

LED Lighting Facts®

2014 Building Technologies Office Peer Review

The screenshot shows the LED Lighting Facts website interface. At the top, there is a search bar with the text "Search the LightingFacts.com site" and a "Registered User Login" dropdown. Below the search bar is the "LED lighting facts" logo, with "A Program of the U.S. DOE" underneath. The navigation menu includes "About", "Products", "EE Programs", "Partners", "Approved Labs", and "Library".

The main content area features a large heading "Success with solid-state lighting" and a sub-heading "Information For:". Below the heading is a paragraph: "The LED Lighting Facts- is a program of the U.S. Department of Energy that showcases LED products for general illumination from manufacturers who commit to testing products and reporting performance results according to industry standards." To the right of this text is a list of user groups with right-pointing arrows: "Manufacturers", "Retailers and Distributors", "Energy Efficiency Sponsors", "Approved Labs", "Lighting Pros", and "Consumers".

In the center, there is a detailed LED Lighting Facts label for a "Grand X" product. The label includes the following information:

- Light Output (Lumens): 840
- Watts: 9
- Lumens per Watt (Efficacy): 93
- Color Accuracy: Color Rendering Index (CRI): 87
- Light Color: Correlated Color Temperature (CCT): 2900 (Warm White)

The label also features a color spectrum diagram with markers for "Warm White", "Night White", and "Daylight", and a scale from 2700K to 6500K. At the bottom of the label, it states: "All results are according to IESNA LM-79-09. Approval based on the Certificate and Photometric Report of State State Lighting. The U.S. Department of Energy (DOE) verifies product wattage and results. Electrically measured or measured light output and the information listed on label test performance. Ratings may increase over time. Visit www.lightingfacts.com for the Label Reference Guide." Registration and model numbers are also provided.

At the bottom of the website screenshot, there is a prominent orange banner with the text "NOT A PARTNER? TAKE THE PLEDGE TODAY!" and a right-pointing arrow.

Project Summary

Timeline:

Start date: January 2009

Planned end date: September 2019

Key Milestones

1. Annual product list growth of 5,000 new products—14,842 products by 9/30/14
2. 200 verification tested products by 9/30/14

Budget:

Total DOE \$ to date: \$4.836 million

Total future DOE \$: \$3.717 million

Target Market/Audience:

SSL manufacturers, retailers, distributors, lighting designers, specifiers and energy efficiency programs.

Key Partners:

NGLIA	PG&E
NEMA	Efficiency Vermont
Grainger	Acuity Brands
Home Depot	Philips Lighting
Lowes	Cree Lighting

Project Goal:

To ensure accurate and consistent reporting of SSL product performance claims in a rapidly changing market—information essential to evaluating SSL products for market-specific applications.

Purpose and Objectives

Problem Statement: *The program was born out of need for independently measured and verified product performance widely available to product buyers and their agents.*

- Flood of new SSL products in market; many did not live up to their claims
- Concerns with low light output, non-credible reliability claims, poor or inconsistent color quality
- Risk of repeating mistakes with the early CFL “rush to market” -- slowed market acceptance

LED Lighting Facts was developed in coordination with industry to:

- Communicate accurate information about product performance
- Encourage continuous improvement of quality SSL products

Purpose and Objectives

Target Market and Audience: LED Lighting Facts is an industry tool used by manufacturers as a registry to report accurate performance about their products and widely-used as buyer's guidance by retailers, distributors, lighting specifiers and designers and energy efficiency programs. Not designed for consumers.

- Most LED manufacturers participate in the LED Lighting Facts program because:
 - They know many buyers will ask to see the proof of their claims either via the LED Lighting Facts label or website (www.lightingfacts.com/products)
 - Association with a program, backed by the DOE, that is nationally-recognized as the standard for product reporting accuracy
- Many LED product buyers/specifiers use LED Lighting Facts because:
 - Extensive online searchable product database of “Just the Facts” with ability to compare
 - Independently verified product performance (not self-reported)

Purpose and Objectives

Impact of Project (Intended): The project intends to increase independent, accurate, and verified SSL product performance information available to the market via a website and labels that are widely used and understood in the lighting industry, thereby inducing the market to use accurate performance claims and engage in fact-based competition, leading to more satisfied buyers and deeper energy savings.

