



Horticultural Lighting V4.0 Draft Policy Webinar

November 21, 2024

Agenda

- **Introduction**
- **Webinar Logistics**
- **V4 Overview and Timeline**
- **V4 Baseline Requirement Proposal**
- **V4 Review**
- **Hort Operations V4 and Pre-V4 Expedite Pilot**
- **Q&A**

Introductions

Presenters & Q&A Support



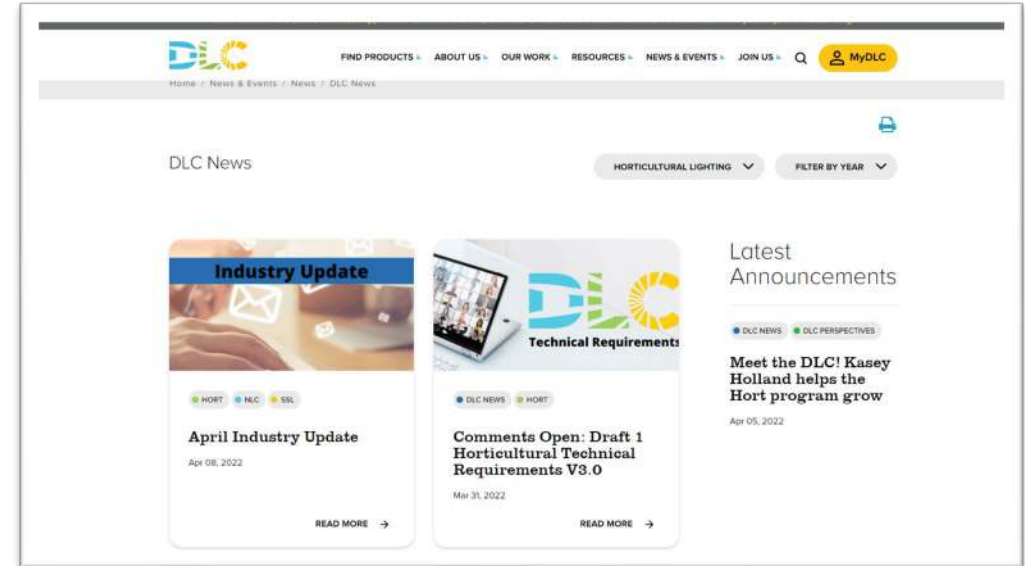
Kasey Holland
Technical Manager
(Hort & SSL)



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Senior Technical
Operations Manager

Webinar Logistics

- Slides and recorded webinar will be posted on the *DLC News & Events* page at www.designlights.org shortly after today's presentation
- All attendees are automatically muted
 - If you experience technical issues, please use the Chat feature to let us know



Questions and Answers

- We will leave **15 minutes** after the presentation to answer questions. Please enter your Questions pane in GoToWebinar.
 - DLC technical support team will answer questions as they come in via the Questions pane
 - Some questions will be answered aloud (anonymously) at the end during the Q&A session




The screenshot displays the GoToWebinar interface with two panes open. The top pane is titled 'Audio' and includes a 'Sound Check' indicator with a green signal strength icon. Below this, there are three radio button options: 'Computer audio' (selected), 'Phone call', and 'No audio'. A microphone icon and a volume slider are visible, along with a dropdown menu for 'Microphone (Realtek High Definition...'. Below the microphone is a speaker icon and a volume slider, with a dropdown menu for 'Speaker/HP (Realtek High Definition...'. The 'Talking:' section is currently empty.

The bottom pane is titled 'Questions' and has a checkbox for 'Show Answered Questions' which is checked. Below this is a table with columns for 'X', 'Question', and 'Asker'. The table is currently empty. At the bottom of the pane, there are two buttons: 'Send Privately' and 'Send to All'. Below the buttons, the text 'Test Webinar' and 'Webinar ID: 739-969-195' is displayed. At the very bottom, the GoToWebinar logo and name are visible.

