



# REPORT

25800 COMMERCENTRE DRIVE, LAKE FOREST, CA 92630

Project No. G102406056

Date: July 14, 2016

REPORT NO. 102406056LAX-096

TEST OF ONE LED LAMP

MODEL NO. SP38-18-36D-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 SP38-18-36D-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 LAN1607051037-001.

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

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SUMMARY

Model No.:	SP38-18-36D-927-03
Description:	LED LAMP

Criteria	Result	
	Sphere	Goniometer
Total Lumen Output (Lumens)	995.6	1021
Total Power (W)	18.01	17.90
Luminaire Efficacy (LPW)	55.28	57.04

Criteria	Result
Power Factor	0.987
Current ATHD %	12.91
Correlated Color Temperature (CCT - K)	2691
Color Rendering Index (CRI - Ra)	95.6
Color Rendering Index (CRI - R9)	97.0
DUV	0.002
Chromaticity Coordinate (x)	0.458
Chromaticity Coordinate (y)	0.407
Chromaticity Coordinate (u')	0.263
Chromaticity Coordinate (v')	0.526

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)
LAN1607051037-001	UP	120.0	152.0	18.01	0.987	12.91	995.6	55.28

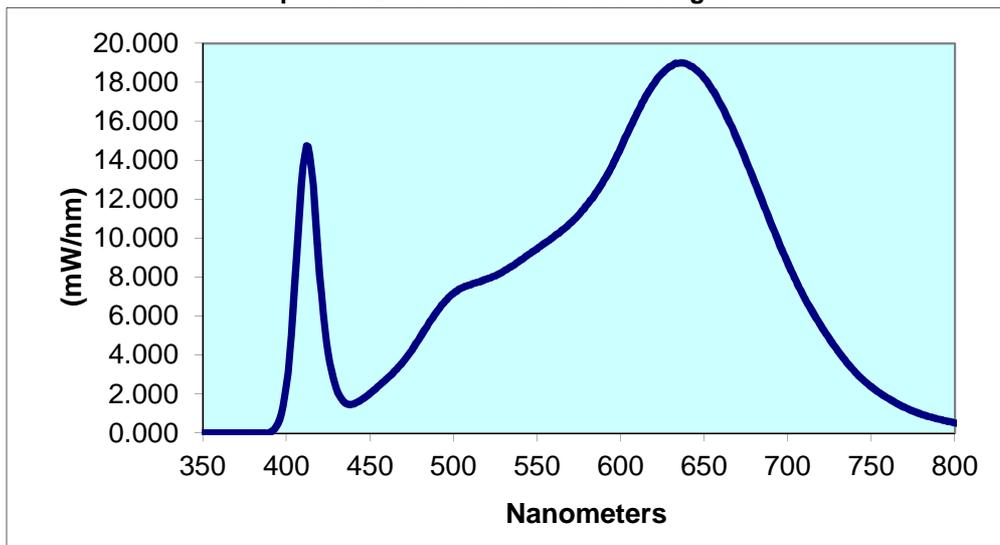
  

Correlated Color Temperature (K)	CRI -Ra	CRI -R9	DUV	CIE 31' Chromaticity Coordinate (x)	CIE 31' Chromaticity Coordinate (y)	CIE 76' Chromaticity Coordinate (u')	CIE 76' Chromaticity Coordinate (v')
2691	95.6	97.0	0.002	0.458	0.407	0.263	0.526

**Spectral Distribution over Visible Wavelengths**

nm	mW/nm								
350	0.001	440	1.500	530	8.312	620	17.94	710	6.947
355	0.001	445	1.716	535	8.564	625	18.49	715	6.190
360	0.001	450	2.031	540	8.874	630	18.83	720	5.488
365	0.001	455	2.407	545	9.171	635	18.99	725	4.841
370	0.001	460	2.793	550	9.460	640	18.93	730	4.213
375	0.001	465	3.206	555	9.769	645	18.64	735	3.656
380	0.001	470	3.686	560	10.07	650	18.21	740	3.160
385	0.001	475	4.251	565	10.41	655	17.59	745	2.735
390	0.040	480	4.931	570	10.79	660	16.87	750	2.377
395	0.503	485	5.618	575	11.21	665	16.00	755	2.060
400	2.423	490	6.240	580	11.73	670	15.02	760	1.785
405	7.486	495	6.785	585	12.33	675	14.00	765	1.527
410	13.68	500	7.182	590	13.00	680	12.93	770	1.321
415	13.60	505	7.452	595	13.73	685	11.84	775	1.135
420	8.105	510	7.611	600	14.62	690	10.75	780	0.972
425	4.120	515	7.749	605	15.55	695	9.703		
430	2.264	520	7.916	610	16.45	700	8.734		
435	1.560	525	8.069	615	17.28	705	7.809		

