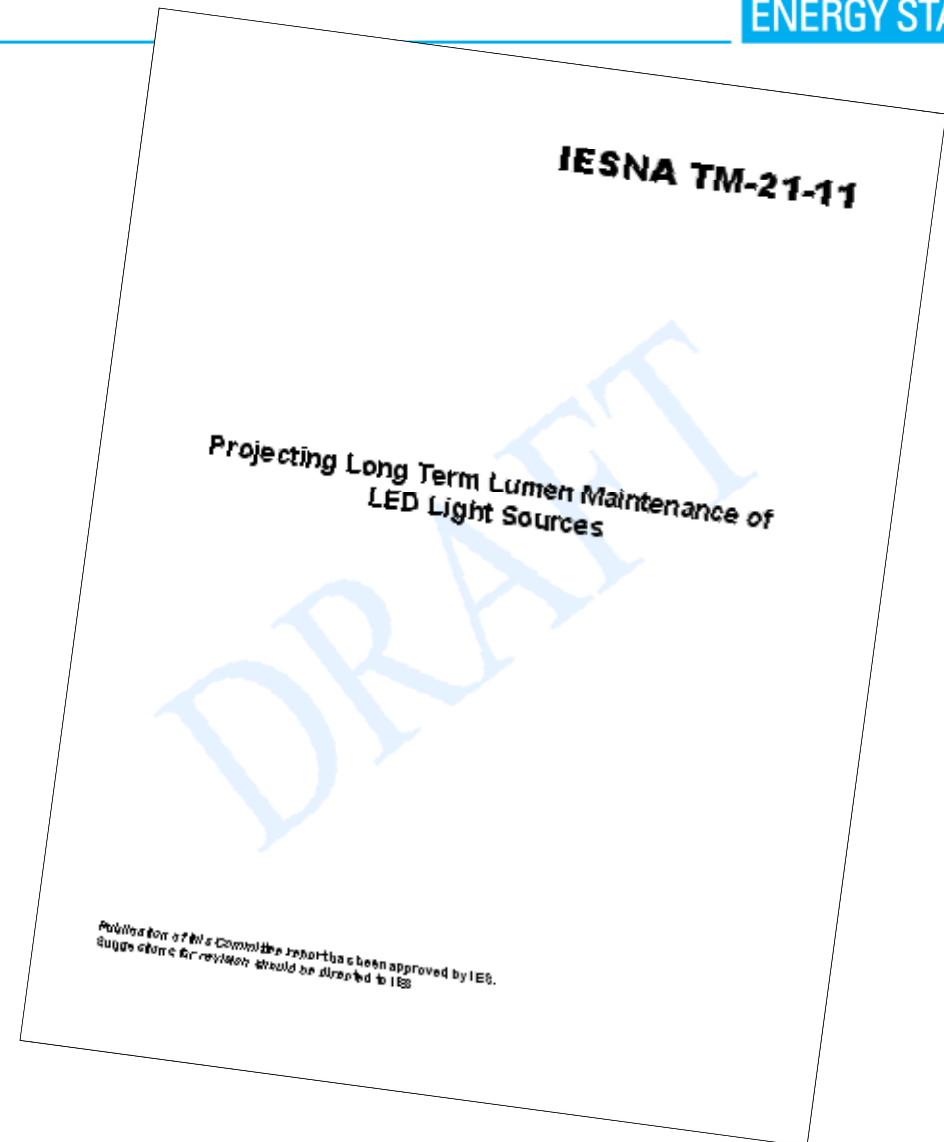
- With an LM-82 test report, performance of the LED light engine in a fixture can be determined with a temperature measurement
- Example: in this fixture, the LED light engine's temperature is 63°C
- The LM-82 test report for the LED light engine shows us flux, efficacy, and color performance at 63°C



# 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.

# 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.

# Luminaires Laboratory Recognition



## Luminaire Category

- Fluorescent Non-Directional
- Fluorescent Directional
- HID Non-Directional
- HID Directional
- SSL Non-Directional
- SSL Directional
- Halogen Non-Directional
- Halogen Directional

## Components (CSD)

- LEDs (Package, Module or Array) IES LM-80-2008
- Fluorescent Ballasts
- Fluorescent Lamps
- HID Ballasts
- HID Lamps
- LED Light Engines
- GU24-based Integrated LED Lamps

# Certified Lighting Subcomponent Database (CSD)



- CSD: online tool to make qualifying Luminaires faster, less expensive
- Non-directional Luminaires use the photometric data from the light source or platform.
- The CSD lists test data of Light sources and platforms and Luminaire applications can reference products that are listed on the CSD.

