REPORT

25800 COMMERCENTRE DRIVE, LAKE FOREST, CA 92630

Project No. G102406056 Date: July 14, 2016

REPORT NO. 102406056LAX-098

TEST OF ONE LED LAMP

MODEL NO. SP38-18-09D-830-03
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-830-03. The sample was received by Intertek on July 5, 2016, in undamaged condition and one sample was tested as received. The sample designation was LAN1607051037-003.

DATES OF TESTS: July 8, 2016

SUMMARY

Model No.:	SP38-18-09D-830-03
Description:	LED LAMP

	Result	
Criteria	Sphere	Goniometer
Total Lumen Output (Lumens)	1299	1329
Total Power (W)	18.27	18.18
Luminaire Efficacy (LPW)	71.10	73.10

Criteria	Result
Power Factor	0.988
Current ATHD %	13.05
Correlated Color Temperature (CCT - K)	2919
Color Rendering Index (CRI - Ra)	85.8
Color Rendering Index (CRI - R9)	18.8
DUV	0.001
Chromaticity Coordinate (x)	0.442
Chromaticity Coordinate (y)	0.405
Chromaticity Coordinate (u')	0.254
Chromaticity Coordinate (v')	0.523

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	07/08/16
Elgar Power Supply	CW1251	000944	VBU	VBU	07/08/16
Yokogawa Power Analyzer	WT210	000945	12/07/15	12/07/16	07/08/16
Temp. & RH Meter	971	001178	12/18/15	12/18/16	07/08/16
Extech Instruments Stop Watch	365510	001379	11/19/15	11/19/16	07/08/16
Tape Measure	C1-25	000915	12/04/15	12/04/16	07/08/16

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

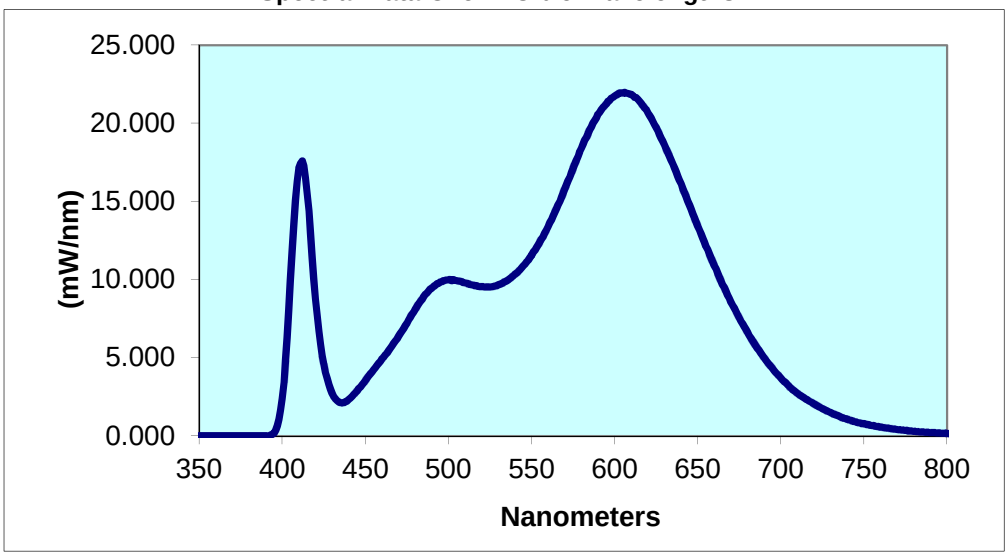
Intertek Sample No.	Base Orientation	Input Voltage {Vac}	Input Current (mA)	Input Power (Watts)	Input Power Factor	Current ATHD (%)	Luminous Flux (Lumens)	Lumen Efficacy (LPW)
LAN1607051037-003	UP	120.0	154.1	18.27	0.988	13.05	1299	71.10

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')
2919	85.8	18.8	0.001	0.442	0.405	0.254	0.523

Spectral Distribution over Visible Wavelengths

nm	mW/nm	nm	mW/nm	nm	mW/nm	nm	mW/nm	nm	mW/nm
350	0.006	440	2.335	530	9.674	620	20.66	710	2.732
355	0.006	445	2.873	535	9.916	625	19.72	715	2.366
360	0.006	450	3.546	540	10.34	630	18.60	720	2.050
365	0.006	455	4.238	545	10.87	635	17.39	725	1.753
370	0.006	460	4.929	550	11.56	640	16.11	730	1.494
375	0.006	465	5.611	555	12.41	645	14.75	735	1.265
380	0.006	470	6.384	560	13.40	650	13.44	740	1.065
385	0.006	475	7.218	565	14.55	655	12.13	745	0.906
390	0.006	480	8.106	570	15.81	660	10.90	750	0.781
395	0.192	485	8.907	575	17.12	665	9.698	755	0.665
400	2.377	490	9.473	580	18.42	670	8.578	760	0.562
405	9.963	495	9.854	585	19.60	675	7.561	765	0.491
410	17.11	500	9.988	590	20.59	680	6.632	770	0.406
415	15.54	505	9.944	595	21.25	685	5.763	775	0.351
420	8.773	510	9.785	600	21.74	690	4.996	780	0.294
425	4.608	515	9.639	605	21.94	695	4.317		
430	2.734	520	9.550	610	21.85	700	3.708		
435	2.129	525	9.516	615	21.41	705	3.176		

