



Horticultural Lighting Test Report

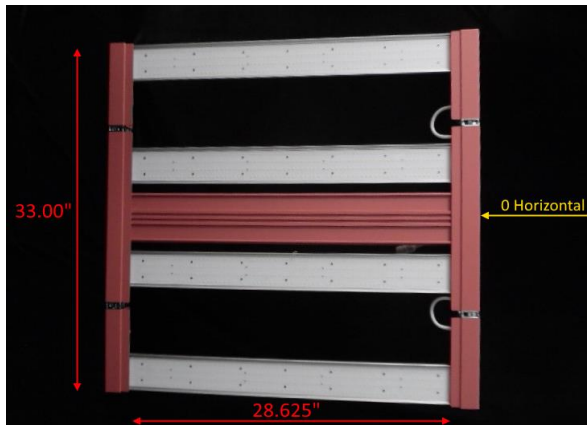
LLIA001614-003

Catalog Number: AB520

Suspended, extruded aluminum assembly with four LED light bars and one central driver compartment between two end supports, open bottom.

1120 total LEDs, 1088 white LEDs and 32 red LEDs

Two Inventronics EUM-240S670MG LED drivers



Performance Summary

Electrical

Voltage	277.0 Vac
Current	1.912 A
Power	509.2 W
Power Factor	0.961
Current THD	7.0 %

Radiometric and Quantum

Total Radiant Flux	277.79 W
Radiant Efficiency	0.546
Total Photon Flux	1265.37 $\mu\text{mol}\cdot\text{s}^{-1}$
Photon Flux Efficacy	2.485 $\mu\text{mol}\cdot\text{J}^{-1}$

Horticultural

PPF	1244.21 $\mu\text{mol}\cdot\text{s}^{-1}$
PPE	2.444 $\mu\text{mol}\cdot\text{J}^{-1}$
Far-Red Photon Flux	18.73 $\mu\text{mol}\cdot\text{s}^{-1}$
PPFD Conversion Factor	15.55 $\mu\text{mol}\cdot\text{s}^{-1}\cdot\text{m}^{-2}\cdot\text{klx}^{-1}$

Prepared For:

AB Lighting

11301 Carmel Commons Blvd

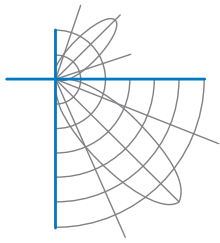
Suite 103

Charlotte, NC 28226, USA

Test date: 12/20/2021

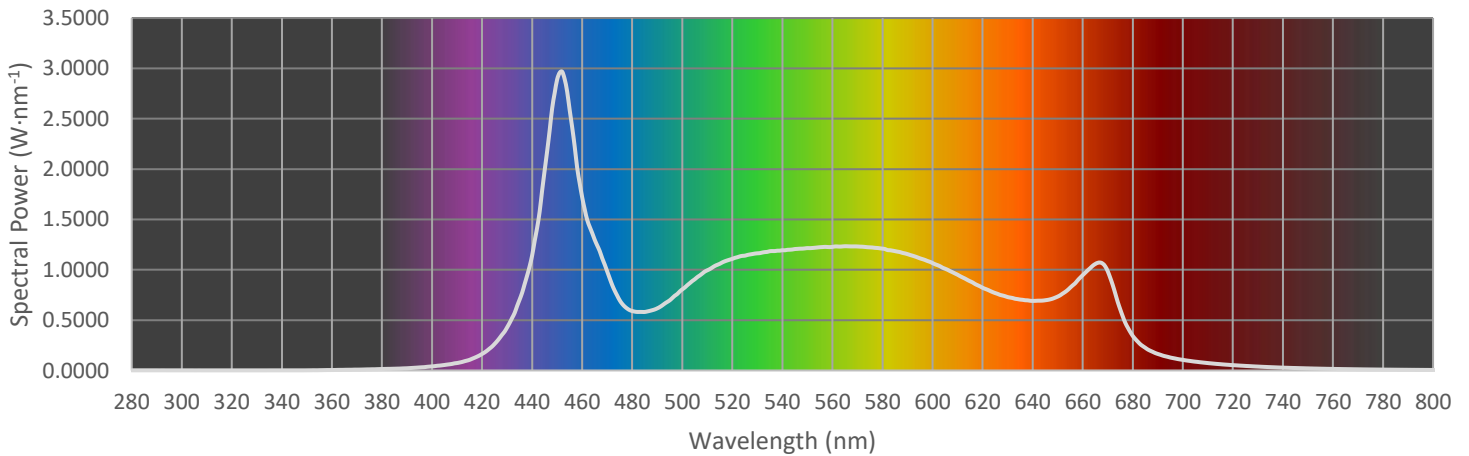
Report date: 12/23/2021

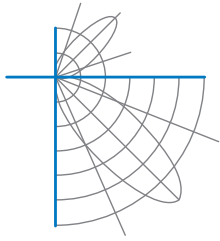
Signed: _____



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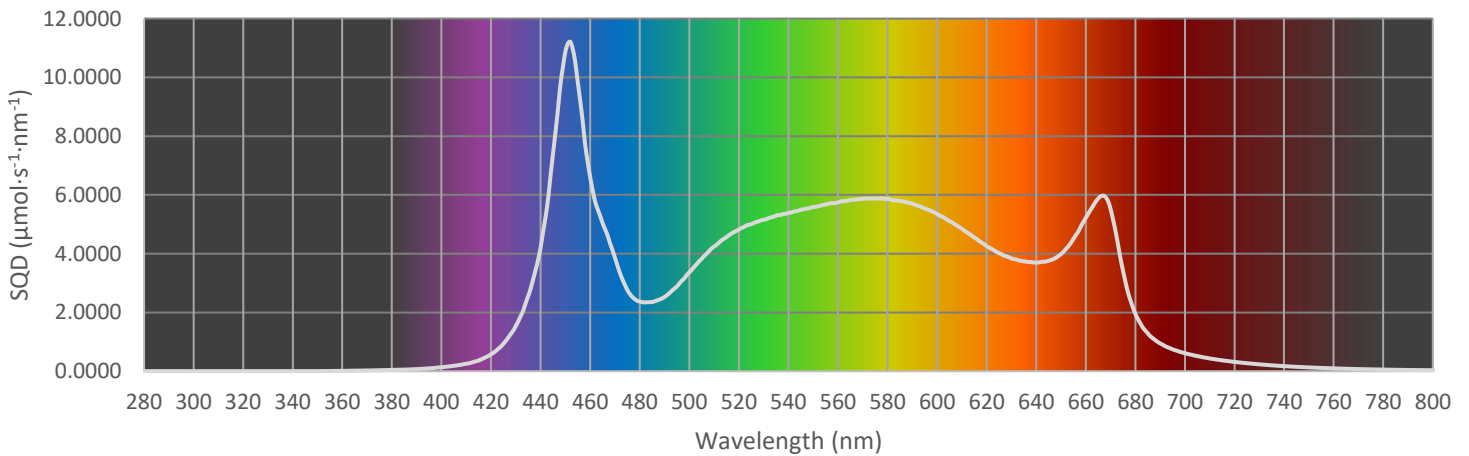
Radiant Flux Tabulation			
Waveband (nm)	Radiant Flux (W_r)	Percent of Total	Efficiency (W_r/W_e)
UV-B 280-315	0.04	0.0%	0.000
UV-A 315-400	0.73	0.3%	0.001
400-500	90.04	32.4%	0.177
500-600	114.6	41.3%	0.225
600-700	69.29	24.9%	0.136
Far-Red 700-800	3.08	1.1%	0.006
Total 280-800	277.8	100.0%	0.546
PAR 400-700	273.9	98.6%	0.538

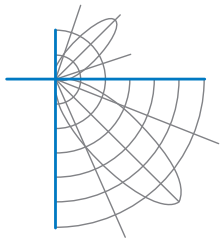




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Photon Flux Tabulation			
Waveband (nm)	Photon Flux ($\mu\text{mol}\cdot\text{s}^{-1}$)	Percent of Total (%)	Photon Flux Efficacy ($\mu\text{mol}\cdot\text{J}^{-1}$)
UV-B 280-315	0.11	0.0%	0.000
UV-A 315-400	2.32	0.2%	0.005
400-500	344.5	27.2%	0.677
500-600	528.4	41.8%	1.038
600-700	371.3	29.3%	0.729
Far-Red 700-800	18.73	1.5%	0.037
Total 280-800	1265.4	100.0%	2.485
PAR 400-700	1244.2	98.3%	2.443