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

# Certified Lighting Subcomponent Database (CSD)



- CSD currently available at [www.energystar.gov/lightingsubcomponents](http://www.energystar.gov/lightingsubcomponents)
- CSD Data submission forms are available at CB tools
- Includes third-party certified performance data:
  - Lamps: fluorescent, HID
  - Fluorescent, HID ballasts
  - 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)
- In consideration: LED package/array/module lumen maintenance data based on IES LM-80 tests and IES TM-21 projections.



# Certified Lighting Subcomponent Database (CSD)



	A	B	C	D	E	F	G	H	
	Platforms								
2	ENERGY STAR® Name of Field	Ballast Manufacturer Name	Ballast Manufacturer's EPA-issued Organization ID	Ballast: Is the Organization Listed the Original Equipment Manufacturer (OEM)?	Ballast: If the Organization is Not the Original Equipment Manufacturer, Who is?	Ballast Model Name	Ballast Model Number	Ballast Brand Name	Ballast Contact
3	Restrictive Input Options		MESA lookup	Yes, No					
4	Data Requirement	Required	Required	Required	Conditionally Required	Required	Required	Required	Require
5	Display on Matrix	Displayed	Not Displayed	Not Displayed	Not Displayed	Displayed	Displayed	Displayed	Not Disp
6	Submission 1								
7	Submission 2								
8	Submission 3								
9	Submission 4								
10	Submission 5								
11	Submission 6								
12	Submission 7								

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

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



# Third Party Certification Process for CBs



1. **Determine eligibility:** CB determines manufacturer eligibility, that product is within scope, and helps manufacturer choose test labs that are recognized for the appropriate tests/product type
2. **Receive Lab Reports:** CB receives test results directly from the laboratory
3. **Review:** CB reviews all submission materials, determines product eligibility and certifies the product(s)
4. **Certification:** CB provides certification in writing that the product meets the ENERGY STAR specification
5. **Certified Product Data:** CB completes data submission forms
6. **EPA Listing:** CB transmits data to EPA for qualified product list
7. **Verification testing:** CB performs off-the-shelf verification testing

# Step 1: Determine Eligibility

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- Standard Operating Procedure for Product Evaluation  
[www.energystar.gov/cbresources](http://www.energystar.gov/cbresources)

In addition:


- Do an Initial review: Information provided about the Luminaire from the manufacturer suggests that a product won't meet specification levels. (Efficacy too low, Color temperature too high etc)
- Product is not within the scope of the specification
- Product is marketed commercially but only covered under the residential scope

# Step 2: Receive Lab Reports





**ENERGY STAR**



**THE QUALITY OF OUR ENVIRONMENT IS EVERYONE'S RESPONSIBILITY**  
U.S. Environmental Protection Agency • U.S. Department of Energy

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## EPA-Recognized Lighting Laboratories

### EPA-recognized Lighting Laboratories by Product Category

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

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



# Step 2: Receive Lab Reports



- Specific requirements for recognition can be found in the updated Guideline for Laboratory Recognition, online at:  
[www.energystar.gov/3rdpartycert](http://www.energystar.gov/3rdpartycert)
- EPA recognizes lighting laboratories for photometric tests only, and test reports must come directly from a Laboratory recognized for a specific technology: Fluorescent, HID, SSL, Halogen
- Electrical safety testing must be carried out by an OSHA NRTL.
- EMI testing must be carried out by an FCC- recognized lab:  
<https://fjallfoss.fcc.gov/oetcf/eas/reports/TestFirmSearch.cfm>

# Step 3: Application Review

## Common Problems

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- Application is missing materials (CBs should develop checklists of required materials based on specification)
- Test reports must come directly from the laboratory, not from the manufacturer.
- Incomplete or unacceptable test reports: call the lab directly and sort out the problem.
- Warranty information is incomplete or does not meet the requirements
- Product packaging does not include all required information for product type
- Submission does not include a photo, diagram or sufficient information to verify proper eligibility
- Model number(s) on test report(s) do not match other submission materials
- Report shows product failures that were identified

