



# REPORT

25800 COMMERCENTRE DRIVE, LAKE FOREST, CA 92630

Project No. G102406056

Date: July 14, 2016

REPORT NO. 102406056LAX-099

TEST OF ONE LED LAMP

MODEL NO. SP38-18-36D-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 SP38-18-36D-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 LAN1607051037-004.

DATES OF TESTS: July 8, 2016

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SUMMARY

Model No.:	SP38-18-36D-830-03
Description:	LED LAMP

Criteria	Result	
	Sphere	Goniometer
Total Lumen Output (Lumens)	1353	1405
Total Power (W)	18.47	18.39
Luminaire Efficacy (LPW)	73.25	76.40

Criteria	Result
Power Factor	0.990
Current ATHD %	11.34
Correlated Color Temperature (CCT - K)	2989
Color Rendering Index (CRI - Ra)	85.3
Color Rendering Index (CRI - R9)	12.7
DUV	0.002
Chromaticity Coordinate (x)	0.441
Chromaticity Coordinate (y)	0.411
Chromaticity Coordinate (u')	0.250
Chromaticity Coordinate (v')	0.525

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**

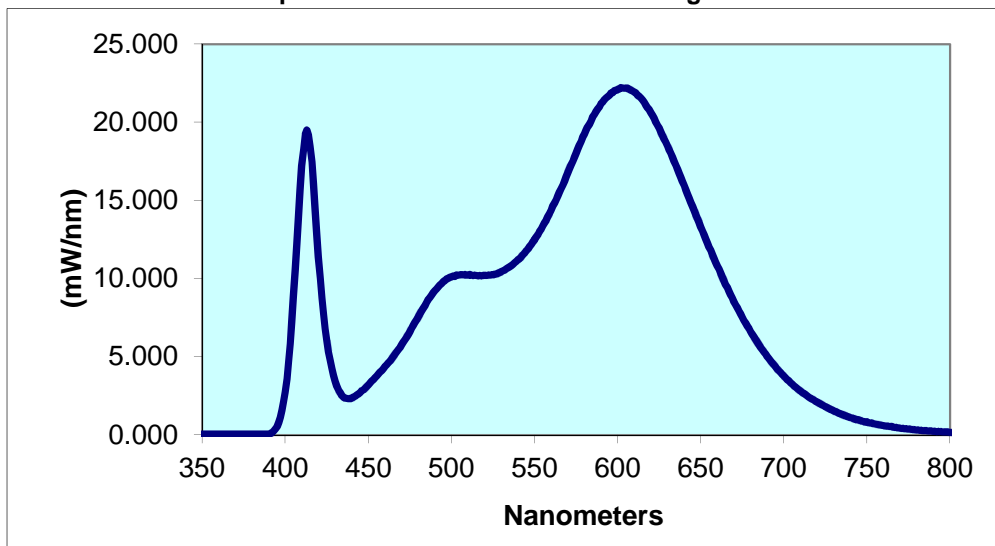
Intertek Sample No.	Base Orientation	Input Voltage (Vac)	Input Current (mA)	Input Power (Watts)	Input Power Factor	Current ATHD (%)	Luminous Flux (Lumens)	Lumen Efficacy (LPW)
LAN1607051037-004	UP	120.0	155.5	18.47	0.990	11.34	1353	73.25

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')
2989	85.3	12.7	0.002	0.441	0.411	0.250	0.525

**Spectral Distribution over Visible Wavelengths**

nm	mW/nm	nm	mW/nm	nm	mW/nm	nm	mW/nm	nm	mW/nm
350	0.041	440	2.362	530	10.45	620	20.60	710	2.815
355	0.041	445	2.703	535	10.75	625	19.62	715	2.429
360	0.041	450	3.201	540	11.20	630	18.46	720	2.104
365	0.041	455	3.780	545	11.79	635	17.24	725	1.808
370	0.041	460	4.390	550	12.49	640	15.96	730	1.545
375	0.041	465	5.021	555	13.37	645	14.61	735	1.314
380	0.041	470	5.770	560	14.38	650	13.32	740	1.116
385	0.041	475	6.617	565	15.54	655	12.02	745	0.956
390	0.041	480	7.559	570	16.77	660	10.82	750	0.821
395	0.537	485	8.487	575	18.02	665	9.633	755	0.699
400	2.725	490	9.239	580	19.25	670	8.545	760	0.591
405	8.823	495	9.808	585	20.36	675	7.538	765	0.525
410	17.23	500	10.13	590	21.20	680	6.621	770	0.430
415	18.46	505	10.25	595	21.73	685	5.779	775	0.372
420	11.38	510	10.22	600	22.11	690	5.026	780	0.317
425	6.045	515	10.20	605	22.18	695	4.358		
430	3.442	520	10.21	610	21.94	700	3.770		
435	2.425	525	10.24	615	21.41	705	3.253		