1. The best indicator of program impact is the continued rapid growth of listed products in the database. Manufacturers wouldn't invest the time to register the products unless potential customers responded to the listing.
2. Progress toward our goals is measured by:
 - a. Number of partners; website visits and other web stats; number and mix of registered products; number of products verification tested; fraction of CALiPER-tested products that meet performance claims each year; fraction of LF verification tested products that meet performance claims
 - b. Metrics used in short, medium, and long-term measurements of impact

Approach

Approach:

- Designed web-based open-access platform for program ease-of-use and partner-centric interaction
 - All users have access to what they need (product submissions through advanced searches and downloads)
 - Flexibility to update process to better meet dynamic market needs
- Performance data is independently verified before it is listed
 - Using industry standardized test reports *from accredited labs* for photometry, reliability and thermal management for products and components (LM-79, LM-80 and ISTMT)
 - Requirements aligned with other regional/national programs to avoid duplication and reduce costs
- Partnership engagement promotes collaboration that allows program to keep pace with industry and stay relevant
- Verification testing and annual verification of product availability used to maintain data integrity

Key Issues

Key Issues:

- Lighting buyers need help sorting through and understanding LED product performance data, but few buyers and buyers' agents have the time and expertise to evaluate every product
- Frequent need to update information presents time and cost burdens to participating manufacturers and to third-party programs themselves
- Performance of SSL still varies widely within each product category
- There is still a lot of hype in the market place
- Manufacturers, buyers and specifiers are discouraged by the multiple lighting efficiency programs, lists and requirements
 - Manufacturers have become burdened with testing requirements, which slow speed to market and increase costs
 - The SSL market is moving considerably faster than the approval processes required by utilities and program sponsors in order to implement incentive programs

Distinctive Characteristics

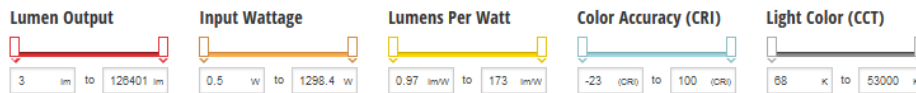
Distinctive Characteristics:

- Multiple online tools for evaluating and utilizing product data
 - **Advanced Product Search Tool:** Provides multiple options for finding, evaluating, and comparing listed products
<http://www.lightingfacts.com/Products>
 - **Utility Programs List:** Allows utilities to promote incentive programs by identifying and listing LED Lighting Facts products that meet qualification requirements <http://www.lightingfacts.com/UtilityPrograms>
 - **Product Performance Scales:** Helps users evaluate the data by comparing the performance values of the listed products to the performance values of standard lighting technologies
<http://www.lightingfacts.com/Library/Content/PerformanceScales>
- Provides a single repository of product data updated real-time as products are listed and verified; Point-of-entry for other programs, such as FEMP, DesignLights Consortium and NGL
- Constantly changing based on feedback and input from stakeholders
 - Data integrity policies to ensure that product listings are for real

Product Search/Results

Product Type: Luminaire Lamp Retrofit Kit

Product Categories	Use Location	Mounting Base	Subcategory	Product Size
Please select a Product Type to narrow by Product Category.	Please select a Product Type to narrow by Use Location.	Please select a Product Type to narrow by Mounting Base.	Please select a Product Type and Product Category to narrow by Subcategory.	Please select a Product Type and Product Category to narrow by Product Size.



Additional Product Metrics (CLICK TO COLLAPSE)



- Only include products that have been Verification Tested
- Only include products that have a warranty
- Only include products that have exact values
- Only include products with dimming information
- Only include products that have listed lumen maintenance

- Only include products that are:
- ENERGY STAR Certified
 - DLC Qualified
 - Winners of the Next Generation Luminaires competition
 - Participants in the GATEWAY Demonstration Program

Search Products By Keyword

Manufacturer, Model Number, etc.