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Photosynthetically Active Radiation (PAR) Metrics (400-700nm)

Photosynthetic Photon Flux (PPF)	1244.21 $\mu\text{mol}\cdot\text{s}^{-1}$
Photosynthetic Photon Efficacy (PPE)	2.444 $\mu\text{mol}\cdot\text{J}^{-1}$
Photosynthetic Photon Efficacy (PPE)	8.797 $\text{mol}\cdot\text{kWh}^{-1}$
PPFD Conversion Factor	15.55 $\mu\text{mol}\cdot\text{s}^{-1}\cdot\text{m}^{-2}\cdot\text{klx}^{-1}$

Photobiologically Active Radiation (PBAR) Metrics (280-800nm)

PBAR Flux	1265.37 $\mu\text{mol}\cdot\text{s}^{-1}$
PBAR Efficacy	2.485 $\mu\text{mol}\cdot\text{J}^{-1}$

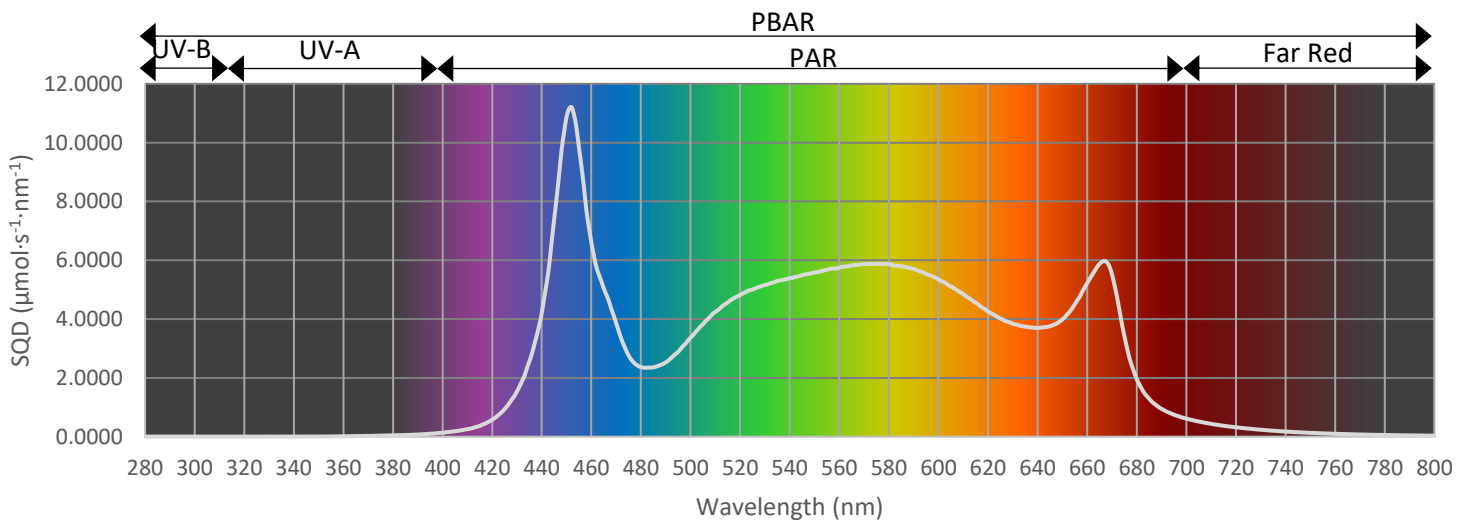
Yield Photon Flux (YPF) Metrics (Weighted 350-725nm)

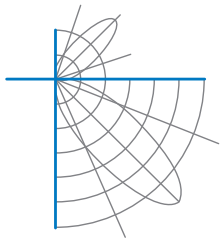
YPF	1063.30 $\mu\text{mol}\cdot\text{s}^{-1}$
YPF Efficacy	2.088 $\mu\text{mol}\cdot\text{J}^{-1}$
Yield Efficiency (YPF/PPF)	85.5 %

Red and Far-Red Flux Metrics (700-800nm)

Far-Red Photon Flux	18.73 $\mu\text{mol}\cdot\text{s}^{-1}$
Red/Far-Red Ratio (R/FR Ratio)	17.55

