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LM-79-08 Test Report

For

LEDVANCE LLC

(Brand Name: LEDVANCE, SYLVANIA)

200 BALLARDVALE STREET WILMINGTON, MA 01887

Model name(s):
LEDLD2A900ST9SC3WH

Report Type: Testing and Report According to IES LM-79-2008

**Type of
Luminaire:** Downlights

Report Date: 2022-02-16
Ningbo TengLi Testing Co., Ltd

Prepared By: 2nd floor, Block B, Ningbo Testing and Certification Base,
No. 66 Qingyi Road, Ningbo National Hi-Tech Zone,
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Test & Report By:

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Review By:

Garman Mo

Manager: Garman Mo

Note: 1. The results contained in this report pertain only to the tested samples

2. This report does not imply product certification, approval, or endorsement by A2LA, or any agency of the Federal Government.



1.1 Product Information:		
Model Number	LEDLD2A900ST9SC3WH	
Remark	N/A	
Representative (Tested) Model	LEDLD2A900ST9SC3WH	
Model Difference	N/A	
SKU (if available)	N/A	
Type of Luminaire (for integral lamps, list base type and lamp type)	Downlights	
LED Manufacturer	Bridgelux, Inc	
LED Model	BXFN-27G-13H-98	
Dimming	Dimmable	
Sample Number	STD211233NB-B1	
Date of Receipt	Feb.09,2022	
Luminaire Aperture (for Downlight Retrofits)	--	in.
Luminaire Length	--	mm
Luminaires Width	--	mm
Number of Units (modular products)	N/A	s

1.2 Rated Values:	
Rated Voltage / Frequency	120Vac, 60Hz
Nominal Power	15W
Rated Initial Lamp Lumen	--
Declared CCT	2700K/3000K/3500K/4000K/5000K (Color Tunable)



1.3 Test Specifications:

Test item	<ol style="list-style-type: none">1. Total Luminous Flux2. Luminous Distribution Intensity3. Luminous Efficacy4. Correlated Color Temperature5. Color Rendering Index6. Chromaticity Coordinate7. Electrical Parameters
Reference Standard	<ol style="list-style-type: none">1. IES LM-79-2008 Electrical and Photometric Measurements of Solid-State Lighting Products2. ANSI C78.377-2015 Specifications for the Chromaticity of Solid State Lighting Products3. CIE 13.3-1995 Method of Measuring and Specifying Colour Rendering Properties of Light Sources4. CIE 15-2004 Technical Report Colorimetry5. IESNA LM-16-93 Practical Guide to Colorimetry of Light Source

1.4 Test Methods

1) Photometric and Light Distribution Measurement – Goniophotometer Method:

Photometric parameters were measured using the goniophotometer and software. The ambient temperature shall be maintained at $25^{\circ}\text{C} \pm 1^{\circ}\text{C}$, measured at a point not more than 1 m from the sample and at the same height as the sample. The sample was operated at 120 or rated Volts AC, 60Hz. It was stabilized before measurement was made. Luminous flux, luminaire efficacy, zonal lumen were calculated from the software taken at 1° vertical intervals and 22.5° horizontal intervals.

2) Chromaticity Measurement – Sphere-Spectroradiometer Method:

Chromaticity parameters were measured using an integrating sphere, a spectroradiometer and software. The ambient temperature condition inside the sphere was maintained at $25^{\circ}\text{C} \pm 1^{\circ}\text{C}$. The sample measurements were made using a spectroradiometer connected by a fiber optic cable and detector through the detector port of the integrating sphere. The sample was operated at 120 or rated Volts AC, 60Hz. It was stabilized before measurement was made. Chromaticity coordinates, correlated color temperature and color rendering index were calculated from the spectral power distribution taken at 5 nm intervals over the range of 380 to 780 nm.

3) Electrical Measurements:

Electrical parameters were measured using power meters incorporated in goniophotometer or sphere-spectroradiometer system. The ambient temperature surrounding the sample was maintained at $25^{\circ}\text{C} \pm 1^{\circ}\text{C}$. The sample was operated at 120 or rated Volts AC, 60Hz. It was stabilized before measurement was made. Voltage, frequency, current, power, power factor and total harmonic distortion were measured by and read from the power meter.