Comment Forms

All comments must be submitted using DLC Comment Forms. Please download the Comment Form and submit the completed forms to comments@designlights.org

 Comment Form Instructions			
Document: Technical Requirements for Horticultural Lighting V4.0			
Version: Draft 1			
Comments Due: Close of business, Thursday, December 19, 2024			
Instructions and Background:	Please follow these steps to ensure your comments are received and considered by the DLC:		
	1. Enter your Organization, Name, Email Address, and Phone Number in Row 8 of this worksheet.		
	2. There are zero (0) new sections included in this release. Comments to Hort V4.0 may be added at the "General Comments" tab.		
	3. Save this Excel file with your comments and include your organization name appended to the end of the filename (for example: "DLC_Hort-V4.0Draft1_CommentForm_AcmeLightingCo").		
4. Email the file to comments@designlights.org by close of business, Thursday, December 19, 2024 .			
Reviewer Organization	Reviewer Name	Reviewer Email Address	Reviewer Phone #



V4.0 Overview and Timeline

Hort Technical Requirements Goals



Accelerate adoption of energy efficient lighting in CEA



Support efficiency programs and aid end users using the QPL to identify and select products that are eligible for rebates

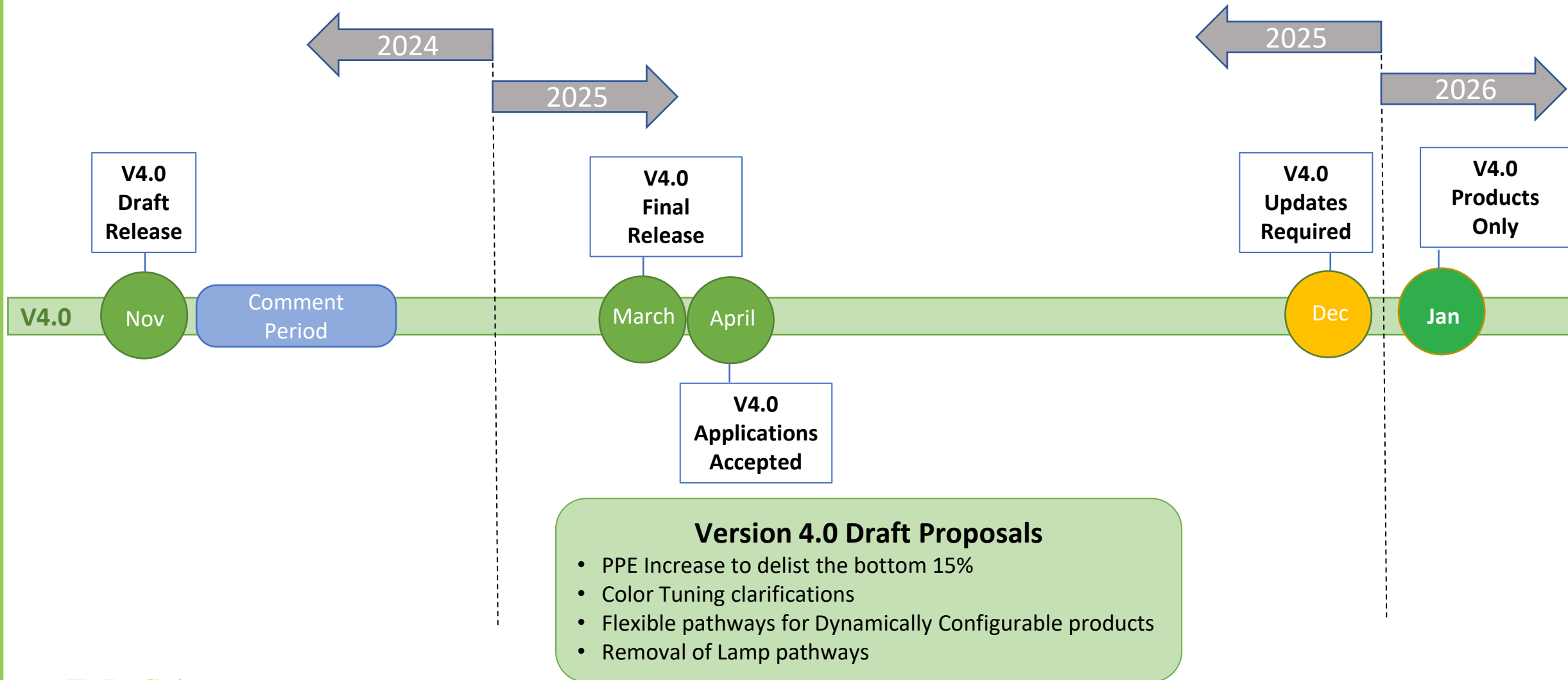


Protect the integrity and value of the QPL for all stakeholders

Hort Version 4.0

- Version 4.0 is a major revision that proposes three key updates
 - Increase the Efficacy Threshold
 - Clarifications/Enhancements to existing technical requirements
 - Spectrally Tunable
 - Dynamically Configurable vs DC-Powered
 - LM-80 applicability and more
 - Removal of Eligible Lamp Categories
- Draft policy covers technical requirement proposals, some implementation details are detailed in today's webinar
 - Final implementation details will be provided before the application acceptance date (tentatively April 2025)

