



REPORT

25800 COMMERCENTRE DRIVE, LAKE FOREST, CA 92630

Project No. G102406056

Date: May 27, 2016

REPORT NO. 102406056LAX-058

TEST OF ONE LED LAMP

MODEL NO. SP20W-11-10D-930-03-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-11-10D-930-03-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 LAN1605241405-005.

DATES OF TESTS: May 25, 2016

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SUMMARY

Model No.:	SP20W-11-10D-930-03-S3
Description:	LED LAMP

Criteria	Result	
	Sphere	Goniometer
Total Lumen Output (Lumens)	611.7	610.2
Total Power (W)	10.71	10.74
Luminaire Efficacy (LPW)	57.11	56.82

Criteria	Result
Power Factor	0.815
Current ATHD %	31.99
Correlated Color Temperature (CCT - K)	2956
Color Rendering Index (CRI - Ra)	96.3
Color Rendering Index (CRI - R9)	96.9
DUV	0.001
Chromaticity Coordinate (x)	0.442
Chromaticity Coordinate (y)	0.410
Chromaticity Coordinate (u')	0.252
Chromaticity Coordinate (v')	0.524

EQUIPMENT LIST

Equipment Used	Model Number	Control Number	Last Date Calibrated	Calibration Due Date
LapSphere 3M Integrating Sphere	CA-11821-LRT	000830	05/09/16	06/09/16
LabSphere Spectrometer	CDS-3020	000834	05/09/16	06/09/16
California Instruments Power Supply	CSW5550	001338	VBU	VBU
Yokogawa Power Meter	WT333	001319	06/12/15	06/12/16
Extech Instruments Stop Watch	365510	001380	12/17/15	12/17/16
Temp. & RH Meter	971	001178	12/18/15	12/18/16
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 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

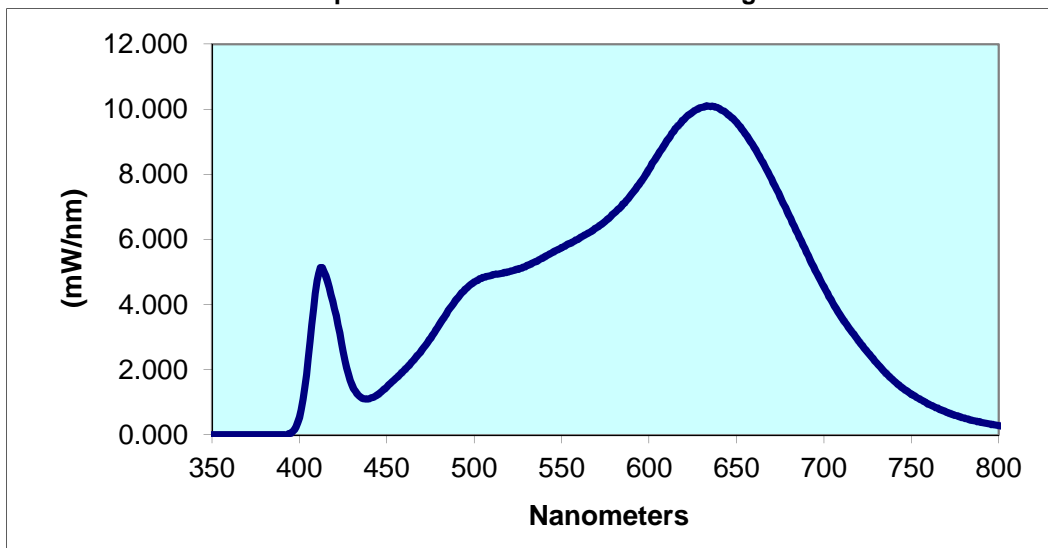
Intertek Sample No.	Base Orientation	Input Voltage {Vac}	Input Current (mA)	Input Power (Watts)	Input Power Factor	Current ATHD (%)	Luminous Flux (Lumens)	Lumen Efficacy (LPW)
LAN1605241405-005	UP	230.0	57.11	10.71	0.815	31.99	611.7	57.11

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')
2956	96.3	96.9	0.001	0.442	0.410	0.252	0.524

Spectral Distribution over Visible Wavelengths

nm	mW/nm	nm	mW/nm	nm	mW/nm	nm	mW/nm	nm	mW/nm
350	0.002	440	1.113	530	5.203	620	9.693	710	3.615
355	0.002	445	1.247	535	5.318	625	9.920	715	3.228
360	0.002	450	1.477	540	5.468	630	10.050	720	2.870
365	0.002	455	1.729	545	5.615	635	10.090	725	2.536
370	0.002	460	1.999	550	5.748	640	10.030	730	2.213
375	0.002	465	2.279	555	5.894	645	9.843	735	1.920
380	0.002	470	2.610	560	6.038	650	9.591	740	1.661
385	0.002	475	2.973	565	6.194	655	9.246	745	1.438
390	0.002	480	3.393	570	6.371	660	8.837	750	1.254
395	0.052	485	3.813	575	6.566	665	8.366	755	1.092
400	0.541	490	4.178	580	6.809	670	7.854	760	0.944
405	2.336	495	4.482	585	7.089	675	7.301	765	0.823
410	4.741	500	4.696	590	7.401	680	6.741	770	0.703
415	4.878	505	4.833	595	7.752	685	6.175	775	0.603
420	3.876	510	4.904	600	8.162	690	5.605	780	0.522
425	2.568	515	4.953	605	8.599	695	5.055		
430	1.533	520	5.018	610	9.020	700	4.544		
435	1.163	525	5.084	615	9.404	705	4.055		