2.1.1 Electrical, Photometric and Chromaticity Measurements

Test date	2022-02-10	Test Ambient:	25±1 °C
Test Orientation	As intended	Stabilization Time (min)	45
Model Number	LEDLD2A900ST9SC3WH /2700K setting	Total Operating Time(min)	55

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
STD211233 NB-B1	120.0	60	0.1376	14.98	0.9074

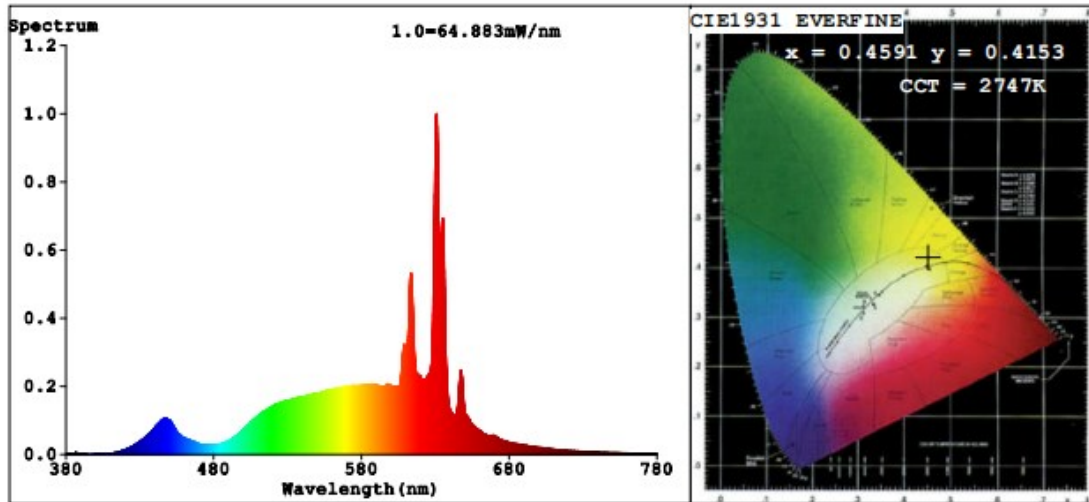
Chromaticity Measurement - Sphere-Spectroradiometer Method: (Self-absorption:1.0225)(4 π geometry):

Parameter	Result
Test Voltage (V)	120
Frequency (Hz)	60
CCT (K)	2747
Duv	0.0018
Chromaticity (x, y)	x=0.4591 y=0.4153
Chromaticity (u', v')	u'=0.2599 v'=0.5290
Color Rendering Index (CRI)	92.9
R9	73

Photometric Measurement – Goniophotometer Method:

Parameter	Result
Test Voltage (V)	120
Frequency (Hz)	60
Total Luminous (lm)	944.91
Luminous Efficacy (lm/W)	63.08
Beam Angle (°)	108.4
Center Beam Candle Power (cd)	330

Spectral Power Distribution & Chromaticity Diagram



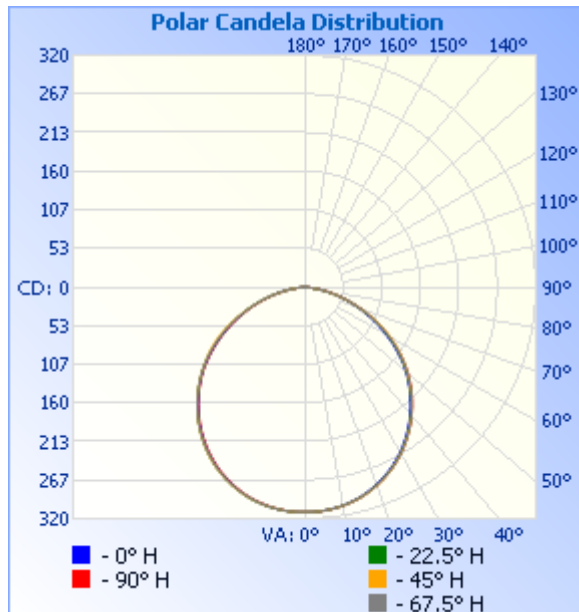
R1 =97 R2 =94 R3 =87 R4 =93 R5 =94 R6 =93 R7 =94
R8 =91 R9 =73 R10=81 R11=93 R12=78 R13=95 R14=91 R15=93

