



REPORT

25800 COMMERCENTRE DRIVE, LAKE FOREST, CA 92630

Project No. G102406056

Date: July 14, 2016

REPORT NO. 102406056LAX-097

TEST OF ONE LED LAMP

MODEL NO. SP38-18-09D-927-03

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-00660665-1.

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 SP38-18-09D-927-03. The sample was received by Intertek on July 5, 2016, in undamaged condition and one sample was tested as received. The sample designation was LAN1607051037-002.

DATES OF TESTS: July 7, 2016 through July 8, 2016.

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SUMMARY

Model No.:	SP38-18-09D-927-03
Description:	LED LAMP

Criteria	Result	
	Sphere	Goniometer
Total Lumen Output (Lumens)	931.1	939.0
Total Power (W)	18.39	18.34
Luminaire Efficacy (LPW)	50.63	51.20

Criteria	Result
Power Factor	0.987
Current ATHD %	13.45
Correlated Color Temperature (CCT - K)	2636
Color Rendering Index (CRI - Ra)	96.5
Color Rendering Index (CRI - R9)	93.1
DUV	0.000
Chromaticity Coordinate (x)	0.466
Chromaticity Coordinate (y)	0.413
Chromaticity Coordinate (u')	0.265
Chromaticity Coordinate (v')	0.529

EQUIPMENT LIST

Equipment Used	Model Number	Control Number	Last Date Calibrated	Calibration Due Date	Date Used
LapSphere 3M Integrating Sphere	CA-11821-LRT	000830	06/10/16	07/10/16	07/08/16
LabSphere Spectrometer	CDS-3020	000834	06/10/16	07/10/16	07/08/16
California Instruments Power Supply	CSW5550	001338	VBU	VBU	07/08/16
Yokogawa Power Meter	WT333	001320	06/10/16	06/10/17	07/08/16
Extech Instruments Stop Watch	365510	001379	11/19/15	11/19/16	07/08/16
Temp. & RH Meter	971	001178	12/18/15	12/18/16	07/08/16
LSI High Speed Mirror Goniometer	6440T	000943	06/13/16	07/13/16	07/07/16
Elgar Power Supply	CW1251	000944	VBU	VBU	07/07/16
Yokogawa Power Analyzer	WT210	000945	12/04/15	12/04/16	07/07/16
Temp. & RH Meter	971	001380	12/17/15	12/17/16	07/07/16
Extech Instruments Stop Watch	365510	001379	11/19/15	11/19/16	07/07/16
Tape Measure	C1-25	000915	12/04/15	12/04/16	07/07/16



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

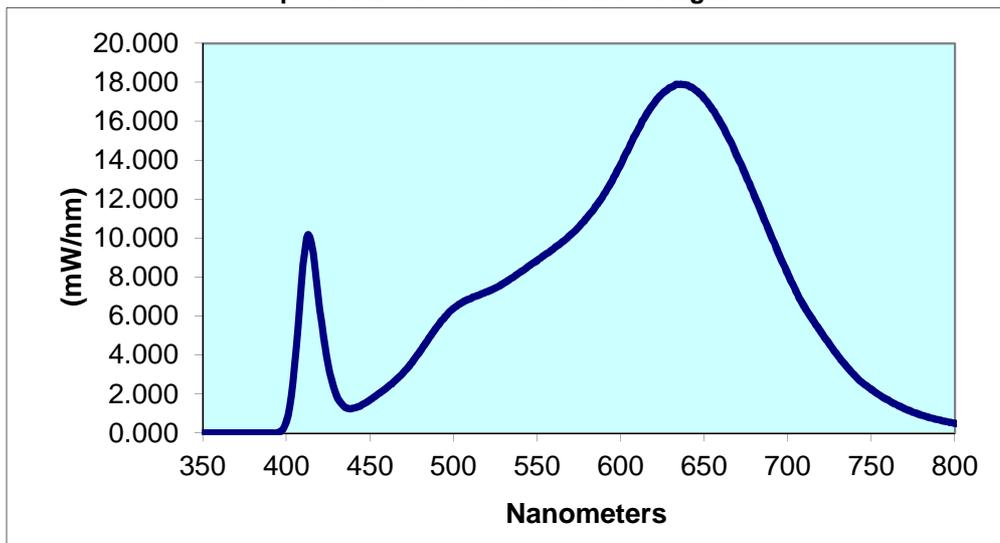
Intertek Sample No.	Base Orientation	Input Voltage (Vac)	Input Current (mA)	Input Power (Watts)	Input Power Factor	Current ATHD (%)	Luminous Flux (Lumens)	Lumen Efficacy (LPW)
LAN1607051037-002	UP	120.0	155.2	18.39	0.987	13.45	931.1	50.63

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')
2636	96.5	93.1	0.000	0.466	0.413	0.265	0.529

