

Final Testing and Reporting Requirements for LED-based Horticultural Lighting: Version 1.0

2018-10-03



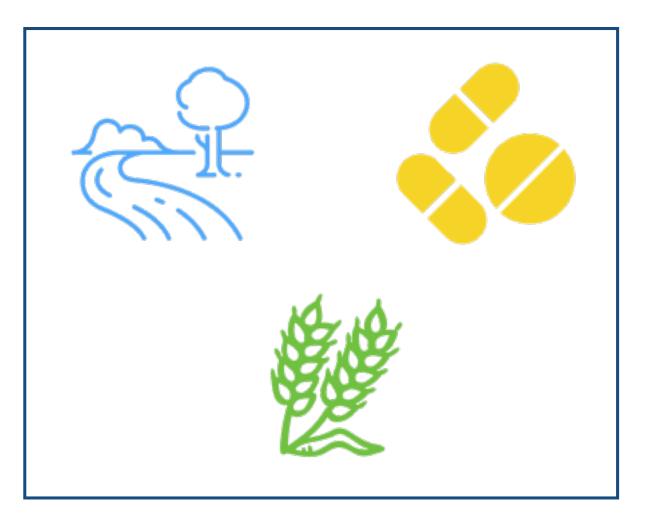
- Slides will be posted on <u>www.designlights.org</u> after presentation
- Please use the GoToWebinar Interface (Question Pane) to ask questions during today's webinar

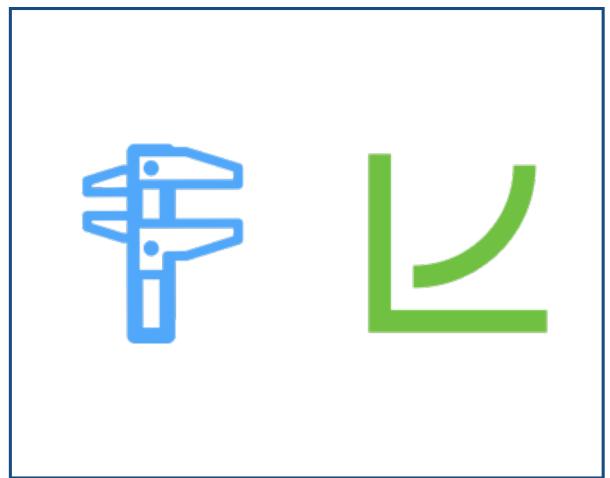
Agenda

Welcome Review of DLC & Its Development **Review Requirements** Timelines Supplemental information



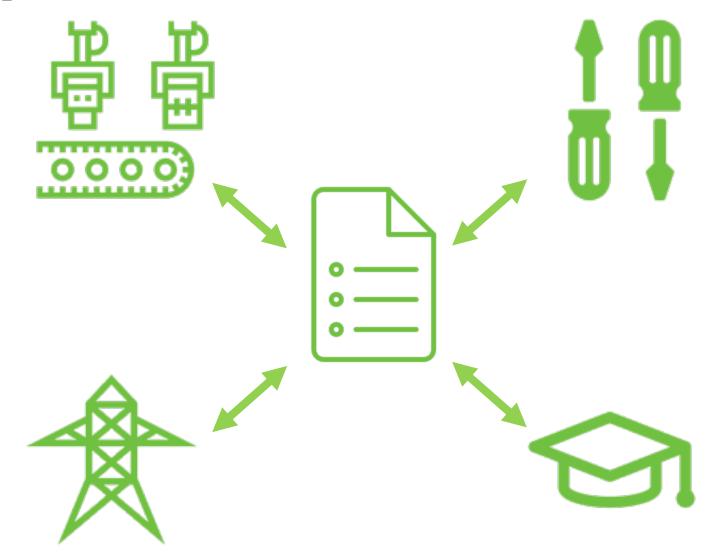
Why Horticultural Lighting?







DLC Makes Tools, Stakeholders Use Them





Stakeholder Input Is Critical

Conduct Research:

Data analysis,
Market
research,
Expert
interviews,
Technical
Assessment

Member Input:

Draft Proposals are circulated to DLC Technical Committee

Draft Policy:

TC feedback incorporated into draft policy

Stakeholder Input:

Draft policy released for Stakeholder Input

Industry Feedback:

Consider

Stakeholder input received and summarized for discussion with TC

Finalize Draft:

Revisions made based on input received from Stakeholders and TC

Release Final Policy:

Revised Spec released!



What is the Project Plan/Timeline?



- DLC stakeholder meeting sessions
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Final requirements





LED Horticultural Fixture







- PAR, as defined by ASABE ES-311 S640, is the foundation of this specification
- It is not the global solution for all plant needs!
 - But good luck trying to grow plants without it
- Our judgements focus on balancing the tension between:
 - What is the most PAR-efficacious way to produce light for the plants with SSL sources, relative to incumbent sources?
 - What is a reasonable amount of efficacy headroom to leave for ex-PAR (280-400, 700-800 nm) 'light recipes' and crop diversity?