Zonal Lumen Tabulation

Zonal Lumen Summary		
Zone	Lumens	%Luminaire
0-30	253.0	26.8%
0-40	411.0	43.5%
0-60	716.2	75.8%
60-90	217.4	23%
70-100	111.7	11.8%
90-120	7.4	0.8%
0-90	933.5	98.8%
90-180	11.3	1.2%
0-180	944.8	100%

Lumens Per Zone					
Zone	Lumens	%Total	Zone	Lumens	%Total
0-10	31.2	3.3%	90-100	6.0	0.6%
10-20	88.8	9.4%	100-110	0.7	0.1%
20-30	133.1	14.1%	110-120	0.7	0.1%
30-40	158.0	16.7%	120-130	0.8	0.1%
40-50	161.1	17.1%	130-140	1.2	0.1%
50-60	144.1	15.2%	140-150	0.8	0.1%
60-70	111.7	11.8%	150-160	0.6	0.1%
70-80	71.5	7.6%	160-170	0.4	0%
80-90	34.1	3.6%	170-180	0.1	0%

Photometric Data



Illuminance at a Distance

	Center Beam fc	Beam Width
17.0ft	1.08 fc	49.6 ft 50.0 ft
34.0ft	0.27 fc	99.2 ft 99.9 ft
51.0ft	0.12 fc	148.9 ft 149.9 ft
68.0ft	0.07 fc	198.5 ft 199.8 ft
85.0ft	0.04 fc	248.1 ft 249.8 ft
102.0ft	0.03 fc	297.7 ft 299.8 ft

■ Vert. Spread: 111.2°
■ Horiz. Spread: 111.5°

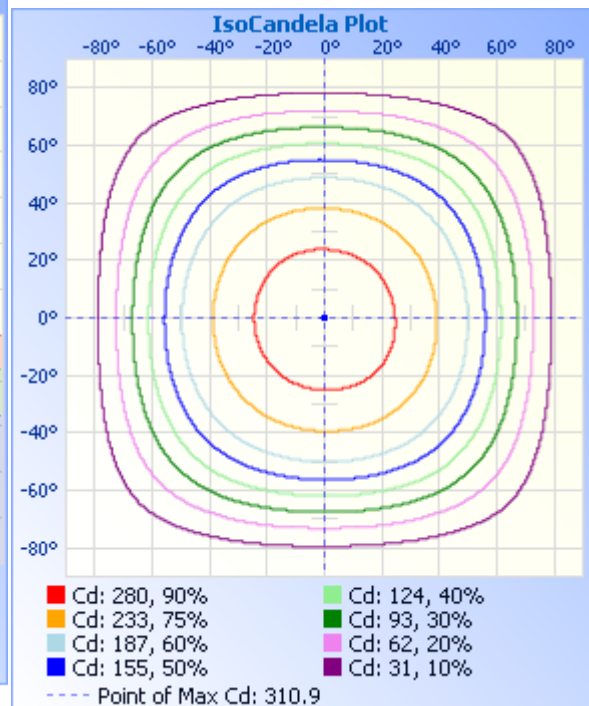
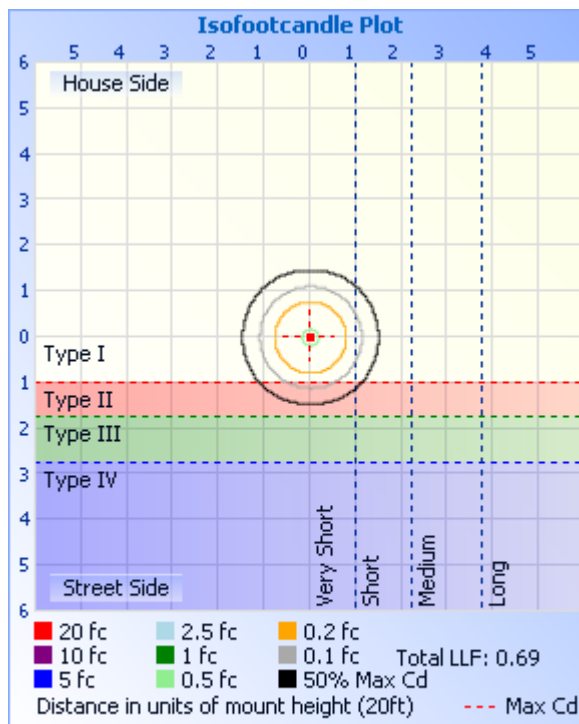