Search

9817 TOTAL MATCHING PRODUCTS

[Download Results](#)
[Download Full List](#)

Sort By: Organization Brand Model Number Data Availability CURRENTLY DISPLAYING 20 OF 9817

Deluce Lighting Canada <input checked="" type="checkbox"/> Approved 9000016 Luminaire - Canopy BRAND: Deluce Lighting MODEL: DLCBOLED METRICS: Lumen Output: 7200 lm Input Wattage: 85 W Lumens per Watt: 84.71 lm/W Color Accuracy: 67 (CRI) Light Color (CCT): 5000 K View More Information <input type="checkbox"/> Add to Compare	Deluce Lighting Canada <input checked="" type="checkbox"/> Approved 9000016 Luminaire - Canopy BRAND: DELUCE MODEL: DLCBOLED METRICS: Lumen Output: 3100 lm Input Wattage: 42 W Lumens per Watt: 73.81 lm/W Color Accuracy: 87 (CRI) Light Color (CCT): 5000 K View More Information <input type="checkbox"/> Add to Compare	GTech Services, Inc. <input checked="" type="checkbox"/> Approved 9000016 Luminaire - Canopy BRAND: GTech Services, Inc. MODEL: G-CT 3535B,G105E METRICS: Lumen Output: 1348 lm Input Wattage: 12.1 W Lumens per Watt: 102.89 lm/W Color Accuracy: 83 (CRI) Light Color (CCT): 3141 K View More Information <input type="checkbox"/> Add to Compare	SHENZHEN OKT LIGHTL... <input checked="" type="checkbox"/> Approved 9000016 Luminaire - Directional BRAND: OKT LIGHTING MODEL: VS14-DH50 METRICS: Lumen Output: 4836 lm Input Wattage: 48.58 W Lumens per Watt: 92.27 lm/W Color Accuracy: 82 (CRI) Light Color (CCT): 4858 K View More Information <input type="checkbox"/> Add to Compare
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Deluce Lighting Canada Approved 3/20/2014
Not yet commercially available

BRAND: Deluce Lighting
MODEL: DLCBOLED
TYPE: Luminaire - Canopy
SKU: DLCBOLED

CERTIFICATIONS & AWARDS:
• DLC qualified

REQUIRED METRICS:	Lumen Output	Input Wattage	Lumens per Watt	Color Accuracy (CRI)	Light Color (CCT)
	7200 lm	85 W	84.71 lm/W	67 (CRI)	5000 K

ADDITIONAL METRICS:

Input Voltage: 120	Spacing Criteria (0-180°): 1.24
Power Type: AC	Spacing Criteria (90-270°): 1.22
Power Factor: 0.995	
DUV: 0.0044	
R9: -27	
Total Harmonic Distortion: 6.9	
Center Beam Candlepower: 2564	

GTech Services, Inc. <input checked="" type="checkbox"/> Approved 9000016	SHENZHEN OKT LIGHTL... <input checked="" type="checkbox"/> Approved 9000016	GTech Services, Inc. <input checked="" type="checkbox"/> Approved 9000016	GTech Services, Inc. <input checked="" type="checkbox"/> Approved 9000016
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Progress and Accomplishments

Lessons Learned:

The program's design is the foundation of its success

- Web-based platform provides flexibility to evolve with the fast pace of the market

Fostering strong partnerships within the industry drives the market for quality products

- Retailers, utilities, etc., all play a part in “holding manufacturers’ feet to the fire”

Truth-in-advertising is NOT self-reporting

- The industry needs objectivity – performance varies widely
- Association with DOE gives compelling third-party credibility

Verification of performance and market availability are necessary to ensure data integrity and meet the expectations of an evolving industry

- Verification testing to assure product performing as listed
- Process used to confirm market availability after initial listing

Alignment with other voluntary programs will ensure relevancy and value

- Supporting the industry means not hampering it with more hoops

Progress and Accomplishments

Accomplishments:

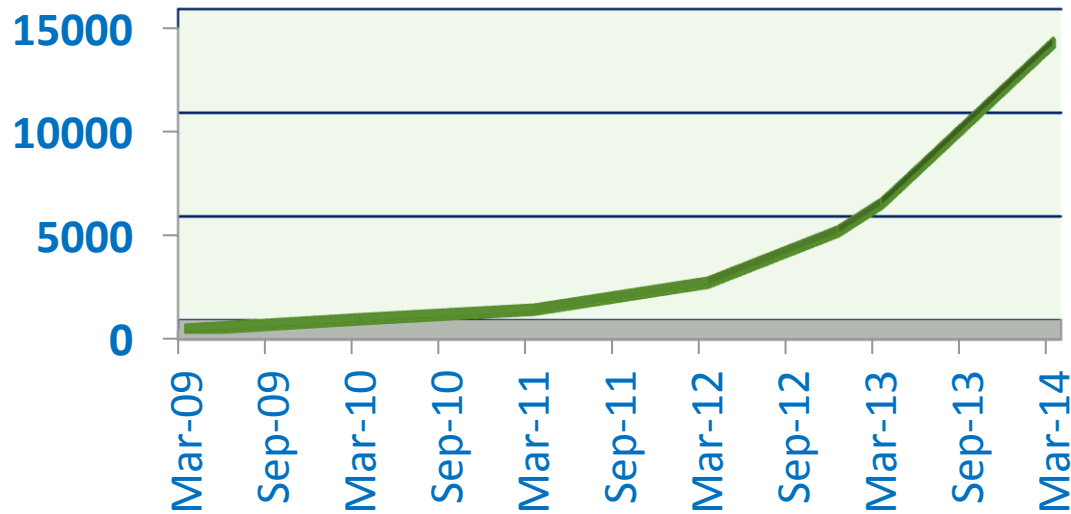
- **Over 14,000 products listed, from each available product category**
 - 600-1100 products submitted each month
 - 47% increase in monthly submissions from Jan 2013 to Jan 2014
 - Registry represents all general illumination types and applications
- **1,500 partners substantiate the program value**
 - 684 manufacturers, 360 retailers/distributors, 300 lighting professionals, 115 energy efficiency organizations
 - All have pledged to use the program to compare “apples to apples” on verified product performance.

Steadily growing website use:

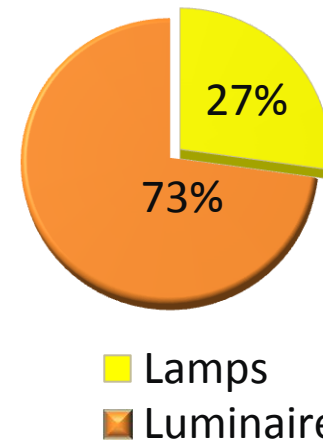
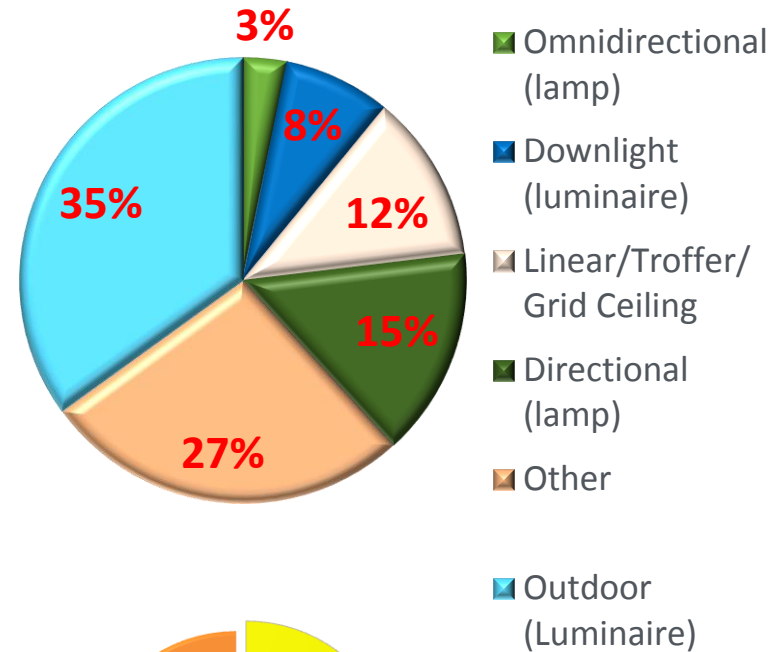
		2013 Monthly Average	2014 Monthly Average
General Overview	# Visits	8,425	9,154
	# Unique Visitors	5,739	6,128
	Pageviews	25,177	29,766
	Pages/Visit	2.98	3.26
	Avg Visit Duration	3.38	3.51
	Bounce Rate	45.58%	41.97%
	% New Visits	61.41%	58.70%

