DLC Solid State Lighting QPL

Irina Rasputnis – DLC
Jenna Winer – D+R International
Overview

• You now know “the basics” of the DLC: why it exists, who runs it, who the Members are
• You want to be more involved
• How do I participate? How do I get my products qualified?
• How are DLC decisions made? How do they decide what categories are eligible, what the performance requirements will be, and other nuances?
Agenda

• How to qualify products
  – Overview
  – Key details
  – Where to find more information

• DLC decision making
  – “How to win friends and influence people—the DLC”

Preview of the 2016 DLC Stakeholder Meeting!
Generalized DLC Development Process

• DLC aggregates requests/suggestions for developments
  – Maintain “wish lists”
  – Specification Development (new categories)
  – Specification Revisions (new performance thresholds)
  – Policy Development (new or revised policies)

• Prioritize wish lists periodically
  – Program management judgement
  – Active review with Technical Committee
  – Surveys of Members

• Prioritized tasks undertaken for development
  – Any significant program changes to through Stakeholder Input Process (SIP)
I Sell LED Lighting: How Do I Qualify a Product?
How Do Products Get Qualified?

1. Product is tested at acceptable laboratory
2. Test data submitted to DLC for review
3. If product meets criteria, added to QPL
Testing and Reporting Requirements

- Photometric and Electrical Properties
  - IES LM-79 Electric and Photometric
    - Output and color: integrating sphere
    - Light distribution: goniophotometer
- Lumen maintenance (Option 1)
  - LED package/module/array testing
    - IES LM-80 Lumen Maintenance
  - Luminaire-level testing
    - ISTMT (ANSI/UL1598)
  - L70 determination
    - IES TM-21 Projecting Lumen Maintenance
### DLC Technical Requirements Table

#### Breakout Session: Transition to V4.0
- **Wednesday: 1-2**
- **Ballroom A**

### Technical Requirements: Luminaires

<table>
<thead>
<tr>
<th>#</th>
<th>Category</th>
<th>General Application</th>
<th>Minimum Light Output (lm)</th>
<th>DLC Standard</th>
<th>DLC Premium*</th>
<th>Primary Life**</th>
<th>Distribution</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Outdoor</td>
<td>Use Output</td>
<td>200,000</td>
<td>90</td>
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<td></td>
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<tr>
<td>2</td>
<td>Outdoor</td>
<td>Mid-Output</td>
<td>150,000</td>
<td>120</td>
<td>125</td>
<td>130</td>
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<td>3</td>
<td>Outdoor</td>
<td>High-Output</td>
<td>100,000</td>
<td>150</td>
<td>160</td>
<td>170</td>
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<tr>
<td>4</td>
<td>Interior</td>
<td>Spot</td>
<td>1000</td>
<td>50</td>
<td>55</td>
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<tr>
<td>5</td>
<td>Interior</td>
<td>Pendant</td>
<td>1000</td>
<td>50</td>
<td>55</td>
<td>60</td>
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<td>6</td>
<td>Interior</td>
<td>Linear</td>
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<td>7</td>
<td>Interior</td>
<td>High-Bay</td>
<td>25,000</td>
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<td>130</td>
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</table>

#### Technical Requirements: Retrofit Kits*

<table>
<thead>
<tr>
<th>#</th>
<th>Category</th>
<th>General Application</th>
<th>Minimum Light Output (lm)</th>
<th>DLC Standard</th>
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<td>125</td>
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<tr>
<td>3</td>
<td>Outdoor</td>
<td>High-Output</td>
<td>100,000</td>
<td>150</td>
<td>160</td>
<td>170</td>
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</tbody>
</table>