Table--1

UNIT: °C

γ (DEG)	0	22.5	45	67.5	90	112.5	135	157.5	180	202.5	225	247.5	270	292.5	315	337.5			
0	330	330	330	330	330	330	330	330	330	330	330	330	330	330	330	330			
5	327	327	327	327	328	328	329	329	330	330	329	329	329	328	328	327			
10	321	320	321	322	322	323	324	325	326	326	326	325	324	323	322	321			
15	311	311	311	312	314	315	316	317	319	319	318	317	316	314	313	312			
20	298	298	299	300	302	304	305	307	308	309	308	307	305	303	301	300			
25	283	283	283	285	287	289	292	293	295	295	294	293	291	288	286	284			
30	265	265	266	267	270	272	275	277	279	279	278	276	274	271	269	267			
35	245	245	246	248	250	253	256	258	260	261	259	257	255	252	249	247			
40	223	223	224	226	229	232	235	237	240	240	239	236	234	231	228	226			
45	201	201	202	204	207	210	213	215	218	218	216	214	211	208	205	203			
50	177	177	178	180	183	186	189	191	194	194	193	190	187	184	181	179			
55	153	153	154	156	159	162	165	167	170	170	168	166	163	160	157	155			
60	129	129	130	132	135	138	141	143	145	145	144	141	138	136	133	131			
65	105	105	106	108	111	114	117	118	121	120	119	117	114	111	109	107			
70	82.3	82.4	83.5	85.3	87.8	90.6	93.1	94.8	96.8	96.5	95.2	93.1	90.6	88.2	86.0	84.3			
75	61.1	61.3	62.3	63.9	66.1	68.6	70.8	72.3	73.9	73.6	72.3	70.4	68.2	66.1	64.2	62.8			
80	42.4	42.5	43.3	44.7	46.6	48.7	50.5	51.8	53.1	52.8	51.7	50.0	48.1	46.4	44.9	43.8			
85	26.6	26.7	27.4	28.4	30.0	31.7	33.2	34.1	35.0	34.8	33.9	32.4	30.9	29.6	28.6	27.7			
90	14.7	14.7	15.2	15.9	16.9	18.1	19.0	19.6	20.6	20.4	19.7	18.5	17.5	16.6	16.0	15.5			
95	1.17	2.57	0.06	7.80	1.85	8.16	0.03	2.19	1.84	0.18	0.00	0.83	0.31	2.88	0.00	0.00			
100	0.31	0.39	0.03	2.45	2.97	2.78	0.03	0.11	0.17	0.08	1.97	3.49	3.36	3.05	0.80	0.14			
105	0.94	0.81	0.18	0.06	0.03	0.04	0.22	1.44	1.69	0.99	0.13	0.05	0.39	0.04	0.15	0.87			
110	0.72	0.54	0.38	0.19	0.27	0.28	0.58	1.16	1.05	0.91	0.25	0.19	0.25	0.23	0.26	0.86			
115	0.78	0.59	0.53	0.40	0.15	0.54	1.03	1.21	1.14	0.85	0.67	0.28	0.02	0.35	0.79	1.01			
120	0.96	0.73	0.68	0.30	0.62	0.60	1.34	1.37	1.22	1.01	0.65	0.44	0.37	0.87	1.20	1.20			
125	1.16	0.88	0.84	0.23	0.77	0.57	1.54	1.41	1.14	0.94	0.74	0.14	0.62	0.32	1.60	1.47			
130	1.37	1.04	0.99	1.10	1.06	0.54	1.94	1.67	1.39	1.04	0.78	0.65	0.98	0.61	1.85	1.68			
135	1.78	1.18	0.56	1.38	1.35	3.79	2.13	1.87	1.59	1.33	0.53	1.05	1.45	3.80	1.62	1.93			
140	1.65	1.04	0.59	1.49	2.13	2.18	1.71	2.00	1.94	1.44	0.65	1.13	1.39	2.58	2.00	3.03			
145	1.13	0.83	0.78	1.61	1.44	2.19	0.28	1.86	1.42	1.09	0.31	1.35	0.41	1.84	0.47	1.52			
150	0.77	0.32	0.73	1.97	1.54	2.16	0.53	1.78	3.28	1.06	0.82	0.55	0.49	0.33	1.20	0.55			
155	0.82	0.80	0.88	0.92	3.18	3.55	1.77	0.45	0.62	0.66	1.37	1.77	0.61	0.38	2.08	1.58			
160	1.70	1.52	0.38	0.99	1.10	1.80	0.58	0.84	1.69	1.64	1.76	1.73	0.89	1.32	1.73	1.66			
165	1.18	1.58	0.42	0.70	0.59	0.44	0.60	0.83	1.76	1.87	2.34	1.60	1.10	2.07	3.53	2.73			
170	0.95	1.44	0.85	0.13	0.67	1.23	2.13	0.86	1.49	1.52	1.55	1.37	0.95	1.35	1.27	1.19			
175	0.87	0.75	0.40	0.63	0.77	0.98	0.73	0.43	0.62	0.64	0.81	0.84	0.55	0.89	0.92	0.83			
180	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			