Spectral Distribution over Visible Wavelengths

nm	mW/nm								
350	0.001	440	1.280	530	7.693	620	16.92	710	6.478
355	0.001	445	1.436	535	7.964	625	17.43	715	5.799
360	0.001	450	1.704	540	8.260	630	17.74	720	5.168
365	0.001	455	2.011	545	8.571	635	17.89	725	4.556
370	0.001	460	2.336	550	8.854	640	17.86	730	3.964
375	0.001	465	2.690	555	9.171	645	17.59	735	3.435
380	0.001	470	3.115	560	9.476	650	17.17	740	2.963
385	0.001	475	3.607	565	9.807	655	16.60	745	2.566
390	0.001	480	4.211	570	10.17	660	15.91	750	2.241
395	0.037	485	4.852	575	10.59	665	15.09	755	1.952
400	0.579	490	5.454	580	11.07	670	14.17	760	1.700
405	3.515	495	5.992	585	11.65	675	13.20	765	1.454
410	8.648	500	6.416	590	12.28	680	12.19	770	1.250
415	9.744	505	6.710	595	12.97	685	11.17	775	1.070
420	6.328	510	6.900	600	13.79	690	10.13	780	0.926
425	3.530	515	7.071	605	14.65	695	9.127		
430	1.931	520	7.266	610	15.51	700	8.189		
435	1.335	525	7.446	615	16.31	705	7.280		

Spectral Data Over Visible Wavelengths



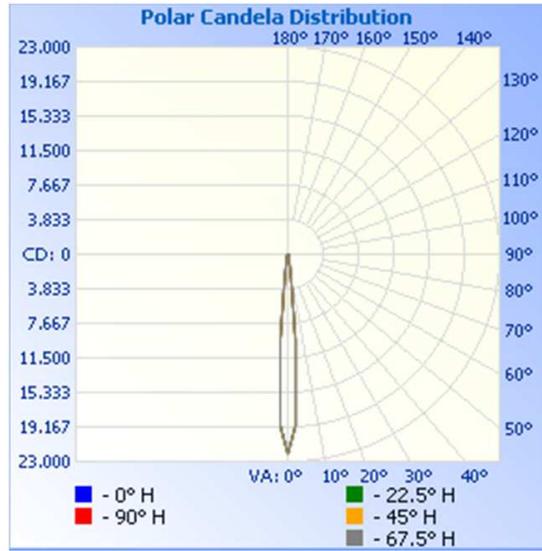
RESULTS OF TEST

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)
LAN1607051037-002	UP	120.0	154.9	18.34	0.986	939.0	51.20

Intensity (Candlepower) Summary at 25°C - Candelas

Angle	0	22.5	45	67.5	90
0	22096	22096	22096	22096	22096
5	9265	9265	9265	9265	9265
10	1062	1062	1062	1062	1062
15	385	385	385	385	385
20	218	218	218	218	218
25	147	147	147	147	147
30	122	122	122	122	122
35	111	111	111	111	111
40	82	82	82	82	82
45	36	36	36	36	36
50	27	27	27	27	27
55	28	28	28	28	28
60	23	23	23	23	23
65	16	16	16	16	16
70	13	13	13	13	13
75	5	5	5	5	5
80	0	0	0	0	0
85	3	3	3	3	3
90	0	0	0	0	0

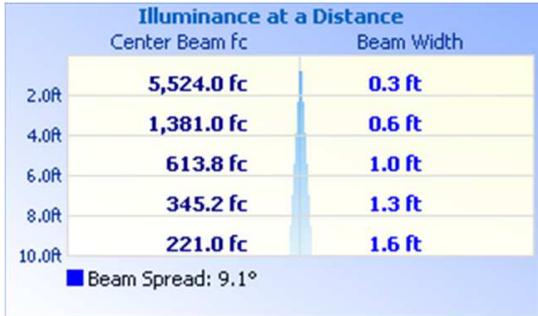


RESULTS OF TEST

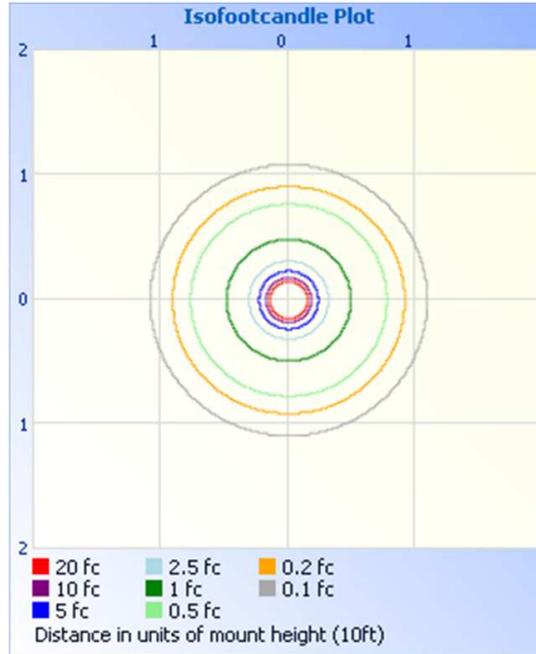
Illumination Plots

Mounting Height: 10 ft.

Illuminance - Cone of Light



Isoillumination Plot



Zonal Lumen Summary and Percentages at 25°C

Zone	Lumens	% Luminaire
0-30	788.9	84.0
0-40	856.0	91.2
0-60	912.4	97.2
60-90	26.6	2.8
0-90	939.0	100.0
90-180	0.0	0.0
0-180	939.0	100.0

Zonal Lumens and Percentages at 25°C

Zone	Lumens	% Luminaire
0-10	596.8	63.6
10-20	122.3	13.0
20-30	69.8	7.4
30-40	67.0	7.1
40-50	32.4	3.5
50-60	24.1	2.6
60-70	17.8	1.9
70-80	6.5	0.7
80-90	2.2	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:



Kenda Branch
Lighting Performance Team Lead
Lighting Division