**Spectral Data Over Visible Wavelengths**



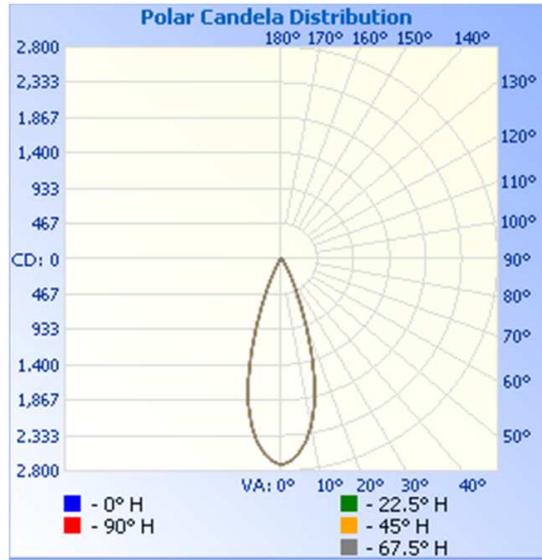
**RESULTS OF TEST**

**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)
LAN1607051037-001	UP	120.0	151.0	17.90	0.988	1021	57.04

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

Angle	0	22.5	45	67.5	90
0	2722	2722	2722	2722	2722
5	2573	2573	2573	2573	2573
10	2229	2229	2229	2229	2229
15	1656	1656	1656	1656	1656
20	944	944	944	944	944
25	435	435	435	435	435
30	181	181	181	181	181
35	86	86	86	86	86
40	53	53	53	53	53
45	38	38	38	38	38
50	30	30	30	30	30
55	26	26	26	26	26
60	21	21	21	21	21
65	15	15	15	15	15
70	10	10	10	10	10
75	4	4	4	4	4
80	1	1	1	1	1
85	1	1	1	1	1
90	0	0	0	0	0

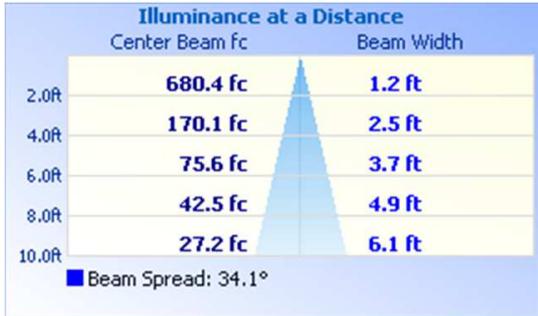


**RESULTS OF TEST**

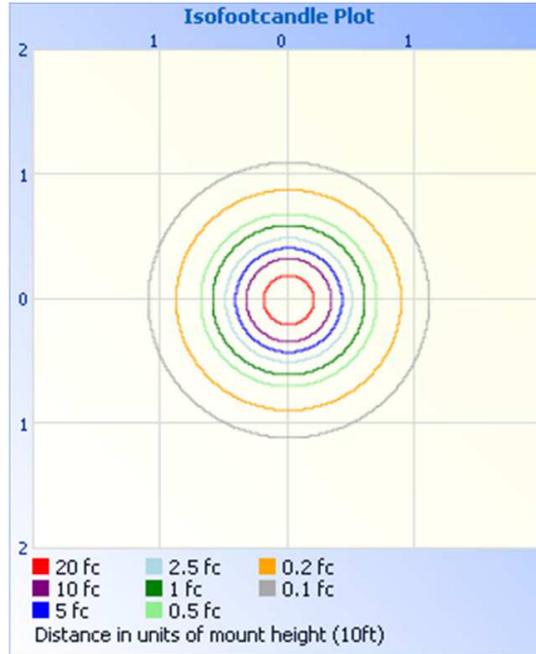
Illumination Plots

Mounting Height: 10 ft.

Illuminance - Cone of Light



Isoillumination Plot



Zonal Lumen Summary and Percentages at 25°C

Zone	Lumens	% Luminaire
0-30	887.3	86.9
0-40	946.8	92.7
0-60	1000	98.0
60-90	20.7	2.0
0-90	1021	100.0
90-180	0.0	0.0
0-180	1021	100.0

Zonal Lumens and Percentages at 25°C

Zone	Lumens	% Luminaire
0-10	234.2	22.9
10-20	440.7	43.2
20-30	212.4	20.8
30-40	59.5	5.8
40-50	30.1	3.0
50-60	23.2	2.3
60-70	15.4	1.5
70-80	4.7	0.5
80-90	0.6	0.1

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