2.1.2 Electrical, Photometric and Chromaticity Measurements	IES LM-79 2008
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Test date	2022-02-10	Test Ambient:	25±1 °C
Test Orientation	As intended	Stabilization Time (min)	45
Model Number	LEDLD2A900ST9SC3WH /3000K setting	Total Operating Time(min)	55

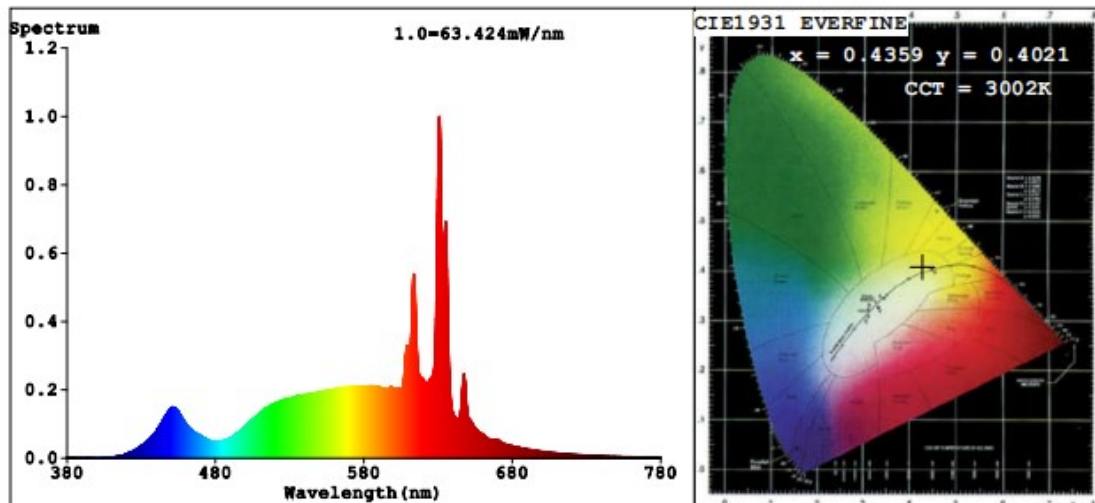
Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
STD211233 NB-B1	120.0	60	0.1357	14.83	0.9106

