



REPORT

25800 COMMERCENTRE DRIVE, LAKE FOREST, CA 92630

Project No. G102406056

Date: June 15, 2016

REPORT NO. 102406056LAX-079

TEST OF ONE LED LAMP

MODEL NO. SP20-11-25D-827-03

LED MODEL NO. SORAA

DRIVER MODEL NO. SORAA

RENDERED TO

SORAA

6500 KAISER DR. SUITE 110

FREMONT, CA 94555

TEST: Electrical and Photometric tests as required to the IESNA test standard.

STATEMENT OF LIMITATION: This report must not be used by the client to claim product certification, approval, or endorsement by A2LA, NIST, or any agency of the federal government.

AUTHORIZATION: The testing performed was authorized by signed quote number Qu-00660665.

STANDARDS USED: The following American National Standards or Illuminating Engineering Society of North America Test Guides were used in part or totally to test each specimen:

IESNA LM-79 - 2008: Electrical and Photometric Measurements of Solid State Lighting

DESCRIPTION OF SAMPLE: The client submitted one production sample of model number SP20-11-25D-827-03. The sample was received by Intertek on June 15, 2016, in undamaged condition and one sample was tested as received. The sample designation was LAN1606150659-002.

DATES OF TESTS: June 10, 2016

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SUMMARY

Model No.:	SP20-11-25D-827-03
Description:	LED LAMP

Criteria	Result	
	Sphere	Goniometer
Total Lumen Output (Lumens)	742.6	747.9
Total Power (W)	10.52	10.50
Luminaire Efficacy (LPW)	70.59	71.23

Criteria	Result
Power Factor	0.947
Current ATHD %	31.39
Correlated Color Temperature (CCT - K)	2639
Color Rendering Index (CRI - Ra)	83.2
Color Rendering Index (CRI - R9)	9.3
DUV	0.001
Chromaticity Coordinate (x)	0.463
Chromaticity Coordinate (y)	0.408
Chromaticity Coordinate (u')	0.266
Chromaticity Coordinate (v')	0.527

EQUIPMENT LIST

Equipment Used	Model Number	Control Number	Last Date Calibrate d	Calibration Due Date	Date Used
LapSphere 2M Integrating Sphere	LMS760	000835	05/18/16	06/18/16	06/10/16
LabSphere Spectrometer	CDS-3020	000838	05/18/16	06/18/16	06/10/16
California Instruments Power Supply	CSW5550	001339	VBU	VBU	06/10/16
Yokogawa Power Meter	WT210	000912	04/30/16	04/30/17	06/10/16
Extech Instruments Stop Watch	365510	001379	11/19/15	11/19/16	06/10/16
Temp & HR Meter	971	001178	12/18/15	12/18/16	06/10/16
LSI High Speed Mirror Goniometer	6440T	000943	05/11/16	06/11/16	06/10/16
Elgar Power Supply	CW1251	000944	VBU	VBU	06/10/16
Yokogawa Power Analyzer	WT210	000945	12/04/15	12/04/16	06/10/16
Tape Measure	C1-25	000915	12/04/15	12/04/16	06/10/16



TEST METHODS

Seasoning in Sample Orientation – LED Products

No seasoning was performed in accordance with IESNA LM-79.

Photometric and Electrical Measurements – Integrating Sphere Method

A Labsphere CDS 3020 Spectrometer and Three Meter Sphere was used to measure correlated color temperature, chromaticity coordinates, and the color rendering index for each SSL unit.

Ambient temperature was measured at a position inside the sphere. Each SSL unit was operated on the client provided driver at the rated input voltage in its designated orientation. Each SSL unit was allowed to stabilize for at least thirty minutes before measurements were made. Electrical measurements including voltage, current, and power were measured using the Yokogawa Power Analyzer.

The calibration of the sphere spectrometer system is traceable to the National Institute of Standards and Technology.

Photometric and Electrical Measurements – Distribution Method

A LSI Type C High Speed Model 6440 Mirror Goniometer was used to measure the intensity (candelas) at each angle of distribution for each sample.

Ambient temperature was measured equal to the height of the sample mounted on the Goniometer equipment. Each sample was operated at input rated voltage in its designated orientation. Each sample was allowed to stabilize for at least thirty minutes before measurements were made. Electrical measurements including voltage, current, and power were measured using the Yokogawa Power Analyzer.

Some graphics were created with Photometrics Plus software.