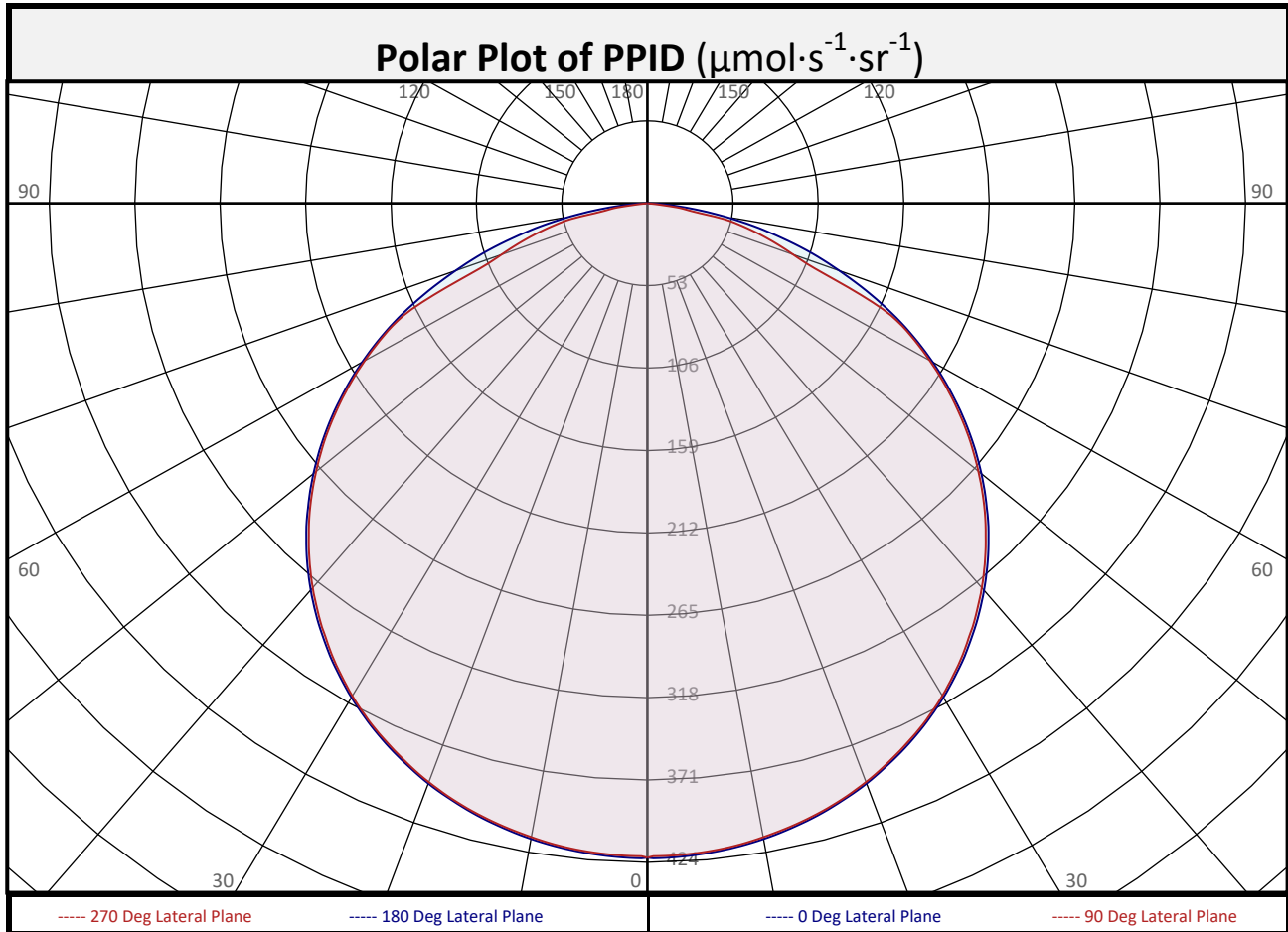
Note: for R/FR Ratio, Red Range=640-680nm, Far-Red Range=710-750nm