Sphere-Spectroradiometer Method: (Self-absorption:1.0226)(4 π geometry):

Parameter	Result
Test Voltage (V)	120
Frequency (Hz)	60
CCT (K)	3002
Duv	-0.0006
Chromaticity (x, y)	x=0.4359 y=0.4021
Chromaticity (u', v')	u'=0.2507 v'=0.5204
Color Rendering Index (CRI)	95.6
R9	84
Total Luminous (lm)	983.0
Luminous Efficacy (lm/W)	66.28

Spectral Power Distribution and Chromaticity Diagram



R1 =100	R2 =96	R3 =90	R4 =94	R5 =98	R6 =96	R7 =96
R8 =95	R9 =84	R10=88	R11=93	R12=82	R13=99	R14=92 R15=98



2.1.3 Electrical, Photometric and Chromaticity Measurements	IES LM-79 2008
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Test date	2022-02-10	Test Ambient:	25±1 °C
Test Orientation	As intended	Stabilization Time (min)	45
Model Number	LEDLD2A900ST9SC3WH /3500K setting	Total Operating Time(min)	55

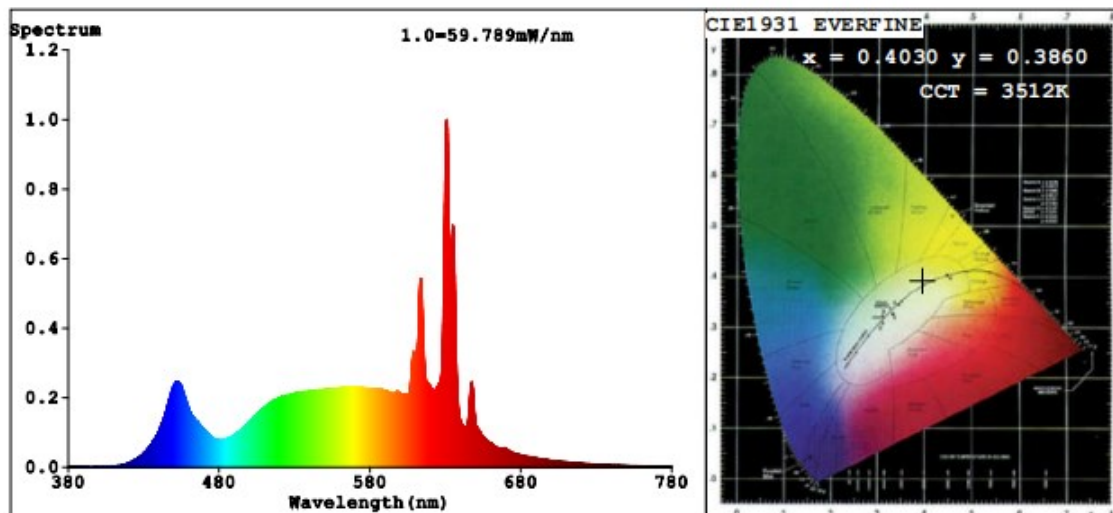
Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
STD211233 NB-B1	120.0	60	0.1338	14.70	0.9155

Sphere-Spectroradiometer Method: (Self-absorption:1.0227)(4 π geometry):

Parameter	Result
Test Voltage (V)	120
Frequency (Hz)	60
CCT (K)	3512
Duv	-0.0016
Chromaticity (x, y)	x=0.4030 y=0.3860
Chromaticity (u', v')	u'=0.2362 v'=0.5089
Color Rendering Index (CRI)	96.6
R9	94
Total Luminous (lm)	1038.0
Luminous Efficacy (lm/W)	70.60

