



# REPORT

25800 COMMERCENTRE DRIVE, LAKE FOREST, CA 92630

Project No. G102406056

Date: May 25, 2016

REPORT NO. 102406056LAX-055

TEST OF ONE LED LAMP

MODEL NO. SP20W-11-25D-927-03-S3

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 SP20W-11-25D-927-03-S3. The sample was received by Intertek on May 24, 2016, in undamaged condition and one sample was tested as received. The sample designation was LAN1605241405-002.

**DATES OF TESTS:** May 24, 2016

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SUMMARY

Model No.:	SP20W-11-25D-927-03-S3
Description:	LED LAMP

Criteria	Result	
	Sphere	Goniometer
Total Lumen Output (Lumens)	584.0	599.3
Total Power (W)	10.64	10.70
Luminaire Efficacy (LPW)	54.89	56.01

Criteria	Result
Power Factor	0.816
Current ATHD %	29.99
Correlated Color Temperature (CCT - K)	2763
Color Rendering Index (CRI - Ra)	95.7
Color Rendering Index (CRI - R9)	95.9
DUV	0.002
Chromaticity Coordinate (x)	0.452
Chromaticity Coordinate (y)	0.404
Chromaticity Coordinate (u')	0.260
Chromaticity Coordinate (v')	0.524

EQUIPMENT LIST

Equipment Used	Model Number	Control Number	Last Date Calibrated	Calibration Due Date
LapSphere 2M Integrating Sphere	LMS760	000835	05/18/16	06/18/16
LabSphere Spectrometer	CDS-3020	000838	05/18/16	06/18/16
California Instruments Power Supply	CSW5550	001339	VBU	VBU
Yokogawa Power Meter	WT333	001320	06/03/15	06/03/16
Extech Instruments Stop Watch	365510	001379	11/19/15	11/19/16
Temp & HR Meter	971	001178	12/18/15	12/18/16
DC Power Supply	LPS-100-0833	000836	05/11/16	05/11/17
LSI High Speed Mirror Goniometer	6440T	000943	05/11/16	06/11/16
Elgar Power Supply	CW1251	000944	VBU	VBU
Yokogawa Power Analyzer	WT210	000945	12/04/15	12/04/16
Tape Measure	C1-25	000915	12/04/15	12/04/16



## 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 Two 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**

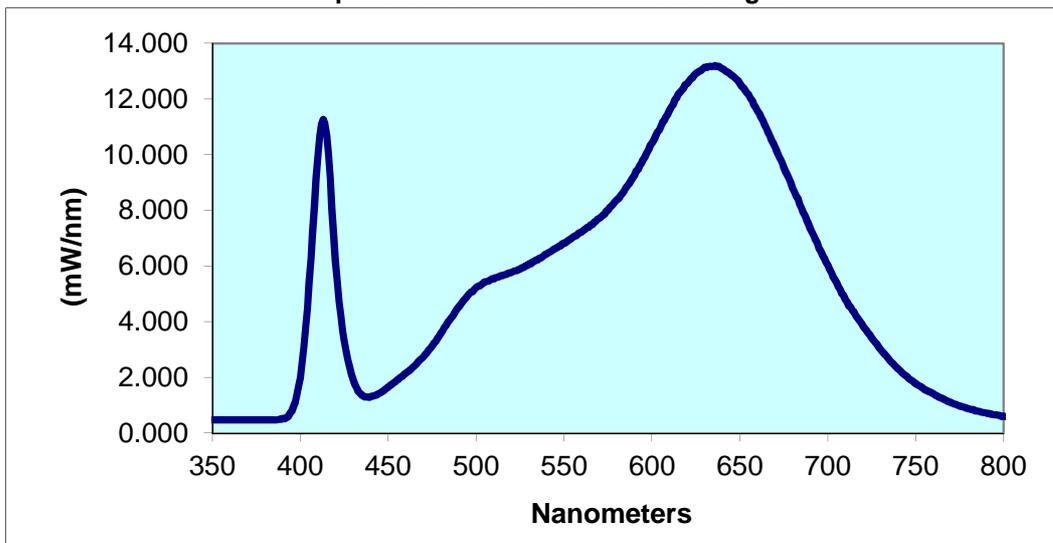
Intertek Sample No.	Base Orientation	Input Voltage {Vac}	Input Current (mA)	Input Power (Watts)	Input Power Factor	Current ATHD (%)	Luminous Flux (Lumens)	Lumen Efficacy (LPW)
LAN1605241405-002	UP	230.0	56.60	10.64	0.816	29.99	584.0	54.89

Correlated Color Temperature (K)	CRI -Ra	CRI -R9	DUV	CIE 31' Chromaticity Coordinate	CIE 31' Chromaticity Coordinate (y)	CIE 76' Chromaticity Coordinate (u')	CIE 76' Chromaticity Coordinate (v')
2763	95.7	95.9	0.002	0.452	0.404	0.260	0.524