Five Years of Program Growth

**LED Lighting Facts Product Count
March 2009 - March 2014**



***Annual Product Status Update initiated in January 2013. Over 3400 products have been archived.**



Progress and Accomplishments

- **The verified data is valued by all**
 - Manufacturers use to promote product performance and gain access to major retailers
 - Buyers and specifiers use to verify products for purchase and promotion
 - Lighting industry uses for trend analysis
 - DOE and other organizations regularly use the LED Lighting Facts data to help industry stakeholders understand the current state of the LED lighting market and its trajectory
 - CALiPER Snapshot Reports report on a new product category quarterly, using the LED Lighting Facts data to compare the performance of LEDs to standard technologies
- **LED Lighting Facts is a one-stop resource for product quality assessment and integration across other key partner-centric programs**
 - Programs, such as DLC, NGL and FEMP are making LED Lighting Facts a base requirement because they can trust that the listed data is verified, thus reducing program cost and increasing effectiveness
 - As a result, LED Lighting Facts is a single:
 - point of entry for multiple programs and applications for manufacturers
 - repository of product data updated real-time as products are listed and verified for buyers and specifiers

Progress and Accomplishments

Market Impact:

- The integrated DOE SSL program estimated energy savings through the end of 2013 is 188 TBtu. (Savings from LED LF not separately estimated)
- Product registrations continue to increase at an increasing rate, because manufacturers know of the market impact (slide 12)
- Website stats continue to improve (slide 11)
- To accelerate impact, the website is regularly revised and updated with increased functionality
- Measured impacts far exceed planned impacts on almost every measure.
 - For example, FY14 goal is to add 5,000 products; 3,716 had been added by end of February, not even half way through the year

Awards/Recognition:

“LED Lighting Facts program makes evaluating potential suppliers straightforward.”

- Tom Harold, Grainger

“LED Lighting Facts offers an easily searchable database enabling a higher level of confidence in data accuracy.”

- Dan Mellinger, Efficiency Vermont

“LED Lighting Facts is a good traffic cop for quality.”

- The Home Depot

Project Integration and Collaboration

Project Integration: Three DOE/Industry Workshops per year, plus roundtable and joint planning sessions. Also regularly meet with industry reps at trade shows and other venues. An example of this coordination is a special project undertaken by LF with NEMA, numerous manufacturers, DLC, and utilities. Intensive process led to a means for greatly lowering testing costs, without sacrificing data accuracy.

Partners, Subcontractors, and Collaborators: PNNL subcontracts program to D&R International. Partners include long list of companies, utilities, retailers, lighting pros, others. Lighting Facts is part of integrated DOE SSL program, which includes elements in R&D, Market-based Technology Advancement, and Market Engagement.

Communications: Regular partner updates and webinars, representatives from LED Lighting Facts have been asked to attend or present at multiple industry forums, including Strategies in Light, The LED Show, W.W. Grainger Member Show, ACEEE Conferences, LightFair International.

Integration Example: Customized Program Portal

- Customized portal that allows for built in tools based on performance metrics
 - Uses Criteria Platform to “set bars”
 - Customized program look and feel
 - Web link and access to user site
- FEMP is the first to use capability
 - <http://lightingfacts.com/LFPowered/FEMP>
 - The products displayed are based on FEMP rule set and generated from the LED Lighting Facts product database
 - Constantly changes with new products added to LED Lighting Facts (as opposed to a static list)

Welcome!
Federal Energy Management Program
Acquisition Guidance for Lighting Products

Federal Energy Management Program (FEMP) Acquisition Guidance
Covered Product Category: Exterior Lighting

FEMP provides [acquisition guidance](#) and Federal efficiency requirements across a variety of product categories, including exterior lighting. Federal laws and executive orders mandate that agencies meet these efficiency requirements in all procurement and acquisition actions that are not specifically exempted by law.

The list below is pre-populated with LED products that have been verified by the LED Lighting Facts® program and meet the [FEMP-designated performance requirements](#) for 6 categories of exterior lighting products used for general illumination.

[View the Full List Now](#)

FEMP-Designated Product Category	Lumens @240V	Total Products by Category
Recessed	32	36
Full Recessed Canopy Luminaires	70	159
Parking Garage Luminaires	70	239
Outdoor Pole Arm Mounted Area/Recessed Luminaires	65	1140
Outdoor Wall Mounted Luminaires	60	351
Outdoor Pole Arm Mounted Decorative Luminaires	65	37

Product Count Timeline

2000
1500
1000
500
0

1937
Total Products

Jan 2015 Mar 2015 May 2015 Jun 2015 Aug 2015 Oct...

Customize Your Product Search

The FEMP Acquisition Guidance Product List can be filtered using the additional search criteria below. Once you have narrowed your search criteria, click on the [Update Results](#) button. The results or full list can also be downloaded to an excel file.