Hort Version 4 Draft Development Timeline



The slide features a white background with a large green arrow shape pointing to the right. The arrow's outline is a thick, vibrant green. In the top-left corner, there is a small, partially visible image of green lettuce. In the bottom-right corner, there is a larger image of fresh green lettuce leaves. In the top-right corner, there is a blurred image of a sandy beach with waves breaking on the shore. The text is centered within the white area of the arrow.

Version 4.0 Baseline Requirements

Standard Requirements

Current requirements for Hort QPL listed products include

- Safety Certification
- *Warranty*
- Component lifetime
- Power Quality
- **Efficacy**

Photosynthetic Photon Efficacy ^{1,2} (K _p or PPE) ($\mu\text{mol} \times \text{J}^{-1}$)	$\geq 2.5 \mu\text{mol} \times \text{J}^{-1}$	Required/ Threshold	(ANSI/IES LM-79) 400-700 nm range
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Parameter/Attribute/Metric	Requirement	Requirement Type	Method of Measurement/Evaluation
Photon Flux Maintenance, Photosynthetic (PFM _p)	Q ₉₀ ≥36,000 hours	Required/ Threshold	(ANSI/IES LM-80 / IES TM-21 or IES LM-84 / IES TM-28) 400-700nm range, fixture technical specification sheet, and <i>In-Situ Temperature Measurement Test (ISTMT)</i>
Photon Flux Maintenance, Far-Red (PFM _{FR})	Report time to Q ₉₀	Reported	(ANSI/IES LM-80 / IES TM-21 or IES LM-84 / IES TM-28) 700-800nm range
Driver Lifetime	≥50,000 hours	Required/ Threshold	Driver technical specification sheet, fixture technical specification sheet, and <i>In-Situ Temperature Measurement Test (ISTMT)</i>
Fan Lifetime	≥50,000 hours	Required/ Threshold	Fan technical specification sheet, fixture technical specification sheet
Warranty	Fixtures: ≥5 years Lamps: ≥3 years	Required/ Threshold	Legal warranty terms & conditions
Power Factor (PF)	≥0.9	Required/ Threshold	Benchtop electrical testing or ANSI/IES LM-79
Total Harmonic Distortion, Current (THDi)	≤20%	Required/ Threshold	Benchtop electrical testing or ANSI/IES LM-79
Safety Certification	Horticultural Lighting designation by OSHA NRTL or SCC-recognized body	Required/ Threshold	ANSI/UL 8800 (ANSI/CAN/UL 8800)

Version 4.0 proposes an efficacy increase

To accelerate EE in CEA, the DLC has proposed a **Major Revision every 2 years** to drive energy efficient lighting in CEA by increasing PPE **to delist the bottom 15% of listed products**

Version 3.0 Efficacy:
2.3 $\mu\text{mol/J}$

Version 4.0 Proposed Efficacy:
2.5 $\mu\text{mol/J}$

Version 4.0 proposes an efficacy increase

PPE of Hort Listed Products



Current V3 PPE → V4 Proposed PPE



The slide features a white background with a large green arrow shape pointing to the right. The arrow's border is a vibrant green. In the top-left corner, there is a small image of a green vegetable, likely lettuce. In the top-right corner, there is a blurred image of a beach with waves. In the bottom-right corner, there is a close-up image of green lettuce leaves.