RESULTS OF TEST

Photometric and Electrical Measurements at Ambient Temperature (25°C +/- 1°C) - Integrating Sphere Method

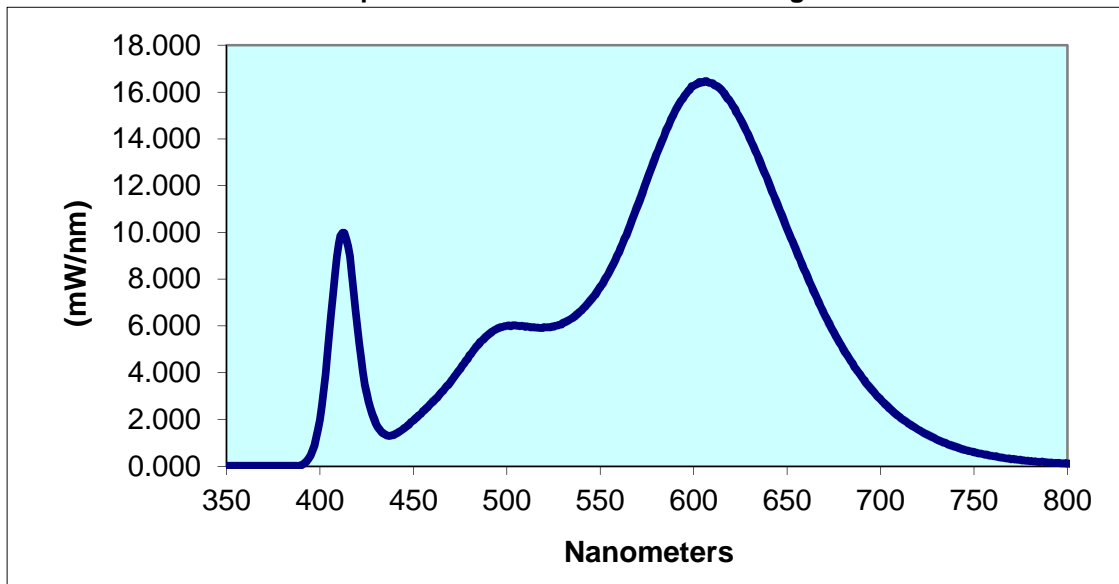
Intertek Sample No.	Base Orientation	Input Voltage {Vac}	Input Current (mA)	Input Power (Watts)	Input Power Factor	Current ATHD (%)	Luminous Flux (Lumens)	Lumen Efficacy (LPW)
LAN1606150659-002	UP	120.0	92.52	10.52	0.947	31.39	742.6	70.59

Correlated Color Temperature (K)	CRI -Ra	CRI -R9	DUV	CIE 31' Chromaticity Coordinate (x)	CIE 31' Chromaticity Coordinate (y)	CIE 76' Chromaticity Coordinate (u')	CIE 76' Chromaticity Coordinate (v')
2639	83.2	9.3	0.001	0.463	0.408	0.266	0.527

Spectral Distribution over Visible Wavelengths

nm	mW/nm	nm	mW/nm	nm	mW/nm	nm	mW/nm	nm	mW/nm
350	0.006	440	1.360	530	6.126	620	15.550	710	2.115
355	0.006	445	1.622	535	6.332	625	14.840	715	1.824
360	0.006	450	1.955	540	6.666	630	14.030	720	1.574
365	0.006	455	2.342	545	7.116	635	13.110	725	1.356
370	0.006	460	2.729	550	7.659	640	12.150	730	1.148
375	0.006	465	3.154	555	8.337	645	11.150	735	0.978
380	0.006	470	3.610	560	9.158	650	10.160	740	0.827
385	0.006	475	4.149	565	10.110	655	9.204	745	0.701
390	0.037	480	4.731	570	11.140	660	8.256	750	0.595
395	0.463	485	5.228	575	12.240	665	7.343	755	0.512
400	1.986	490	5.624	580	13.320	670	6.482	760	0.431
405	5.651	495	5.890	585	14.330	675	5.725	765	0.368
410	9.523	500	6.002	590	15.180	680	5.017	770	0.297
415	9.411	505	6.018	595	15.830	685	4.385	775	0.264
420	5.969	510	5.970	600	16.260	690	3.796	780	0.215
425	3.144	515	5.940	605	16.430	695	3.302		
430	1.821	520	5.946	610	16.380	700	2.866		
435	1.350	525	5.963	615	16.080	705	2.456		

Spectral Data Over Visible Wavelengths



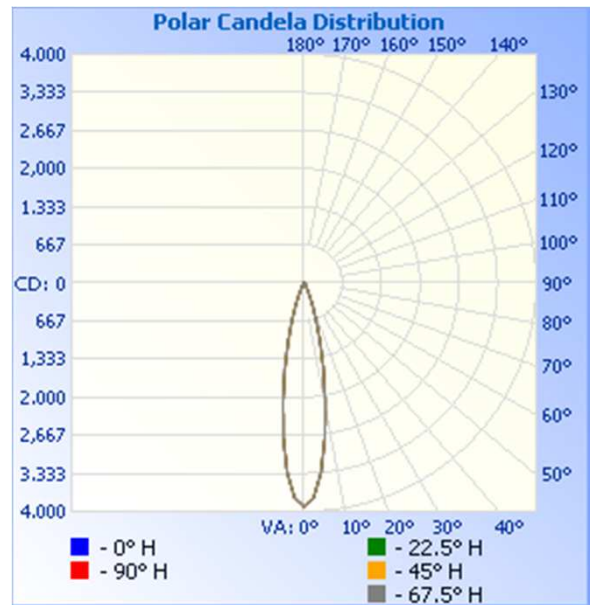
RESULTS OF TEST (cont'd)