### Technical Requirements: Lamps**

<table>
<thead>
<tr>
<th>#</th>
<th>Category</th>
<th>General Application</th>
<th>Minimum Light Output (lm)</th>
<th>DLC Standard</th>
<th>DLC Premium*</th>
<th>Primary Life**</th>
<th>Distribution</th>
</tr>
</thead>
<tbody>
<tr>
<td>15</td>
<td>Pendant</td>
<td>Down Light Replacement</td>
<td>In luminaire: 2500</td>
<td>100</td>
<td>110</td>
<td>120</td>
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</tr>
<tr>
<td>16</td>
<td>Pendant</td>
<td>Down Light Replacement</td>
<td>In luminaire: 2500</td>
<td>100</td>
<td>110</td>
<td>120</td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>Pendant</td>
<td>Down Light Replacement</td>
<td>In luminaire: 2500</td>
<td>100</td>
<td>110</td>
<td>120</td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>Pendant</td>
<td>Down Light Replacement</td>
<td>In luminaire: 2500</td>
<td>100</td>
<td>110</td>
<td>120</td>
<td></td>
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</tbody>
</table>

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See Prior evening’s DLC 2005 Requirements in Table 4, below.
Will DLC Accept My Test Reports?
What are DLC Lab Requirements?

• Evolved based on Stakeholder Input 2012-2013
• LM-79: Recognized by DOE’s LED Lighting Facts
• LM-80: Recognized by EPA’s ENERGY STAR
• ISTMT
  – OSHA approved Nationally Recognized Test Lab (NRTL), or
  – Approved through OSHA NRTL data acceptance program or OSHA Satellite Notification and Acceptance Program (SNAP), or
  – Accredited by ILAC-MRA Accreditation Body for SSL thermal testing (ANSI/UL 1598 and/or CSA equivalent)
• LM-84 (Option 2): Recognized for LM-79 by DOE’s LED Lighting Facts and accreditation (by DOE LED Lighting Facts approved accreditation body) includes LM-84-14
Back to the Application Process
QPL: Manufacturer Application Process

• Single Product Application
  – Single products
  – CCT variations
  – Voltage variations
  – Dimming variations

• Family Grouping Application
  – Other allowable variations, features for Specialty, Premium
  – Offline communication key!
  – Pre-reviewed “test plan” often helpful

• Private Label/Multiple Listing
  – For listing of products already on the QPL under different names
Process: Single Product Applications

- Complete and compile all necessary testing
- Compile all necessary additional documentation
- Fill out Application Form (offline)
- Create application through Manufacturer Portal
  - Log-in to online system
  - Upload Application Form and supporting documents
- DLC staff review for eligibility and completeness
  - Invoice information provided through Portal
- Manufacturer logs in and submits payment
- DLC staff complete thorough review of application
  - If product passes, added to QPL
  - If products fails or questions arise, DLC staff communicate with the manufacturer

Breakout Session: DLC Documentation
Tuesday: 4:30-5
Ballroom A

Breakout Session: DLC Documentation
Wednesday: 2:30-3
Central City
Process: Single Product Applications

Initial Review
- 2 business days
  - Completeness/eligibility
  - Additional clarification needed extends time before invoice can be provided

Invoice

Comprehensive Review
- 10 business days
  - Thorough review for compliance with requirements
  - Additional clarification needed extends review time
Process: Single Product Applications
Process: Single Product Applications

Single Product Applications

The following information describes the process of completing the manufacturer electronic application form - to be used by manufacturers who wish to submit their solid-state lighting (SSL) products to be considered for the DesignLights Consortium™ Qualified Products List (DLC QPL). The submission form requires the manufacturer to provide information on the product’s rated performance, as well as company information and details about how the product is designed, and test data demonstrating the product’s performance. Measured performance is verified against the test reports provided.

The process described below is for single product applications only. Please see below for the definition of a single product application. For groups of products please see the family group instructions.

Please review the following before applying:
- The DLC QPL categories and requirements
- The Independent Testing Lab Requirements

Quick Links
- General Application Instructions
- Application Fees
- Application Review Time Frames
- Completing the Single Application Form
- Forms
Process: Single Product Applications

Application Review Time Frames
Prior to sending payment information for application fees, a DLC reviewer will conduct an initial review of documentation submitted to ensure the application is complete and the submitted product is eligible for DLC qualification. Upon payment of the application fees, a DLC reviewer will conduct a comprehensive review of the performance information submitted against the technical requirements. Below are time frames for these steps for each application type:

<table>
<thead>
<tr>
<th>Application Type</th>
<th>Initial Review</th>
<th>Comprehensive Review</th>
</tr>
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<tbody>
<tr>
<td>Private Label</td>
<td>5 business days</td>
<td>5 business days</td>
</tr>
<tr>
<td>Single Product</td>
<td>2 business days</td>
<td>10 business days</td>
</tr>
<tr>
<td>Family Groupings</td>
<td>5 business days</td>
<td>10 business days</td>
</tr>
</tbody>
</table>

Quick Links
- General Application Instructions
- Application Fees
- Application Review Time Frames
- Completing the Single Application Form
- Forms

Forms
- Product Application Form (.xlsx)
- Test Report Authorization Form (.docx)
- Self-certification Statement (.PDF)
Process: Single Product Applications

Fill out form completely AND accurately!
# Process: Single Product Applications

**Instructions:** The table below MUST be filled out with scaled performance information for each product submitted for qualification.

Below, please explain the scaling methodology used for any values listed in the Scaled Performance Table.

**Scaled Methodology Explanation:**

Please note the following:

1. **CCT** should be entered in the spreadsheet without the unit (K).
2. **THD** should be entered into the spreadsheet as a whole number. Do not list as a decimal or convert to percentage. e.g., 55.43 is correct, not 0.5543 or 55.43%.
3. **Power Factor** is reported as a decimal on the ELECTREL. Please make sure you are entering Power Factor as a decimal, not a whole number.

<table>
<thead>
<tr>
<th>General Application</th>
<th>Primary/ Specialty Use Designation</th>
<th>Classification (Standard/ Premium)</th>
<th>Model Number</th>
<th>Scaled Initial Light Output (Bolts)</th>
<th>Scaled Luminance Efficacy (Im/W)</th>
<th>Scaled Input Power (W)</th>
<th>Scaled Total Harmonic Distortion (THD)</th>
<th>Scaled Power Factor</th>
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**Application Form**  |  **Scaled Performance Table**  |  **Category Reference**
Process: Family Grouping Applications

- Intended for products lines which have modular, scalable performance characteristics
- Contact info@designlights.org prior to testing to discuss family characteristics and testing plan
- Testing sufficient to “bracket” group:
  - Scaled performance tables/identification of worst-case members
  - LM-79s for lowest light output, lowest efficacy, additional CCTs
  - IES files for additional optics
  - LM-80 for LED package/module/array
  - ISTMT for worst case thermals
  - Electrical testing for worst case PF/THDi
  - In-house driver output electrical measurements for driver characteristics
- Please read full policy and instructions
  - At www.designlights.org
  - In the Manufacturer’s Guide!
Process: Family Grouping Applications

Initial Review
- 5 business days
- Completeness/eligibility/sufficient testing
- Additional clarification needed extends time before invoice can be provided

Invoice

Comprehensive Review
- 10 business days
- Thorough review for compliance with requirements
- Additional clarification needed extends review time
Process: Family Grouping Applications

Family Grouping Applications

The following information describes the process of completing the manufacturer electronic application form - to be used by manufacturers who wish to submit their solid-state lighting (SSL) products to be considered for the DesignLights Consortium™ Qualified Products List (DLC QPL). The submission form requires the manufacturer to provide information on the product’s rated performance, as well as company information and details about how the product is designed, and test data demonstrating the product’s performance. Measured performance is verified against the test reports provided.

The process described below is for Family Grouping applications only. Please see below for the definition of a Family Grouping application. For single products please see the single product instructions.

Please review the following before applying:
- The DLC QPL categories and requirements
- The Independent Testing Lab Requirements
- What Is Worst Case presentation (pdf)
- Scaled Performance Methodology presentation (pdf)

Quick Links
- Family Grouping Definition
- Family Grouping Testing Requirements
- Family Grouping Testing Guidance
- General Application Instructions
- Application Review Time Frames
- Application Fees
- Completing the Product Family Application Form
- Forms
Process: Family Grouping Applications

Family Grouping Testing Requirements

The Family Grouping policy is designed to reduce testing burden as well as reduce the required by manufacturers to test groups of products that comply with the Family Group testing and listing all products individually. By identifying the worst case models, testing can be provided if the worst case models demonstrate compliance with the Technical Requirements. Many of the Technical Requirements are minimum requirements, by demonstrating that within a group meet the minimum requirements, it can be assumed that models per family case models will also meet the requirements, and therefore do not require testing. The requirements include the minimum testing required for a family group.