Parameter/Attribute/Metric	Requirement	Requirement Type	Method of Measurement/Evaluation		
Photosynthetic Photon Flux (PPF), (µmol/s)	n/a	Reported	(LM-79-08) 400-700nm range, with 400- 500nm, 500-600nm, and 600-700nm bins reported alongside the total		
Far Red Photon Flux (PF _{FR}), (μmol/s)	n/a	Reported	(LM-79-08) 700-800nm range		
Spectral Quantum Distribution (SQD) (µmol/s/nm)	n/a	Reported	(LM-79-08) 400-800nm range		
Photosynthetic Photon Intensity Distribution (PPID) (µmol/s/sr)	n/a	Reported	(LM-79-08) 400-700nm range		



Parameter/Attribute/Metric	Requirement	Requirement Type	Method of Measurement/Evaluation		
Photosynthetic Photon Efficacy (PPE), (µmol/J)	≥1.9 µmol/J, with -5% tolerance	Required/Threshold	(LM-79-08) 400-700nm range		
Photosynthetic Photon Flux Maintenance, PFM _P	Q ₉₀ ≥36,000h	Required/Threshold	(LM-80-15 / TM-21 or LM-84 / TM-28) 400-700nm range		
Far Red Photon Flux Maintenance, PFM _{FR}	Report time to Q_{90}	Reported	(LM-80-15 / TM-21 or LM-84 / TM-28) 700-800nm range		



Parameter/Attribute/Metric	Requirement	Requirement Type	Method of Measurement/Evaluation
Warranty	5 years	Required/Threshold	Legal Warranty Terms & Conditions
Driver Lifetime	≥50,000 hours	Required/Threshold	Driver Technical Specification Sheet, Fixture Technical Specification Sheet, and In-Situ Temperature Measurement Test (ISTMT)
Fan Lifetime	≥50,000 hours	Required/Threshold	Fan Technical Specification Sheet, Fixture Technical Specification Sheet
Power Factor	≥0.9	Required/Threshold	Electrical testing per LM-79-08



Parameter/Attribute/Metric	Requirement	Requirement Type	Method of Measurement/Evaluation
Total Harmonic Distortion, current	≤20%	Required/Threshold	Electrical testing per LM-79-08
Safety Certification	Appropriate Horticultural Lighting designation by OSHA NRTL or SCC- recognized body	Required/Threshold	Per safety certification body



Parameter/Attribute/Metric	Requirement Requirement Type Method of Measurement/Evaluation	
Power Mode	AC line-voltage is the only approved means of powering fixtures. Future revisions may open this up to more modes, especially as we gain experience with DC / PoE in the general SSL category.	
Spectrally tunable	Test in the most consumptive single mode, then with isolated channels (CH1 = Max, all others = Min, etc). Spectral quantum distribution will be displayed in table on QPL. Special considerations exist for extrapolating flux maintenance of each channel; please refer to requirements document.	



Timelines

Short-Term Timeline

Release of requirements, applicant guidance, and supplemental topic guides

First approved fixtures begin posting to Hort QPL

18 Oct

1 Oct

28 Oct

Application portal opens, fee schedule published

We expect a significant application review backlog from already-available products, and are staffing to address this as quickly as possible. As the application queue stabilizes, we will begin publishing expected timeframes for applicants.



First-Year Timeline

- Non-PAR flux maintenance data will be accepted, with caveats, for all applications through September 2019.
 - Must explain data and conversion factors
 - Application fee will be higher, and will take longer
 - Will be listed with an asterisk (*) on the Hort QPL
 - Must update listing to PAR-based flux maintenance data, or be delisted, in April
 2020
 - If you do not have this data for your LEDs, begin testing now!
- PPID and SQD will be submitted as static images through September 2019
 - Starting in **October 2019**, TM-33-based data will be required. Static images derived from this data will be posted to the Hort QPL to respect concerns of proprietary info.
 - This XML-based reporting format promises to decrease review time and increase accuracy.



Spec Revision Cycle

Month# 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48

24-month major cycle	Versio	on 1.0				
12-month minor cycle	non-PPF LM-80 data provisionally allowed on list	only PPF LM-80 data allowed				Version 2.0
Meets V1, and V2 req'ts		85th %, need to confirm	Grace period alert	Grace period	Confirm	85th %, need to reapply
Meets V1, and V2 req'ts. No confirmation.		85th %, need to confirm	Grace period alert	Grace period	De	list



Spec Revision Cycle

10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 Month # 24-month major Version 1.0 cycle Version 2 12-month minor non-PPF LM-80 data provisionally allowed on list only PPF LM-80 data allowed cycle 15th %, Grace Meets V1 reg'ts Grace period need to Delist only. No reapply. period alert reapply 85th %, Grace 85th %, Later app, meets Grace Confirm need to period need to period V1 and V2 req'ts alert

confirm



reapply

Spec Revision Cycle

Month # 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 24-month major Version 1.0 cycle Version 2 12-month minor non-PPF LM-80 data provisionally allowed on list only PPF LM-80 data allowed cycle 15th %, Grace Grace Meets V1 reg'ts need to period Delist period only. No reapp alert reapply 15th %, Grace Later app, only V1 Grace period need to req'ts period Delist alert reapply Grace Alert for 85th %, uses non-PPF LMperiod Grace Reapply Grace Reapply provisional need to 80 data period alert period expiration reapply Alert for Grace uses non-PPF LM-Grace provisional period Delist 80 data period alert expiration



Supplemental information

What about . . .

- LM-79-08 vs. ASABE ES-311 X642?
 - Once ES-311 X642 completes its approval by ANSI, and major test labs complete accreditation to this standard, the DLC will begin requiring test reports based on this format. Applicants will receive ample notice through our email list and website alerts.



Guides posted at designlights.org

- Supplemental Guides are posted for explaining the DLC's thoughts on
 - Units of measure
 - The necessity of whole-facility application designs
 - Challenges in UV measurement
 - Externally-supplied, activelycooled fixtures

 An applicant guide is posted, explaining each section of the application in detail.



Summary

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Thank You!

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Thank you!