Spectral Power Distribution and Chromaticity Diagram



R1 =98	R2 =98	R3 =91	R4 =95	R5 =100	R6 =96	R7 =97
R8 =99	R9 =94	R10=91	R11=92	R12=80	R13=99	R14=93 R15=99



2.1.4 Electrical, Photometric and Chromaticity Measurements	IES LM-79 2008
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Test date	2022-02-10	Test Ambient:	25±1 ° C
Test Orientation	As intended	Stabilization Time (min)	45
Model Number	LEDLD2A900ST9SC3WH /4000K setting	Total Operating Time(min)	55

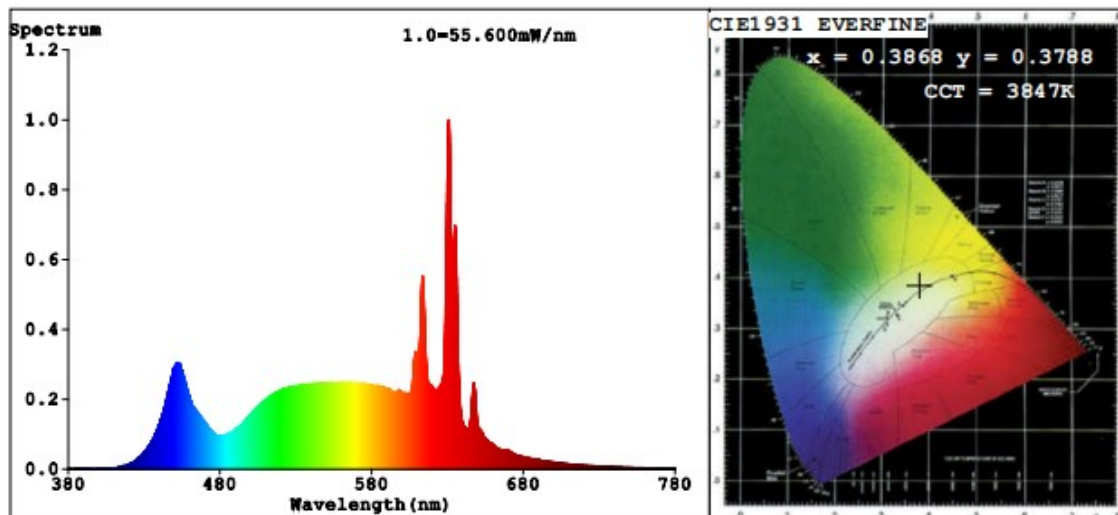
Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
STD211233 NB-B1	120.0	60	0.1333	14.68	0.9176

Sphere-Spectroradiometer Method: (Self-absorption:1.0228)(4 π geometry):

Parameter	Result
Test Voltage (V)	120
Frequency (Hz)	60
CCT (K)	3847
Duv	-0.0008
Chromaticity (x, y)	x=0.3868 y=0.3788
Chromaticity (u', v')	u'=0.2284 v'=0.5034
Color Rendering Index (CRI)	96.7
R9	96
Total Luminous (lm)	1041.0
Luminous Efficacy (lm/W)	70.91

Spectral Power Distribution and Chromaticity Diagram



R1 =98	R2 =98	R3 =91	R4 =96	R5 =99	R6 =95	R7 =98
R8 =99	R9 =96	R10=91	R11=93	R12=77	R13=99	R14=93 R15=98



2.1.5 Electrical, Photometric and Chromaticity Measurements	IES LM-79 2008
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Test date	2022-02-10	Test Ambient:	25±1 °C
Test Orientation	As intended	Stabilization Time (min)	45
Model Number	LEDLD2A900ST9SC3WH /5000K setting	Total Operating Time(min)	55