# Step 3: Application Review: Common Problems with SSL

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- Power supply warranty doesn't include the maximum operating temperature under which the product is covered
- Inappropriate and/or incomplete LM-80 reports

## Step 3: Application Review: Common Problems with Fluorescent/HID

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- Outdoor fixtures do not contain integrated photosensors or motion sensors
- Fixture does not have a replaceable ballast or has incomplete information regarding the replacement of the ballast
- Packaging claims do not follow labeling requirements
- Packaging is missing model number or Correlated Color Temperature
- Packaging compares reflector or decorative wattage but does not provide side-by-side lumen comparison



# Step 3: Application Review: Ceiling & Vent Fans



- Product is evaluated in two parts and must be certified by both a CF/VF CB and a Lighting CB or a CB recognized to certify both Fans and Luminaires.
- Data submission forms will be provided for:
  1. Ceiling fans with no lighting
  2. Ceiling fan light kits (Luminaires form)
  3. Ceiling fans with inseparable lighting
  4. Vent fans with no lighting
  5. Vent fans with lighting

# Step 3: Application Review: Using the CSD

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- Find a light source or platform on the CSD
- Use CSD data to fill in the Luminaires data submission form
- Even though a product is on the CSD, a CB is still required to review data as a whole and make sure that a given CSD component in a fixture will meet the specification requirements.

## Step 4: Certification

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- ENERGY STAR Standard Operating Procedure for Product Evaluation at <http://www.energystar.gov/cbresources>
- CB provides written confirmation of certification to the manufacturer
- Manufacturer may label product after receiving this written confirmation

# Step 5: Certified Product Data Submission Forms



- All data submission forms can be found on the CB resources page [www.energystar.gov/cbresources](http://www.energystar.gov/cbresources)
- CB is responsible for the quality and formatting of these forms per the instructions included in the forms.
- Manufacturers may not fill out the forms for submission to the CB.
- All fields must be completed, including conditionally required fields where they apply to the product. If not applicable, “N/A” is an acceptable entry.
- Data entered into the data submission forms must come from the tested values and should reflect an average of the tested samples.
- Allowances for reported values to differ slightly from tested values; however all information must be based on test data.
- Packaging must reflect tested/reported values.

# Step 6: EPA Listing Luminaires Qualified Product List

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- Qualified product list available at [www.energystar.gov/lightfixtures](http://www.energystar.gov/lightfixtures)

# Step 7: Verification Testing

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- Verification testing may start as soon as the Luminaires specification is effective (10/1/11)
- CBs should work with EPA to determine appropriate test cycles
- EPA will be issuing additional guidance regarding verification testing for luminaires.

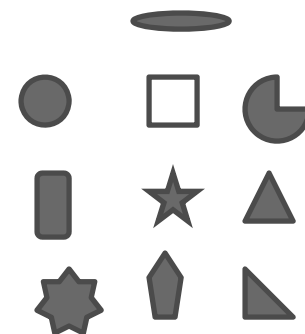
# Step 7: Verification Testing



- 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  
(including GU24  
lamps)

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



- CBs may begin certifying products to the Luminaires specification and will be able to submit information on certified products to EPA when forms are available.
- 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 be archived 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 manufactured by **October 1, 2011**

# What's Next? Lamps!

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- ENERGY STAR Lamps Specification Framework distributed March 22, 2011
- Will replace the existing CFL & LED specs
- Questions for discussion, requests for data
- 6 week comment period – please participate!