Photometric and Electrical Measurements at Ambient Temperature (25°C +/- 1°C) – Distribution Method

Intertek Sample No.	Base Orientation	Input Voltage {Vac}	Input Current (mA)	Input Power (Watts)	Input Power Factor	Absolute Luminous Flux (Lumens)	Lumen Efficacy (Lumens Per Watt)
LAN1606150659-002	UP	120.0	92.80	10.50	0.943	747.9	71.23

Intensity (Candlepower) Summary at 25°C - Candelas

Angle	0	22.5	45	67.5	90
0	3909	3909	3909	3909	3909
5	3330	3330	3330	3330	3330
10	2098	2098	2098	2098	2098
15	1066	1066	1066	1066	1066
20	456	456	456	456	456
25	161	161	161	161	161
30	70	70	70	70	70
35	45	45	45	45	45
40	35	35	35	35	35
45	28	28	28	28	28
50	22	22	22	22	22
55	19	19	19	19	19
60	15	15	15	15	15
65	11	11	11	11	11
70	8	8	8	8	8
75	5	5	5	5	5
80	3	3	3	3	3
85	1	1	1	1	1
90	0	0	0	0	0

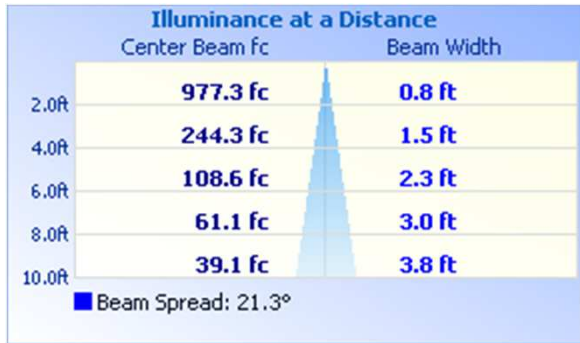


RESULTS OF TEST (cont'd)

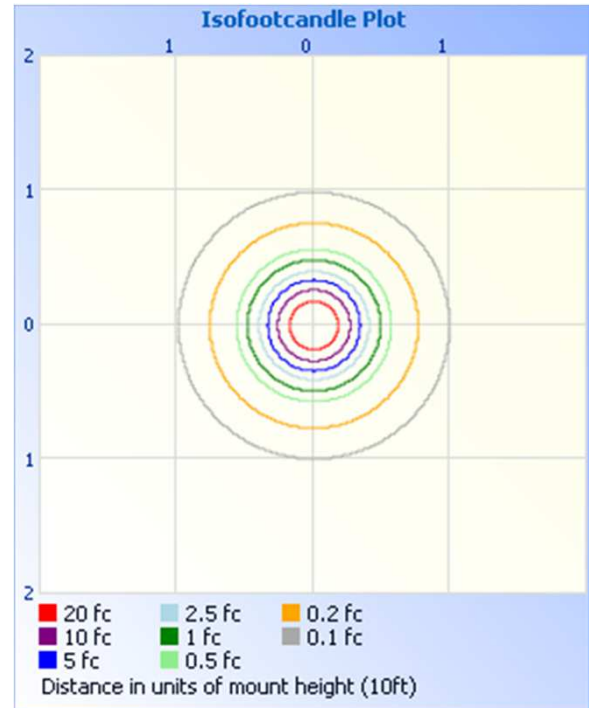
Illumination Plots

Mounting Height: 10 ft.

Illuminance - Cone of Light



Isoillumination Plot



Zonal Lumen Summary and Percentages at 25°C

Zone	Lumens	% Luminaire
0-30	661.2	88.4
0-40	690.8	92.4
0-60	728.9	97.5
60-90	18.9	2.5
0-90	747.9	100.0
90-180	0.0	0.0
0-180	747.9	100.0

Zonal Lumens and Percentages at 25°C

Zone	Lumens	% Luminaire
0-10	275.0	36.8
10-20	299.1	40.0
20-30	87.1	11.6
30-40	29.6	4.0
40-50	21.6	2.9
50-60	16.5	2.2
60-70	11.3	1.5
70-80	6.0	0.8
80-90	1.7	0.2

PICTURE (not to scale)



CONCLUSION

The results tabulated in this report are representative of the actual test samples submitted for this report only. The data is provided to the client for further evaluation. Compliance to the referenced specification requirements was not determined in this report.

In Charge Of Tests:



Jesse Reyna
Engineer
Lighting Division

Attachment: None

Report Reviewed By:



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Senior Associate Engineer
Lighting Division