Click on any of the criteria below to read additional testing guidance.

Family Grouping Testing Guidance

Minimum Light Output

- The product that is expected to have the lowest overall light output [or lumen-per-foot, as appropriate] be tested according to LM-79. In general, this is expected to be the product with the lowest total drive current, least efficient optics, and lowest CCT within the family group.
- Please note that if your family group application seeks qualification for your products in more than one Technical Requirement, testing must demonstrate compliance with the requirements for each one of them. This may result in the need to provide additional "worst-case light output" LM-79s, or for a single evaluated more than once.
- The only exception to the above will be for groups that cross light output bins. In outdoor categories, these groups must supply worst-case light output testing for the whole group, determination of appropriate bin for family members will be made on the basis of the scaled performance table, that testing must still demonstrate compliance with all efficacy levels, as noted below in the section.
Process: Family Grouping Applications

Fill out form completely AND accurately!
Process: Private Labeling Applications

- For “multiple listing” of products by >1 manufacturer
- OEM product must already be qualified
- Submit Private Label Application form
- Submit Private Label Agreement form (New!)
- Submit signed Self-Certification Statement by private labeler
- Submit spec sheets of private labeler
- Proposed: Safety certification under private labeler’s organization/model number
Process: Private Labeling Applications

Initial Review
- 5 business days
- Completeness/eligibility
- Additional clarification needed extends time before invoice can be provided

Invoice

Comprehensive Review
- 5 business days
- Thorough review for compliance with requirements
- Additional clarification needed extends review time
Process: Private Labeling Applications

**Required Documentation**
- Download and complete the [Private Label Application form (xlsx)](#). The OEMs qualify downloaded directly from the DLC QPL and the model numbers listed in the form. Include downloadable products from the DLC QPL are available in the new How to Download the DLC QPL.
- Download and complete the [Private Label Agreement form (docx)](#). This private label signed by representatives of all organizations involved, and filled out in its entirety. Listing products under different brand names, the signature of a representative of the sufficient.

**Quick Links**
- [Required Documentation](#)
- [Application Fees](#)
- [Application Review Time Frames](#)
- [Forms](#)

**Forms**
- [Private Label Application form (xlsx)](#)
- [Private Label Agreement form (docx)](#)
- [Self-certification Statement (PDF)](#)
Common Pitfalls

• Failure to read instructions!
  – General instructions and category-specific requirements

• Not providing all necessary test information and associated documentation
  – Spec sheets for model and LED package/module/array, official warranty, safety documentation, Self-Certification Statement, installation instructions, etc.

• Get defensive when questions are asked

• Check out this week’s Breakout Sessions for more information on product qualification and common stumbling blocks!
# Breakout Sessions

<table>
<thead>
<tr>
<th>breakout session</th>
<th>Date</th>
<th>Time</th>
<th>Location</th>
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<tbody>
<tr>
<td>Using DLC Logos to Get the Most out of Your Qualified Products</td>
<td>Tuesday</td>
<td>3-4pm</td>
<td>Ballroom A</td>
</tr>
<tr>
<td>Transition to Technical Requirements Table V4.0</td>
<td>Wednesday</td>
<td>1-2pm</td>
<td>Ballroom A</td>
</tr>
<tr>
<td>SSL: Family Grouping – What is Worst Case?</td>
<td>Tuesday</td>
<td>4-4:30</td>
<td>Ballroom A</td>
</tr>
<tr>
<td></td>
<td>Wednesday</td>
<td>2-2:30</td>
<td>Central City</td>
</tr>
<tr>
<td>SSL: Updating Products</td>
<td>Tuesday</td>
<td>4-4:30</td>
<td>Ballroom B</td>
</tr>
<tr>
<td></td>
<td>Wednesday</td>
<td>2-2:30</td>
<td>Onyx</td>
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<tr>
<td>SSL: QPL Supporting Documentation</td>
<td>Tuesday</td>
<td>4:30-5</td>
<td>Ballroom A</td>
</tr>
<tr>
<td></td>
<td>Wednesday</td>
<td>2:30-3</td>
<td>Central City</td>
</tr>
</tbody>
</table>
How Do I Get More Involved?
Remember: Why does the DLC exist?