Spectral Data Over Visible Wavelengths



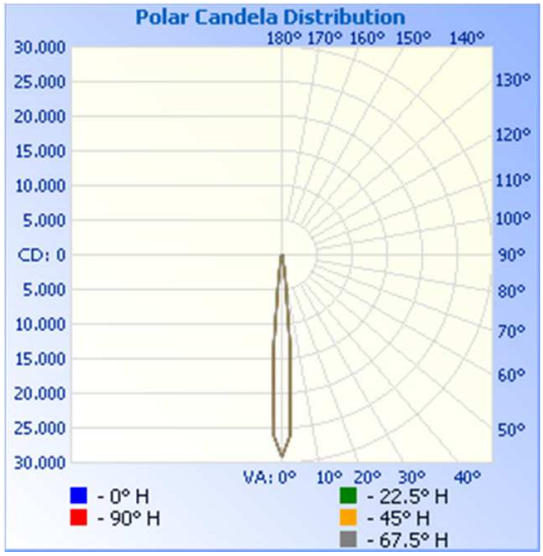
RESULTS OF TEST

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)
LAN1607051037-003	UP	120.0	153.3	18.18	0.988	1329	73.10

Intensity (Candlepower) Summary at 25°C - Candelas

Angle	0	22.5	45	67.5	90
0	29151	29151	29151	29151	29151
5	13963	13963	13963	13963	13963
10	1537	1537	1537	1537	1537
15	529	529	529	529	529
20	299	299	299	299	299
25	202	202	202	202	202
30	166	166	166	166	166
35	145	145	145	145	145
40	102	102	102	102	102
45	47	47	47	47	47
50	40	40	40	40	40
55	37	37	37	37	37
60	24	24	24	24	24
65	21	21	21	21	21
70	20	20	20	20	20
75	9	9	9	9	9
80	9	9	9	9	9
85	4	4	4	4	4
90	2	2	2	2	2

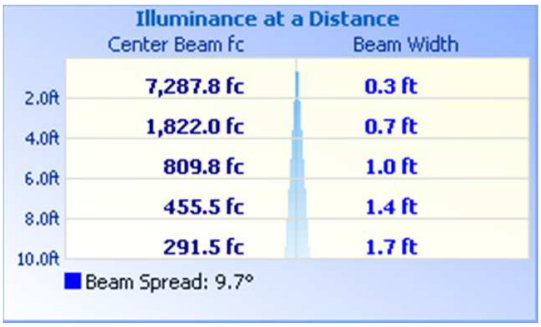


RESULTS OF TEST

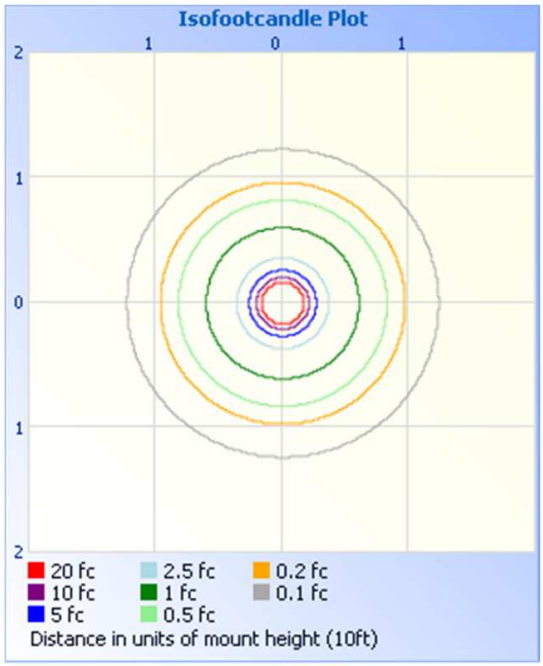
Illumination Plots

Mounting Height: 10 ft.

Illuminance - Cone of Light



Isoillumination Plot



Zonal Lumen Summary and Percentages at 25°C

Zone	Lumens	% Luminaire
0-30	1133	85.3
0-40	1220	91.9
0-60	1293	97.3
60-90	35.9	2.7
0-90	1328	100.0
90-180	0.3	0.0
0-180	1329	100.0

Zonal Lumens and Percentages at 25°(

Zone	Lumens	% Luminaire
0-10	865.9	65.2
10-20	171.5	12.9
20-30	95.3	7.2
30-40	87.7	6.6
40-50	42.0	3.2
50-60	30.0	2.3
60-70	20.1	1.5
70-80	10.2	0.8
80-90	5.6	0.4
90-100	0.3	0.0

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

Report Reviewed By:

Kenda Branch
Lighting Performance Team Lead
Lighting Division

Attachment: None