**Spectral Data Over Visible Wavelengths**



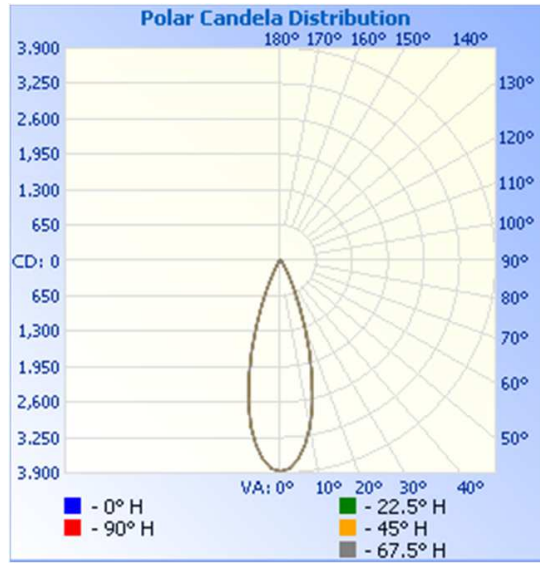
**RESULTS OF TEST**

**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)
LAN1607051037-004	UP	120.0	154.9	18.39	0.989	1405	76.40

**Intensity (Candlepower) Summary at 25°C - Candelas**

Angle	0	22.5	45	67.5	90
0	3866	3866	3866	3866	3866
5	3659	3659	3659	3659	3659
10	3088	3088	3088	3088	3088
15	2215	2215	2215	2215	2215
20	1274	1274	1274	1274	1274
25	595	595	595	595	595
30	253	253	253	253	253
35	126	126	126	126	126
40	77	77	77	77	77
45	54	54	54	54	54
50	44	44	44	44	44
55	37	37	37	37	37
60	31	31	31	31	31
65	22	22	22	22	22
70	13	13	13	13	13
75	6	6	6	6	6
80	1	1	1	1	1
85	0	0	0	0	0
90	0	0	0	0	0



**RESULTS OF TEST**

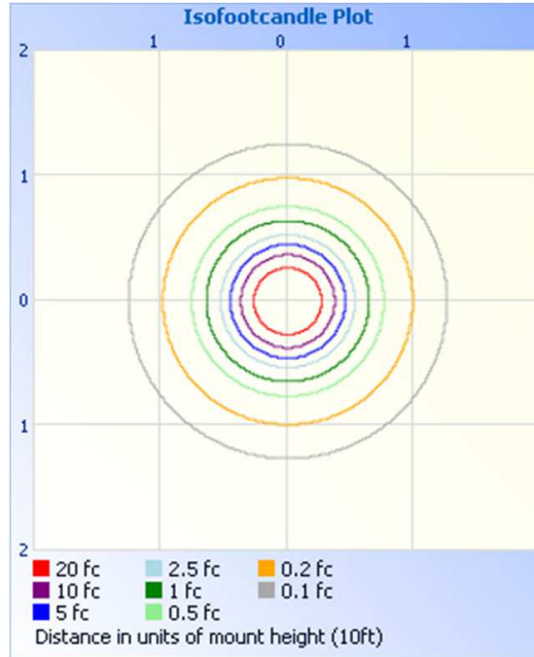
Illumination Plots

Mounting Height: 10 ft.

Illuminance - Cone of Light



Isoillumination Plot



Zonal Lumen Summary and Percentages at 25°C

Zone	Lumens	% Luminaire
0-30	1214	86.4
0-40	1300	92.5
0-60	1377	98.0
60-90	28.4	2.0
0-90	1405	100.0
90-180	0.0	0.0
0-180	1405	100.0

Zonal Lumens and Percentages at 25°C

Zone	Lumens	% Luminaire
0-10	329.9	23.5
10-20	595.2	42.4
20-30	289.3	20.6
30-40	85.6	6.1
40-50	43.6	3.1
50-60	33.4	2.4
60-70	21.6	1.5
70-80	6.4	0.5
80-90	0.4	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

Attachment: None

Report Reviewed By:



Kenda Branch  
Lighting Performance Team Lead  
Lighting Division