Answer: To serve the needs of the DLC Members!
DLC Members
DLC Structure

Members
• Drive DLC direction
• Member and customer needs
• Savings goals

Advisors
• Advise Members on key issues
• Key industry experts

Industry
• Provide industry input
• Technical expertise
• Market knowledge

DLC
General Thoughts and Suggestions

• You must understand the DLC, utility/efficiency programs, needs of the Members
  – Comments and requests that demonstrate a lack of understanding are difficult to move forward
• Demonstrating significant energy savings can help
  – Reality: DLC is resource constrained like everyone else
  – Market research: what is the realistic energy savings potential?
• Specific suggestions can help
  – Reduces legwork/cost for program to develop from scratch
• Be friendly. Or at least professional.
How Do I Get Involved?

• Join us at the DLC Stakeholder Meeting (Welcome!)
  – Annual event
  – Understand program/Members; interact with other stakeholders; build coalitions

• Join our mailing list
  – Email us at info@designlights.org with subject “Sign Me Up!”
  – Industry Update comes out ~quarterly
  – Comment during Stakeholder Input Process
  – Monitor the DLC News on the DLC homepage

• Articulate interests to efficiency programs by highlighting projects by their customers!
  – Efficiency programs under many different sets of constraints
  – Often will have custom programs, when prescriptive programs not yet practical
Generalized DLC Development Process

• DLC aggregates requests/suggestions for developments
  – Maintain “wish lists”
  – Specification Development (new categories)
  – Specification Revisions (new performance thresholds)
  – Policy Development (new or revised policies)

• Prioritize wish lists periodically
  – Program management judgement
  – Active review with Technical Committee
  – Surveys of Members

• Prioritized tasks undertaken for development
  – Any significant program changes to through Stakeholder Input Process (SIP)
Stakeholder Input Process

• Identify issue for input – new spec, update to existing spec, change to DLC procedure, etc.
• Provide clear request to stakeholders for input
  – Sent to entire distribution list (manufacturer, testing labs, lighting designers, specifiers, members)
  – Sent via email, posted on website
  – Includes firm response date
• Use ad-hoc respondent committee to review input
• Discuss critical issues via conference call and create a “statement of input”
• Deliver input to DLC Technical Committee
What If There Is No Category?

• DLC can only qualify products that are intended for applications that have categories (Primary Uses) on the Technical Requirements Table

• DLC does not currently have categories for every possible lighting application

• Dozens of categories and policies outstanding on wish lists
  – NEW: Wish lists published on the DLC website
Wish Lists

Specification and Policy Development

The DLC continually strives to identify products that will deliver significant energy savings via luminaire-level performance specifications. The evolution of LED technology, market transformation, efficiency regulations, and consumer incentives are shaping agents in DLC's progressive policy development.

**Efforts in Process:**

<table>
<thead>
<tr>
<th>Effort</th>
<th>Description</th>
<th>Time Frame for Next Steps</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Specification Review</strong></td>
<td>DLC regularly evaluates the performance requirements for existing Primary Use Designations. These efforts are conducted through the Specification Revision process.</td>
<td>July 18, 2016 Proposals for Allowances under V4.0 Technical Requirements due. See Announcement Cover Letter for details.</td>
</tr>
<tr>
<td><strong>Specification Development</strong></td>
<td>DLC evaluates the need for new Primary Use Designations based on industry and member feedback. These efforts are conducted through the Specification Development process.</td>
<td>September 7, 2016 Comments on draft V4.3 Technical Requirements, covering several additions and revisions, are due. See Draft Announcement Cover Letter for details.</td>
</tr>
<tr>
<td><strong>Policy Development</strong></td>
<td>DLC regularly evaluates the policies and procedures for products to be tested, evaluated, and included in the DLC QPL. These efforts are conducted through the Policy Development process.</td>
<td>July 2016 Framework proposals and drafts of new policies out for feedback.</td>
</tr>
<tr>
<td><strong>Surveillance Testing</strong></td>
<td>DLC has been developing a performance verification program for qualified products to monitoring the totality of data submitted to the DLC SSL QPL pre- and post-qualification.</td>
<td>Fall 2016</td>
</tr>
<tr>
<td><strong>Category and Policy Development Wish Lists</strong></td>
<td>These wish lists are running compilations of all new categories and policies DLC has been asked to develop.</td>
<td>Ongoing</td>
</tr>
</tbody>
</table>