Spectral Data Over Visible Wavelengths



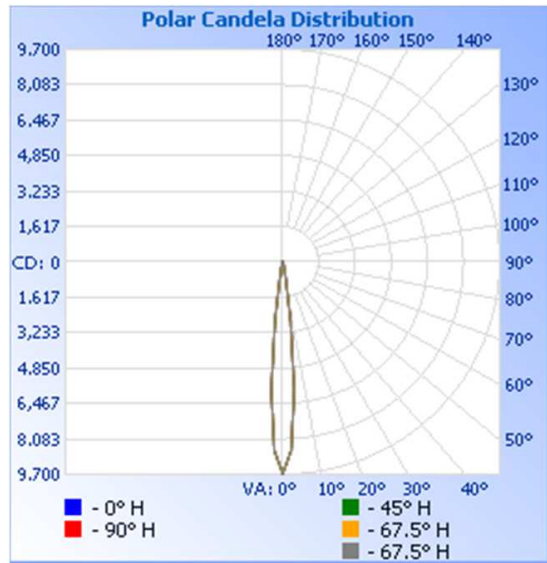
RESULTS OF TEST (cont'd)

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)
LAN1605241405-005	UP	230.0	57.10	10.74	0.919	610.2	56.82

Intensity (Candlepower) Summary at 25°C - Candelas

Angle	0	22.5	45	67.5	90
0	9664	9664	9664	9664	9664
5	5872	5872	5872	5872	5872
10	804	804	804	804	804
15	205	205	205	205	205
20	115	115	115	115	115
25	76	76	76	76	76
30	63	63	63	63	63
35	57	57	57	57	57
40	45	45	45	45	45
45	31	31	31	31	31
50	24	24	24	24	24
55	23	23	23	23	23
60	28	28	28	28	28
65	25	25	25	25	25
70	24	24	24	24	24
75	19	19	19	19	19
80	11	11	11	11	11
85	6	6	6	6	6
90	3	3	3	3	3

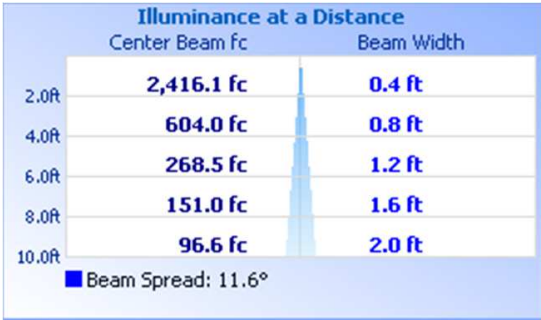


RESULTS OF TEST (cont'd)

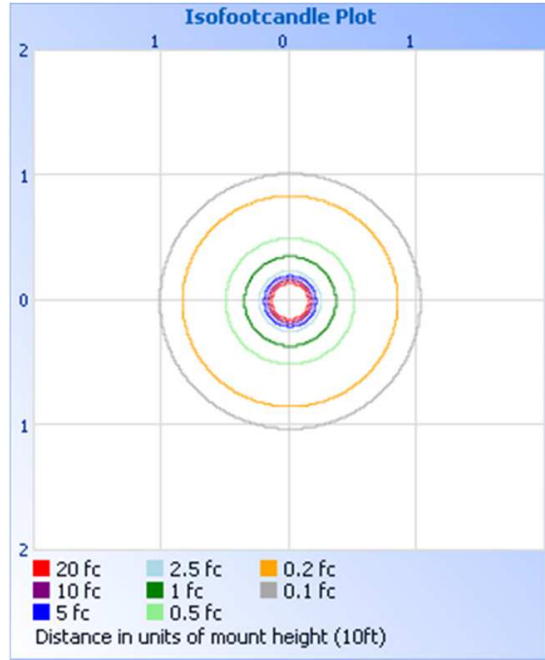
Illumination Plots

Mounting Height: 10 ft.

Illuminance - Cone of Light



Isoillumination Plot



Zonal Lumen Summary and Percentages at 25°C

Zone	Lumens	% Luminaire
0-30	478.4	78.4
0-40	514.5	84.3
0-60	560.9	91.9
60-90	48.9	8.0
0-90	609.7	99.9
90-180	0.4	0.1
0-180	610.2	100.0

Zonal Lumens and Percentages at 25°C

Zone	Lumens	% Luminaire
0-10	370.9	60.8
10-20	70.9	11.6
20-30	36.6	6.0
30-40	36.1	5.9
40-50	24.6	4.0
50-60	21.8	3.6
60-70	24.5	4.0
70-80	18.5	3.0
80-90	5.9	1.0
90-100	0.4	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