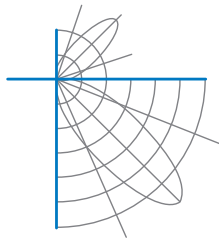


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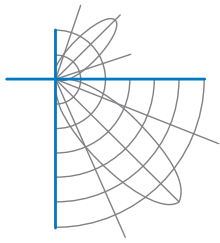
Zonal PPF Summary										
Zone (Deg Vert)	PPF ($\mu\text{mol}\cdot\text{s}^{-1}$)	Percent of Total		Zone (Deg Vert)	PPF ($\mu\text{mol}\cdot\text{s}^{-1}$)	Percent of Total		Zone (Deg Vert)	PPF ($\mu\text{mol}\cdot\text{s}^{-1}$)	Percent of Total
0-10	39.9	3.2%		90-100	0.0	0.0%		0-20	155.0	12.5%
10-20	115.1	9.3%		100-110	0.0	0.0%		0-30	331.8	26.7%
20-30	176.7	14.2%		110-120	0.0	0.0%		0-40	548.7	44.1%
30-40	217.0	17.4%		120-130	0.0	0.0%		0-60	990.5	79.6%
40-50	229.8	18.5%		130-140	0.0	0.0%		0-80	1232	99.0%
50-60	212.0	17.0%		140-150	0.0	0.0%		10-90	1204	96.8%
60-70	161.0	12.9%		150-160	0.0	0.0%		20-50	623.5	50.1%
70-80	80.2	6.4%		160-170	0.0	0.0%		40-90	695.5	55.9%
80-90	12.5	1.0%		170-180	0.0	0.0%		60-90	253.7	20.4%
0-90	1244	100.0%		90-180	0.0	0.0%		0-180	1244	100.0%



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Circle of Light Plot

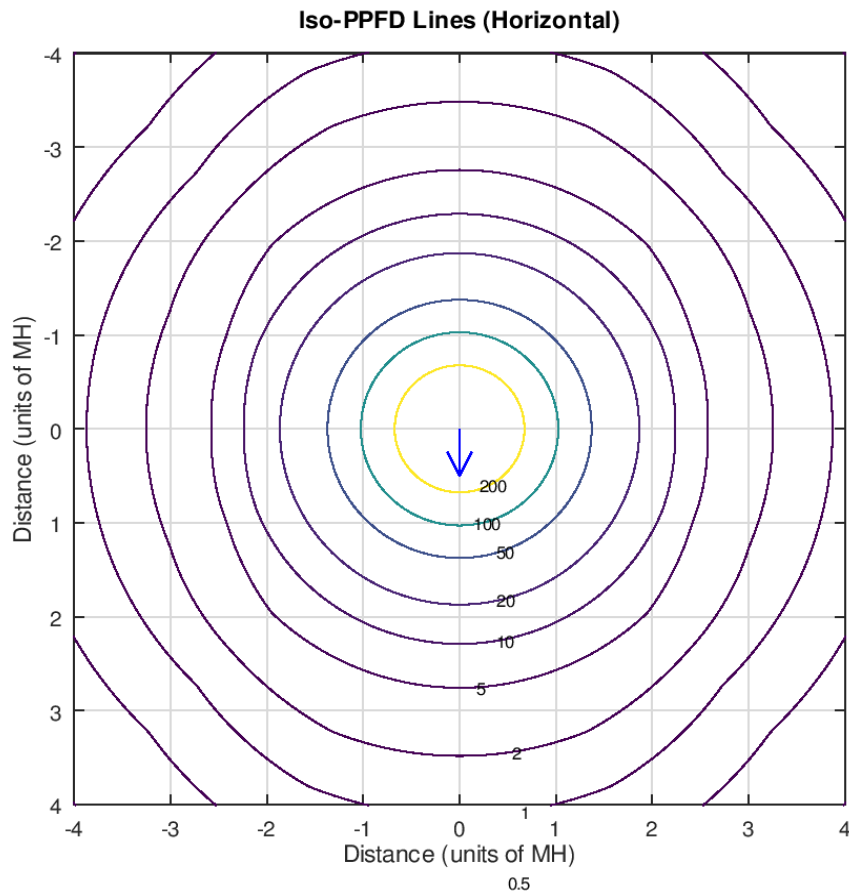
Height(m)	PPFD at Nadir ($\mu\text{mol}\cdot\text{s}^{-1}\cdot\text{m}^{-2}$)	Ground-level distance to half-of-nadir PPFD (m)	
		0-180 deg	90-270 deg
0.5	1683.9	0.65	0.65
1.0	421.0	1.30	1.29
1.5	187.1	1.94	1.94
2.0	105.2	2.59	2.58
2.5	67.4	3.24	3.23
3.0	46.8	3.89	3.87