Category and Policy Development Wish Lists:

**About SSL QPL Category and Policy Development**

Category and policy development for the DLC SSL QPL is a yearly process involving input from Members, stakeholders, and our Technical Committees. The DLC strives to be responsive to the constantly-evolving SSL market and ensure that our updates serve the needs and interests of both our Member companies and our many industry stakeholders equally.

**The Category and Policy Development Process**

The DLC maintains an uninitiated wish list comprised of requests for new categories of products and new policies from DLC Members, manufacturers, and other stakeholders. We use this wish list as a jumping-off point for our yearly category and policy development process. See below for an illustration of the annual process that DLC undergoes to update categories and policies for the QPL.

**2016 Category Wish List**

The category wish list is a running compilation of all the new categories the DLC has been asked for at some point, in no particular hierarchy or order. The list is reviewed periodically to identify priorities for specification development. The DLC does not guarantee that any of the categories listed below will be developed or the timeframe for when they might be developed.

**Updated July 2016.**
Specification Development/Revision History

V1.5
September 28, 2010
DLC begins!

V1.6
July 22, 2011
Modest efficacy revisions

V1.7
November 12, 2012
Additional categories

V2.0
April 5, 2013
Significant efficacy revisions

V2.1
July 18, 2014
Additional categories

V3.0
June 23, 2015
New structure

V3.1
November 20, 2015
Additional categories

V4.0
June 1, 2016
Substantial efficacy revisions

In process!
V4.0 Transition Timeline

Finalized V4.0 TRT Announcement: 
June 1, 2016

Cutoff for Submission under V3.0/V3.1: 
August 31, 2016
• Allows submission of products currently in process

V4.0 Compliant Products Identified on QPL: 
January 2017
• Allows programs to filter/sort/search as needed

Delisting of products not meeting V4.0: 
April 1, 2017
Specification Development/Revision

• Since last year...V3.1 and V4.0 released!
  – V3.1: Screw-Based Replacements for HID Lamps, Full-Cutoff and Non-Cutoff/Semi-Cutoff Wall-Mounted Area Luminaires, Retrofit Kits for Direct Linear Ambient Luminaires, 2, 3, 4-lamp External Driver Lamp-Style Retrofit Kits
  – V4.0: Revised performance thresholds (efficacy)
• Current efforts focused on adding Primary Uses to V4.0
  – PL lamps (draft sent out 6/16), hazardous environment lighting, higher-output outdoor lighting, backlighting for signs, medium screw-base LED replacements for HID lamps, additional styles of fluorescent replacement lamps
  – Allowances for V4.0 efficacy requirements
  – Horticultural Lighting

Discussion Session:
SSL Category & PUD
Wed: 10:30-12
Onyx
Recent Policy Development Changes

• Revision to the Retrofit Kit Policy
  – Addition of “Option B” testing for Luminaire Specific Retrofit Kits
  – Discussion Session at 2015 Stakeholder Meeting

• Revision to the Family Grouping Policy
  – Allowance of driver variations within a Family Group
  – Discussion Session at 2015 Stakeholder Meeting
Policy Development Efforts

• 3 policies out for comment via SIP
  – Requiring safety certification for private labels
  – Adoption of ANSI C78-377-2015
  – Clarification on Rated Data

• 2 requests for proposals for policies
  – DC/PoE systems
  – White Color Tuning luminaires
Thank You!

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