Removal of Lamp Eligibility

Removal of Lamp Eligibility

V2.1 Introduced pathways to qualify two types of horticultural lamps:

LED replacements for linear fluorescent lamps and LED replacements for mogul-based HID lamps

V4 proposes to remove all eligibility pathways for all types of horticultural lamps





Dynamically Configurable Pathways

Dynamically Configurable Listing Pathways

V2.1 Introduced pathways to list DC powered products and dynamically configurable lighting products

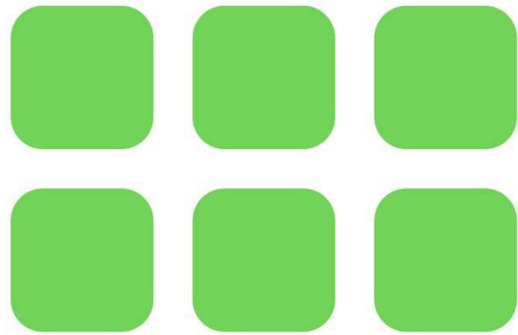
V4 proposes to relax requirements on dynamically configurable lighting products being sold as a single AC-powered fixture to allow qualify as AC- or DC-powered



Spectral Tuning Clarifications

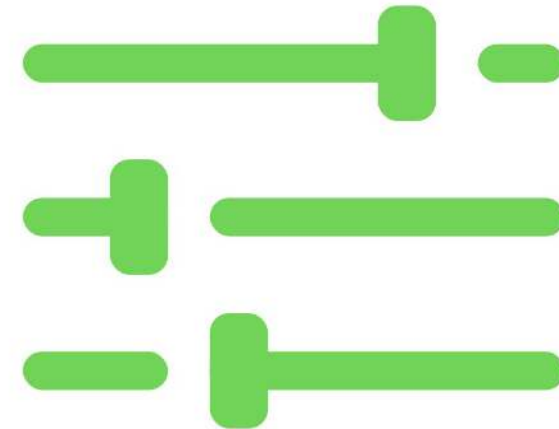


Spectral Tuning Clarification



Predefined Spectra

Tuning within a set of predefined spectral options



Customizable Spectra

Precise and dynamic control over the spectral output



Additional Clarification/Enhancements

Add'l Clarification/Enhancements

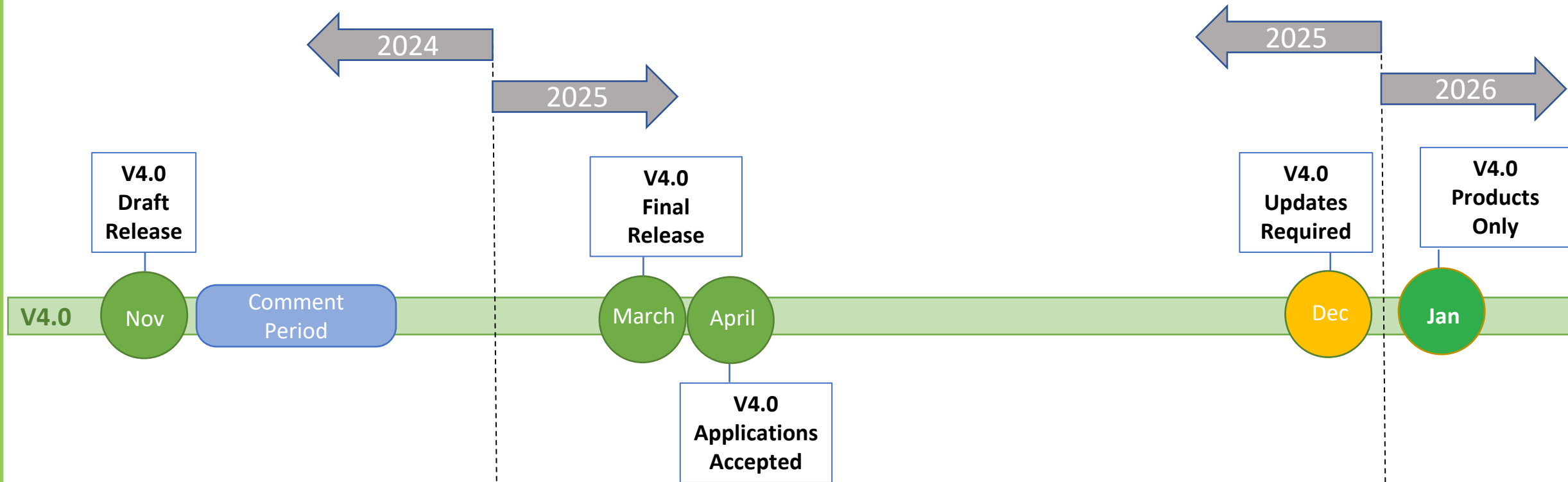
- Proposes to define "distinct color" as defined by the LED manufacturer.
 - i.e. Does not restrict LM-80 applicability claims based on manufacturing tolerances or binning options
- Proposes a +/- 15 nm limit between two distinct narrow-band emitters for LM-80 applicability claims
- Corrected language for THD_i requirement
- Supports latest revisions to industry standards
 - e.g. ANSI/IES LM-79-21 or ANSI/IES TM-33-23