**Spectral Distribution over Visible Wavelengths**

nm	mW/nm	nm	mW/nm	nm	mW/nm	nm	mW/nm	nm	mW/nm
350	0.475	440	1.308	530	6.082	620	12.560	710	4.796
355	0.475	445	1.437	535	6.222	625	12.920	715	4.321
360	0.475	450	1.653	540	6.434	630	13.150	720	3.848
365	0.475	455	1.901	545	6.631	635	13.180	725	3.425
370	0.475	460	2.156	550	6.829	640	13.090	730	2.996
375	0.475	465	2.425	555	7.041	645	12.870	735	2.630
380	0.475	470	2.740	560	7.229	650	12.550	740	2.311
385	0.475	475	3.141	565	7.475	655	12.150	745	2.027
390	0.530	480	3.599	570	7.716	660	11.570	750	1.781
395	0.780	485	4.073	575	8.016	665	10.940	755	1.566
400	2.000	490	4.528	580	8.380	670	10.260	760	1.421
405	5.373	495	4.933	585	8.795	675	9.536	765	1.250
410	10.040	500	5.228	590	9.269	680	8.797	770	1.099
415	10.690	505	5.432	595	9.824	685	8.073	775	0.975
420	6.184	510	5.537	600	10.420	690	7.336	780	0.868
425	3.316	515	5.659	605	11.020	695	6.645		
430	1.918	520	5.770	610	11.600	700	6.017		
435	1.369	525	5.899	615	12.170	705	5.405		

**Spectral Data Over Visible Wavelengths**



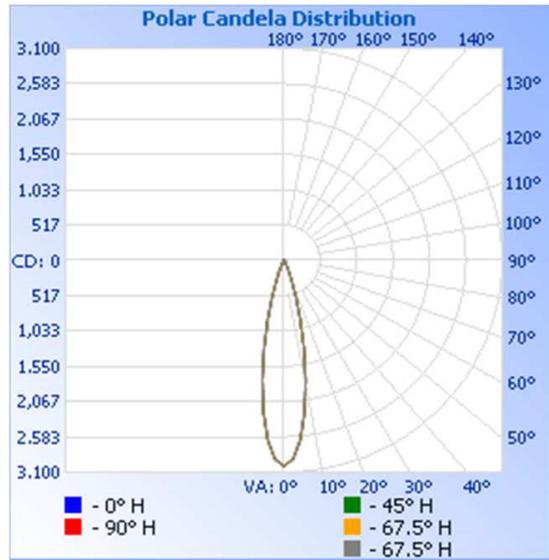
RESULTS OF TEST (cont'd)

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)
LAN1605241405-002	UP	230.0	56.90	10.70	0.817	599.3	56.01

Intensity (Candlepower) Summary at 25°C - Candelas

Angle	0	22.5	45	67.5	90
0	3006	3006	3006	3006	3006
5	2639	2639	2639	2639	2639
10	1772	1772	1772	1772	1772
15	881	881	881	881	881
20	333	333	333	333	333
25	116	116	116	116	116
30	54	54	54	54	54
35	36	36	36	36	36
40	27	27	27	27	27
45	21	21	21	21	21
50	18	18	18	18	18
55	15	15	15	15	15
60	12	12	12	12	12
65	9	9	9	9	9
70	7	7	7	7	7
75	4	4	4	4	4
80	3	3	3	3	3
85	1	1	1	1	1
90	1	1	1	1	1

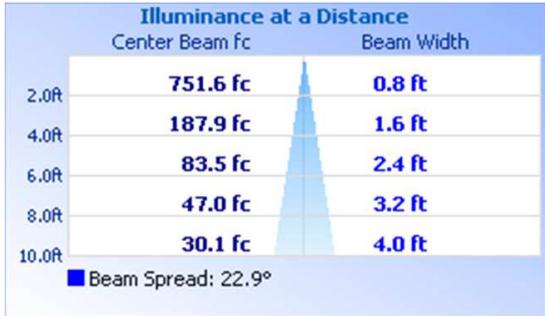


RESULTS OF TEST (cont'd)

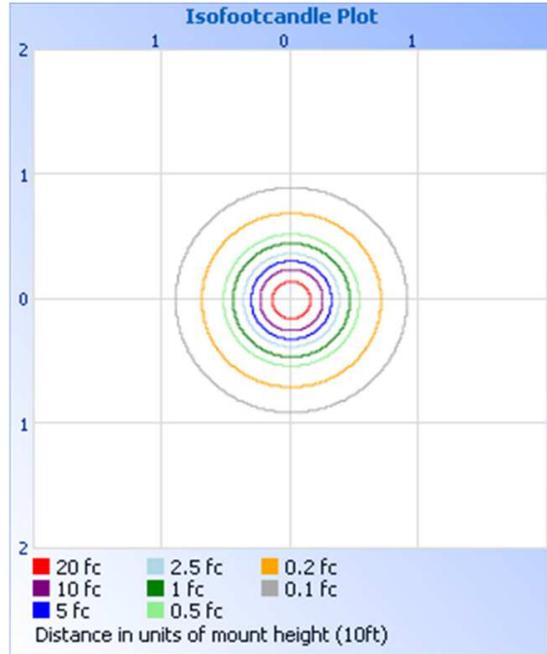
Illumination Plots

Mounting Height: 10 ft.

Illuminance - Cone of Light



Isoillumination Plot



Zonal Lumen Summary and Percentages at 25°C

Zone	Lumens	% Luminaire
0-30	530.6	88.5
0-40	553.9	92.4
0-60	583.8	97.4
60-90	15.4	2.6
0-90	599.2	100.0
90-180	0.1	0.0
0-180	599.3	100.0

Zonal Lumens and Percentages at 25°C

Zone	Lumens	% Luminaire
0-10	222.0	37.0
10-20	245.8	41.0
20-30	62.8	10.5
30-40	23.3	3.9
40-50	16.6	2.8
50-60	13.2	2.2
60-70	8.9	1.5
70-80	5.0	0.8
80-90	1.4	0.2
90-100	0.1	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