POWERED BY LED Lighting Facts®

The FEMP Acquisition Guidance Product List is Powered by LED Lighting Facts. The products that appear in this list are generated from the LED Lighting Facts product database and have been verified by the LED Lighting Facts program.

+ Product Category (CLICK TO EXPAND)

+ LED Lighting Facts Label Metrics (CLICK TO EXPAND)

+ Additional Metrics (CLICK TO EXPAND)

+ Qualifications (CLICK TO EXPAND)

Search Products By Keyword [Update Results](#)

1937

[Download Results](#)

[Download Full List](#)

TOTAL MATCHING PRODUCTS

Sort By: Organization Brand Model Number [Date Updated](#) [Currently Viewing 20 of 1937](#)

Philips Lighting <input checked="" type="checkbox"/> Approved 10/6/2013 Luminaire - Decorative BRAND: Philips Metro MODEL: VLT1242521VNA	Santa & Cole <input checked="" type="checkbox"/> Approved 10/6/2013 Luminaire - Area/Roadway BRAND: Santa & Cole MODEL: RAJA R8	Philips Lighting <input checked="" type="checkbox"/> Approved 10/6/2013 Luminaire - Decorative BRAND: Philips Metro MODEL: VLT1242521VNA	jiangsu yongjiong ... <input checked="" type="checkbox"/> Approved 10/6/2013 Luminaire - Canopy BRAND: YJL MODEL: YJL02355-H-SW1P
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Next Steps and Future Plans

- **Future Project Activities:**
 - Expand to provide customized portals for utilities to filter products on LED Lighting Facts for incentive programs
 - Respond to growing interest from other countries to leverage LED Lighting Facts platform and functionality
 - Customize to performance standards, requirements, language
- **Impacts:**
 - Coordinated platform could build from initial DOE investment to serve multiple countries committed to adoption of LED lighting
 - This helps U.S. market by adding international pressure for better, higher performing SSL products
 - Common database means manufacturers who sell into multiple markets may use single platform and select countries to qualify
 - Global and national databases to measure and monitor LED lighting markets

REFERENCE SLIDES

Project Budget

Project Budget: \$250k for Jul 2008 thru FY09; \$980k for FY10; \$825k for FY11; \$559k for FY12; \$1.16 M for FY13

Variances: Planned budget was cut in FY12 due to unexpected cut in SSL program budget

Cost to Date: \$4.305 for all years; \$531k for FY14

Additional Funding: DOE provides all financial support; beginning discussions with other countries to cost share

Budget History

FY2008– FY2013 (past)		FY2014 (current)		FY2015 – FY2009 (planned)	
DOE	Cost-share	DOE	Cost-share	DOE	Cost-share
\$3.774 M	\$1.476 M	\$1.062 M	\$1.200 M	\$3.717 M	~ 4.000 M

Project Plan and Schedule

- Project milestones: # of listed products, # of verification/quality assurance tested products
- LED Lighting Facts Milestones are established on an annual, not quarterly, basis.
- Annual milestone for new product listings has consistently been exceeded.
- FY 14 Milestone was rescheduled due to complete restructuring of approach to verification testing that resulted from consultations with NEMA. Restructuring occurred concurrently with major restructuring of website.

Project Schedule				
Project Start: January 2009		Completed Work		
Projected End: September 2019		Active Task (in progress work)		
	◆	Milestone/Deliverable (Originally Planned)		
	◆	Milestone/Deliverable (Actual)		
	FY2012	FY2013	FY2014	FY2015
Task	Q1 - Q4: Oct - Sept	Q1 - Q4: Oct - Sept	Q1 - Q4: Oct - Sept	Q1 - Q4: Oct - Sept
Past Work				
FY 2012 Milestone: 1200 products listed	3575 Products Listed	◆		
FY 2013 Milestone: 1500 Products added		+5803 Products	◆	
FY 2013 Milestone: 20 Products Veri. Tested		20 Products	◆	
Current/Future Work				
FY 2014 Milestone: 5,000 products added			◆	
FY 2014 Milestone: 150 Products Verification Tested			◆	

Product Performance Data

- Manufacturer reported performance data is checked against industry standard test reports from approved labs.