V4.0 Draft Proposals Recap

Hort Version 4.0

- Version 4.0 is a major revision that proposes three key updates
 - Increase the Efficacy Threshold
 - Clarifications/Enhancements to existing technical requirements
 - Spectrally Tunable
 - Dynamically Configurable vs DC-Powered
 - LM-80 applicability for narrow-band emitters
 - Removal of Eligible Lamp Categories

Hort Version 4 Draft Development Timeline



Version 4.0 Draft Proposals

- PPE Increase to delist the bottom 15%
- Color Tuning clarifications
- Flexible pathways for Dynamically Configurable products
- Removal of Lamp pathways
- LM-80 applicability details

Hort Operations V4

Hort Operations

- **Submission Impacts**

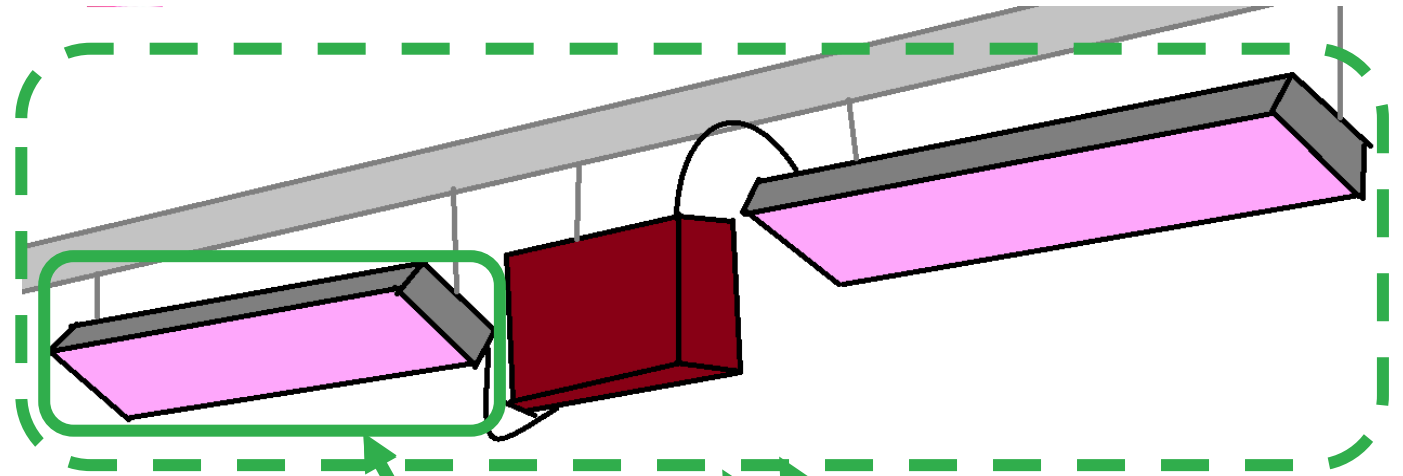
- Lamps
- AC/DC definition change
- LM-80 Applicability
- Spectrally Tunable Products

- **Lamps**

- App excel form
 - V3.0 forms will be backwards compatible
- Questionnaire
 - Changes to remove lamp questions

Submission Impact

- AC/DC Definition Change
 - V3.0 static set of components (e.g. LED Bars and driver) not rigidly connected **must submit through DC pathway**
 - V4.0 similar product types can be submitted **through AC or DC pathway**



V4.0 Can list as

- Model number rep dashed as AC **or**
- Model number rep solid as DC

V4.0 Submission Impacts

- LM-80 Applicability
 - Requirements written based on available industry consensus standards
 - Actively participating in industry standards development, reach out to participate!
- Spectrally Tunable Products
 - No change to requirements
 - Updates to help clarify the different types of spectrally tunable capability