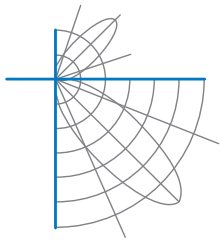
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Iso-PPFD Plot



The PPFD values shown in the plot above are based on a mounting height of $h = 1.0$ m. Grid values show multiples of mounting height. The isoilluminance contour lines are expressed in units of $\mu\text{mol}/\text{s}/\text{m}^2$. The values expressed are based on the direct light from a single unit without the contribution of room reflections.



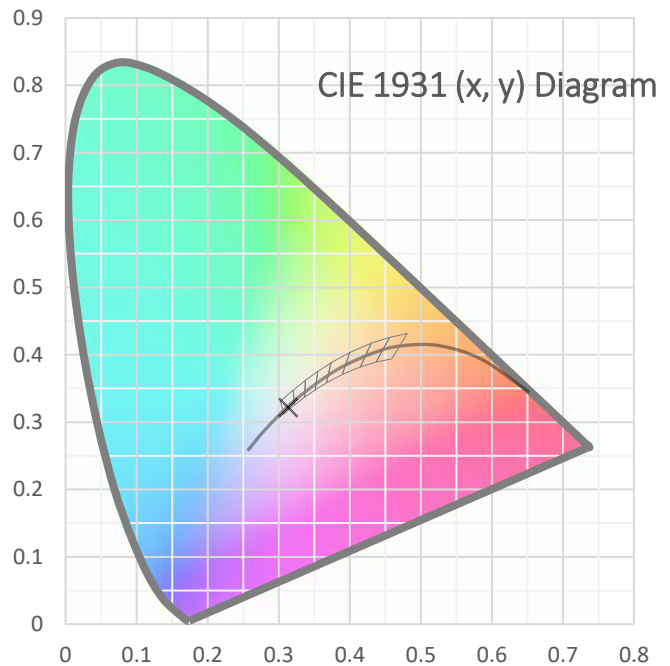
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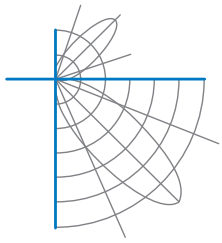
Electrical Data

Voltage	277.0 Vac
Current	1.912 A
Power	509.2 W
Frequency	59.99 Hz
Power Factor	0.961
Current THD	7.0 %

Photometric (Human Vision) Data

Total Luminous Flux	80030.5 lm
Luminous Efficacy	157.2 lm/W
Chromaticity (x,y)	(0.3138, 0.3217)
(u',v')	(0.2014, 0.4645)
Duv	-0.0012
CCT	6503 K
CRI (Ra)	86
R9	44
TM-30: Rf	82
TM-30: Rg	98





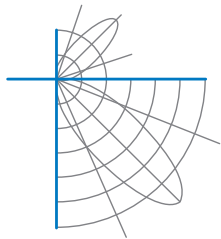
LightLab
INTERNATIONAL
ALLENTOWN LLC



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Additional Pictures of Test Subject





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Test Equipment Configuration: Measurements acquired using the LightLab International Allentown, LLC Labsphere 2m Integrating Sphere system with spectroradiometer.
Testing was performed using 4π geometry
Intensity measurements were acquired using the LightLab International Allentown, LLC goniometer with a test distance of 9.5m.

Test Temperature: 25.0 °C

Test Procedure: Tested in accordance with the applicable sections of:
LM-79-19, LM-78-20, LM-58-20, ANSI_ANSI C78.377-2017, TM-30-20

Significance: The laboratory has not participated in the selection of samples to be tested.
All testing is performed on the understanding that the significance of the report is limited to the extent that the test sample is representative of production units.

Notes: The measurements and other derived quantities contained in this report are based on the absolute data as measured.

Prorating the performance of the sample for the use of other component combinations (such as lamp / LED / Ballast / driver), or for use in different environmental conditions than that tested, may produce erroneous results.

This report is free of erasures and corrections