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

# Thank You! Questions?



Alex Baker  
EPA, ENERGY STAR  
Lighting Program Manager  
(202) 343-9272  
[baker.alex@epa.gov](mailto:baker.alex@epa.gov)

Kathleen Vokes  
EPA, ENERGY STAR  
Program Integrity  
(202) 343- 9019  
[vokes.kathleen@epa.gov](mailto:vokes.kathleen@epa.gov)

Taylor Jantz-Sell  
EPA, ENERGY STAR  
Lighting Marketing Manager  
(202) 343-9042  
[jantz-sell.taylor@epa.gov](mailto:jantz-sell.taylor@epa.gov)

Ku'uipo Curry  
ICF International  
Technical Specialist  
(202) 862-1559  
[kcurry@icfi.com](mailto:kcurry@icfi.com)

General questions: [luminaires@energystar.gov](mailto:luminaires@energystar.gov)

[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)



# Appendix

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- ENERGY STAR Logos
- Directional efficiency & minimum light output requirements
- Main changes for Fluorescent products
- Main changes for SSL products

# Only the certification mark indicates qualified product



- Manufacturers like many partners have access to ENERGY STAR logos

## — Types of logos:

- Partnership mark
- Certification mark
- Promotional mark



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

Always ensure model numbers appear on [energystar.gov](https://energystar.gov). Please report any logo violations to [logomisuse@energystar.gov](mailto:logomisuse@energystar.gov).

# Directional Efficacy & Light Output Requirements



Cove Mount	45	200 lm/ft
Downlights	42	345 or 575 (based on aperture $\geq 4.5"$ )
Accent lights	35	200 per head
Under cabinet	29	125 lm/ft
Outdoor Post-Mount	35	300
Commercial Portable Desk	29	200

# Main Changes for Fluorescent Products – Performance Criteria



Performance Criteria	RLF	Luminaires
Efficacy (non-directional)	≥50 lm/W (below 30W) and ≥60 lm/W (above 30W)	≥65 lm/W until Sept. 2, 2013 and ≥70 lm/W after
Efficacy (directional)		Varies by product type ranging from 29 – 45 lm/W
CCT	2700K, 3000K, 3500K, 4100K, 5000K or 6500K	2700K, 3000K, 3500K, 4100K, 5000K (commercial only)
Lamp Shipment	Required for all indoor except: linear and recessed downlights	Required for all luminaires except: linear, halogen outdoor and downlights with multi- wattage ballasts
Photosensor	Required for all outdoor fixtures	Not required
Warranty	2 years	3 years
Light output	None	800 lumens/fixture or 450 lumens/head (3 or more heads)

# Main changes for SSL products



Product Type	Eligible for SSL V1.3 (Luminaire efficacy only)	Eligible for Luminaires
Cove mount	Residential only 45 lm/w luminaire efficacy	No change
Under cabinet	24 lm/w Residential 29 lm/w Commercial luminaire efficacy	Residential & Commercial <b>29 Lm/W luminaire efficacy</b>
Down lights (retrofits, recessed, surface & pendant-mounted)	Residential & Commercial <b>35 lm/w luminaire efficacy</b>	Residential & Commercial <b>42 lm/w luminaire efficacy</b>
Accent lights a.k.a Surface mount with directional heads, Track heads etc.	Residential only 35 lm/w luminaire efficacy	Residential & <b>Commercial</b> 35 lm/w luminaire efficacy
Outdoor wall mounted porch lights, Ceiling-mounted luminaires with diffusers, Bollards and indoor wall wash luminaires	Various luminaire efficacy requirements from 24 – 35 lm/w	Inseparable light sources 70 lm/w luminaire efficacy, LED light engines 65 lm/w source efficacy
Portable desk lights	Residential & Commercial 29 lm/w luminaire efficacy	Residential & Commercial 29 lm/w luminaire efficacy
Outdoor pole/arm-mounted decorative luminaires	Residential only 35 lm/w luminaire efficacy	Residential only 35 lm/w luminaire efficacy
Misc product types covered under the scope	Proposed for 2011 at 70 lm/w luminaire efficacy	70 lm/w luminaire efficacy for inseparable luminaires 65 lm/w source efficacy for LED light engines



# Main changes for SSL products



Product Types Eligible for SSL V1.3 (Luminaire efficacy only)	Eligible for Luminaires
Outdoor wall mounted porch lights	Considered non-directional, must have a replaceable light source 65 lm/w light source efficacy (Inseparable light sources 70 lm/w luminaire efficacy)
Ceiling-mounted luminaires with diffusers	Considered non-directional, must have a replaceable light source 65 lm/w light source efficacy. (Inseparable light sources 70 lm/w luminaire efficacy)
Bollards	Not eligible
indoor wall wash luminaires	Not eligible
Outdoor Path Lights	Not eligible
Outdoor step lights	Not eligible