Spectrally Tunable Example

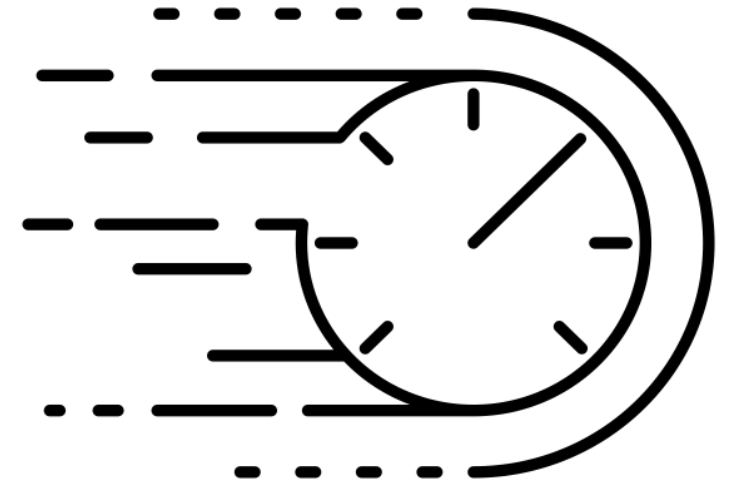
		Current/LED			
Spectral Tuning Category	Setting Displayed on QPL	White	Blue	Red	Far Red
Customizable Spectra	Max White	Max	Min	Min	Min
	Max Blue	Min	Max	Min	Min
	Max Red	Min	Min	Max	Min
	Max Far Red	Min	Min	Min	Max
Pre-defined Spectra	Roots	#	#	#	#
	Veg/Greens	#	#	#	#
	Blooms	#	#	#	#



Hort Operations Pre-V4 Expedite Pilot

Expedite Application Review Pilot

- Upcoming option for faster reviewer response not tied to V4
- \$1650 per expedited application for halved reviewer response time
- No change in requirements or review process only time allotted for reviewers to complete their part
- Select to expedite at the time of application submission
- Pilot
 - 12/1/2025 – 5/1/2025
 - Evaluate successes/failures and refine



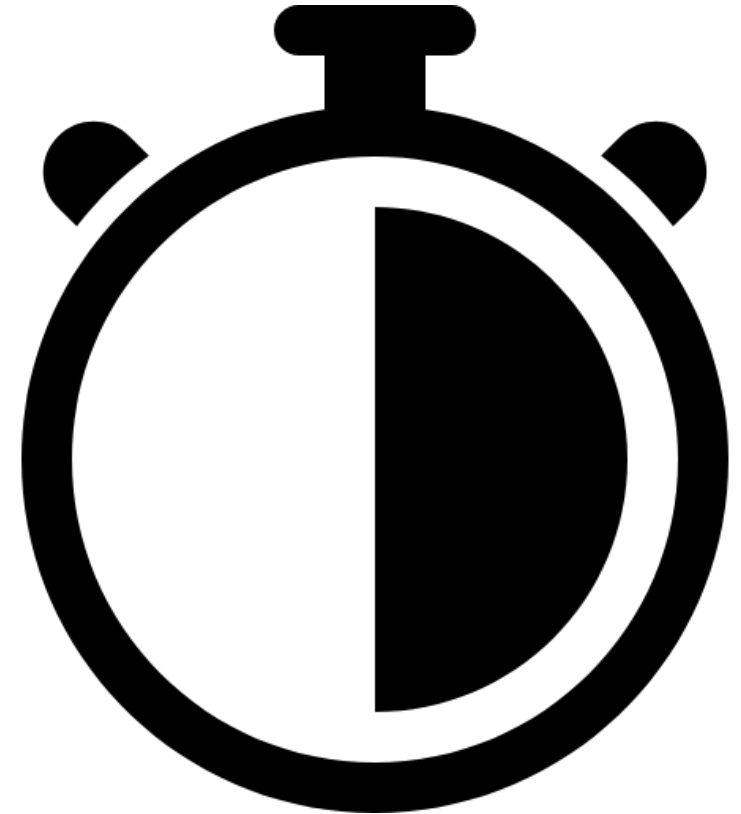
Expedite Application Review Pilot Timing

	Non-Expedite (business days)		Expedite (business days)	
Additional Fee	N/A		\$1650/application	
Application Type	Initial	Comprehensive	Initial	Comprehensive
Level 1	9	7	4	3
Level 2	9	10	4	5
Private Label	N/A	12	N/A	6
Product Update	9	10	4	5
Reviewer Response to new info/message	5		2	

- Review timing for applications to qualify DC or external actively cooled fixtures are similarly halved but not included above.