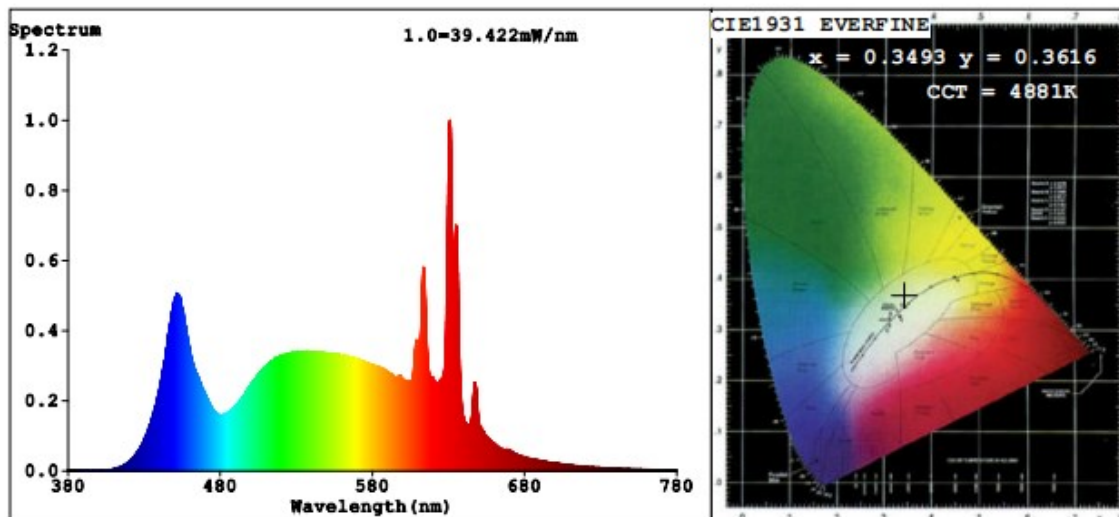
Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
STD211233 NB-B1	120.0	60	0.1360	14.85	0.9099

Sphere-Spectroradiometer Method: (Self-absorption:1.0229)(4 π geometry):

Parameter	Result
Test Voltage (V)	120
Frequency (Hz)	60
CCT (K)	4881
Duv	0.0033
Chromaticity (x, y)	x=0.3493 y=0.3616
Chromaticity (u', v')	u'=0.2104 v'=0.4901
Color Rendering Index (CRI)	95.0
R9	85
Total Luminous (lm)	964.0
Luminous Efficacy (lm/W)	64.91

Spectral Power Distribution and Chromaticity Diagram



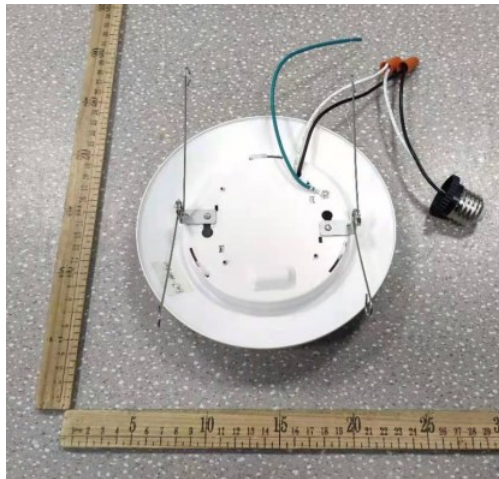
R1 =97	R2 =95	R3 =91	R4 =96	R5 =94	R6 =92	R7 =98
R8 =96	R9 =85	R10=85	R11=94	R12=69	R13=96	R14=94 R15=95



3. Test Equipment

Equipment ID	Equipment Name	Last Calibration Date	Next Calibration Date
ST-R-702	2 meter Integrating Sphere	Verified by D204 standard lamp	
ST-R-701	Spectral analysis system HAAS-1200	Verified by D204 standard lamp	
ST-R-703	Standard Lamp D204	2022-01-14	2023-01-13
ST-R-704	Power Meter for Integrating Sphere	2022-01-03	2023-01-02
ST-R-714	Goniophotometer system	Verified by D908S standard lamp	
ST-R-710	Standard Lamp D908S	2022-01-14	2023-01-13
ST-R-711	Power Meter for Goniophotometer	2022-01-03	2023-01-02
Uncertainty(K=2): Photometric Measurement (Sphere):3.94% Chromaticity Measurement(Sphere):48.2K Photometric Measurement(Goniophotometer):3.96%			

4. Product Photo



***** END OF REPORT *****