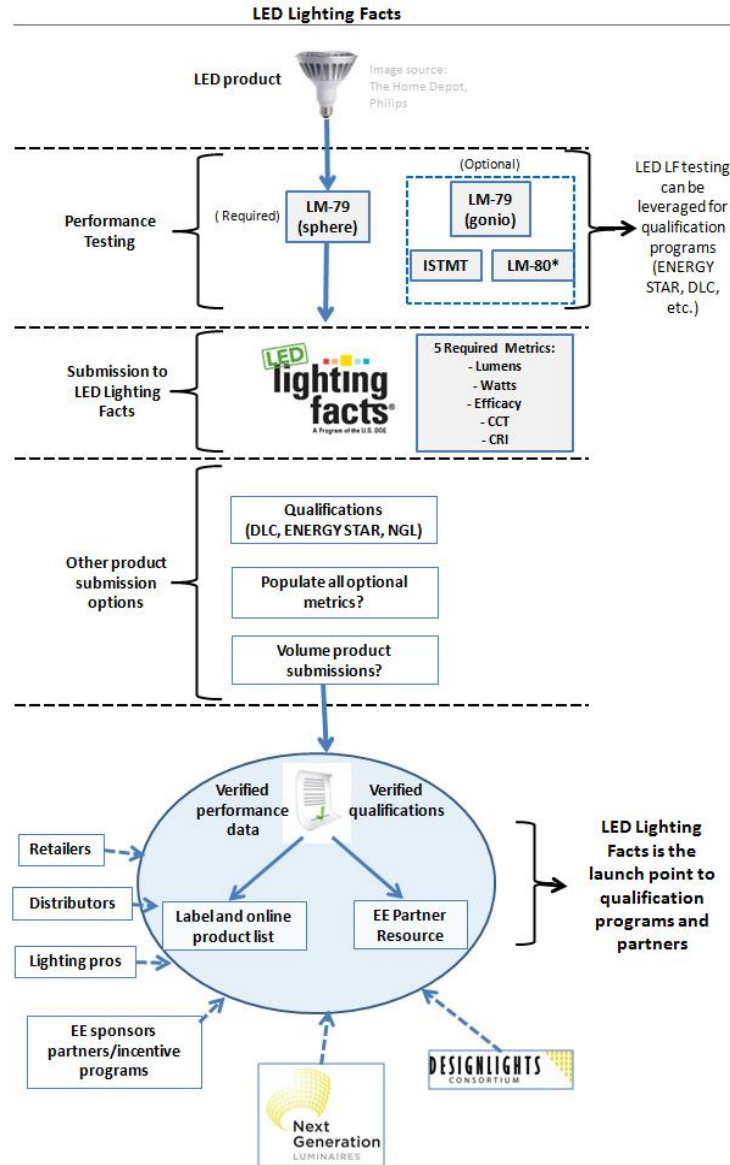
Required Label Metrics

- Lumens
- Watts
- Efficacy (lumens/watt)
- CCT
- CRI

Optional Metrics


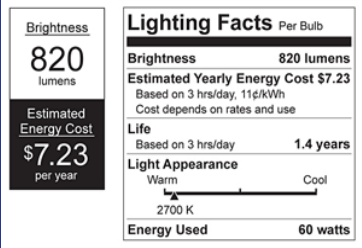
- Certifications (DLC/Energy Star)
- Zonal Lumen Density (0-60°)
- Zonal Lumen Density (60-90°)
- Zonal Lumen Density (90-120°)
- Zonal Lumen Density (120-180°)
- Input Voltage
- Power Factor
- Power Type (AC/DC)
- Duv
- R9
- THD
- Lumen Maintenance

Program Process Review



DOE Lighting Facts and FTC Label

Key Differences

 <p>DOE Lighting Facts Label</p>	 <p>FTC Lighting Facts label Mandatory January 1, 2012</p>
	<div style="display: inline-block; width: 45%; text-align: left;">Front</div> <div style="display: inline-block; width: 45%; text-align: right;">Back</div>
All fixture and lamp types	Medium screw base light bulbs only
SSL only	SSL, fluorescent, incandescent, and halogen
Voluntary	Mandatory
Not required on packaging	Required on packaging
Label for buyers and utilities	Label for Consumers
Lifetime not listed	Lifetime listed
LM-79 testing required, claims verified by DOE, and ongoing QA	No lifetime testing specified, Manufacturer reported claims

Information available at www.lightingfacts.com/ftclabel