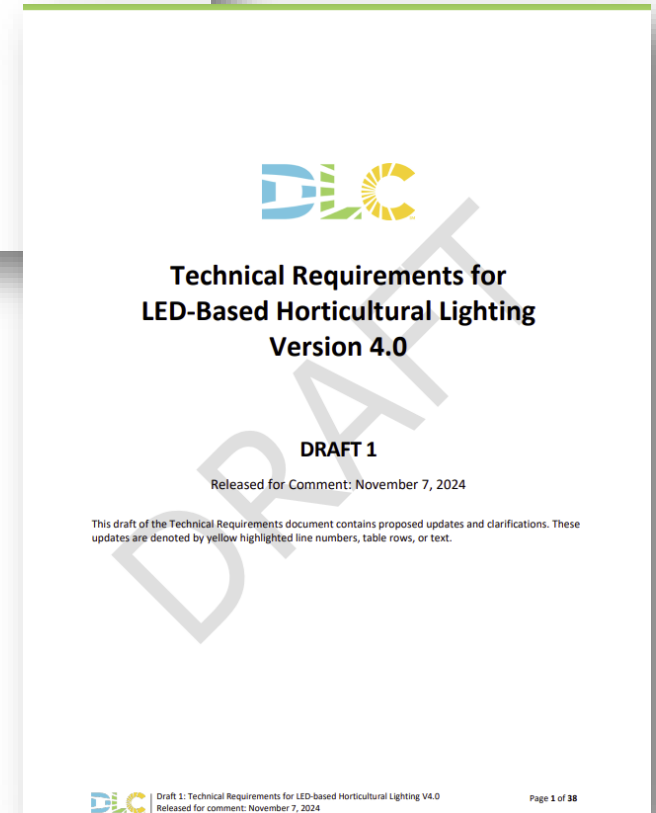
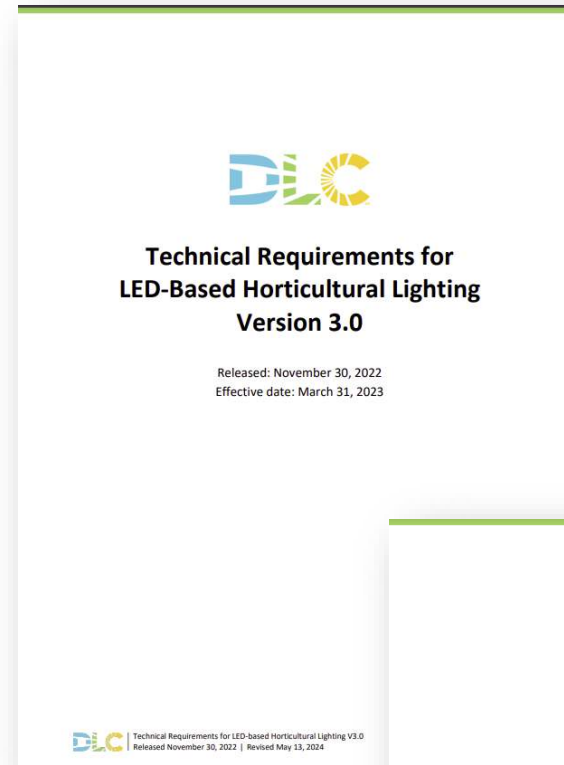
Expedite – Myths Busted!

- ~~• My applications will be completed in half the time.~~
- Application timing is based on;
 - Reviewer time to review application materials (halved)
 - Clarifying or correction of application materials
 - Lack of clarify in the product/performance
 - Specification sheet, testing, or other doc
 - Submitter time to respond to questions
 - Submitter time to pay invoices



Expedite – Myth Busted!

- ~~• Review of expedited applications is less stringent and requires less to submit.~~
- Application regardless if they are expedited or not must submit the same documentation to validate products meet the technical requirements
- No changes to the content of the submitted materials or review checks



Question and Answers

Next Steps


- Hort V4.0
 - Six-week comment period, comments due by 12/19
 - DLC will digest comments and revise draft as appropriate
 - Final Policy expected March 2025
 - V4.0 Applications starting April 2025

Thank you!

Comments are due before **December 19!**

Send completed comment forms to:

comments@designlights.org

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Reviewer Organization	Reviewer Name	Reviewer Email Address	Reviewer Phone #

Questions about applications and general inquiries should be sent to:

horticulture@designlights.org