REPORT

545 E. Algonquin Rd., Arlington Heights, IL 60005

Project No. G102748333 Date: January 25, 2017

REPORT NO. 102748333CHI-019

TEST OF ONE LED AREA LIGHT

MODEL NO. HPAL-NW200-BP9
LED MODEL NO. OSRAM GW PSLPS1.EC-KTLP-5H7I-1
DRIVER MODEL NO. SOSEN SS-180R-50

RENDERED TO

SUPER BRIGHT LEDS, INC.
4400 EARTH CITY EXPRESSWAY
SAINT LOUIS, MO 63045

TEST: Electrical and Photometric tests as required to the IESNA test standard.

AUTHORIZATION: The testing performed was authorized by signed quote number Qu-00723537-3.

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

ANSI NEMA ANSLG C78.377: 2012: Specifications of the Chromaticity of Solid State Lighting Products

DESCRIPTION OF SAMPLE: The client submitted one production sample of model number HPAL-NW200-BP9. The sample was received by Intertek on January 20, 2017, in undamaged condition and one sample was tested as received. The sample designation was AH01202017035722C.

DATES OF TESTS: January 23, 2017 through January 25, 2017.

SUMMARY

Model No.:	HPAL-NW200-BP9
Description:	LED Area Light

Criteria	Result
Total Lumen Output (Lumens)	21814
Total Power (W)	191.3
Luminaire Efficacy (LPW)	114.0
Power Factor at 120Vac	0.998
Power Factor at 277Vac	0.936
Current ATHD % at 120Vac	4.19
Current ATHD % at 277Vac	12.64
Correlated Color Temperature (CCT - K)	5065
Color Rendering Index (CRI - Ra)	85.9
Color Rendering Index (CRI - R9)	22.1
DUV	0.001
Chromaticity Coordinate (x)	0.344
Chromaticity Coordinate (y)	0.354
Chromaticity Coordinate (u')	0.209
Chromaticity Coordinate (v')	0.486

EQUIPMENT LIST

Equipment Used	Model Number	Control Number	Last Date Calibrated	Calibration Due Date	Date Used
Yokogawa Power Meter	WT210	146919	07/11/16	07/11/17	01/25/17
Omega Newport Thermometer	DPI8-C24	146920	10/07/16	10/07/17	01/25/17
LSI High Speed Mirror Goniometer	6440T	146928	VBU	VBU	01/25/17
Newport Thermohygrometer	iServer	146956	01/06/17	01/06/18	01/25/17
Pacific, AC power supply	118-ACX	CHI0358	VBU	VBU	01/25/17
Labsphere Spectroradiometer	CDS1100	CHI0091	VBU	VBU	01/23/17
3 Meter Sphere	SPR600	CHI0088	VBU	VBU	01/23/17
Elgar AC Power Supply	CW1251M	146112	VBU	VBU	01/23/17
Sorenson DC Power Supply	XFR150-8	146846	VBU	VBU	01/23/17
Newport Humidity Recorder	iTHX-SD	146382	06/27/16	06/27/17	01/23/17
Yokogawa Power Meter	WT1600	146768	01/10/17	01/10/18	01/23/17
Fluke K/J Thermometer	52	146004	01/10/17	01/10/18	01/23/17

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 Model CDS 1100 CCD Array Spectroradiometer and Two Meter or Ten Foot 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 Xitron or Yokogawa Power Analyzer.

The calibration of the sphere photometer-spectroradiometer 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 Xitron or 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

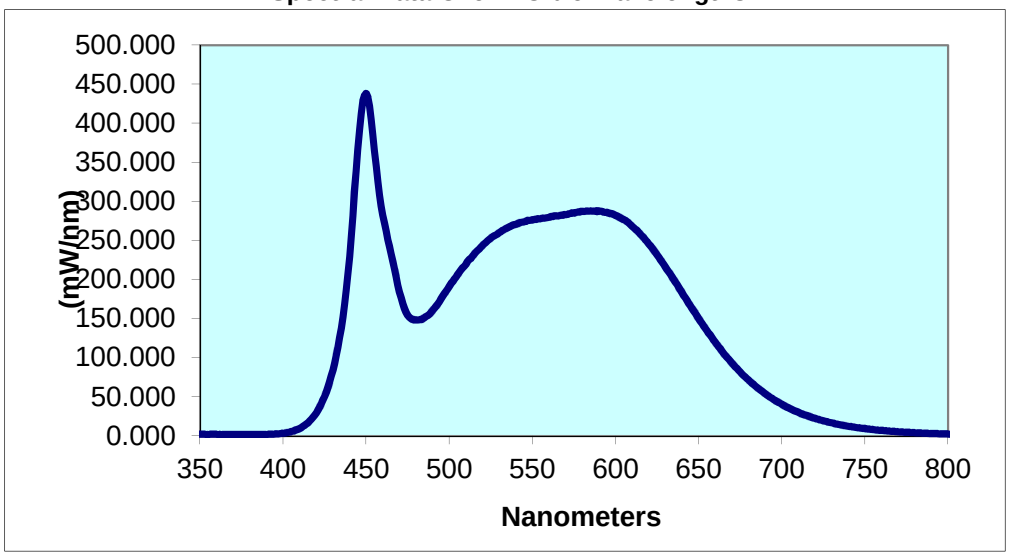
Intertek Sample No.	Base Orientation	Input Voltage {Vac}	Input Current (mA)	Input Power (Watts)	Input Power Factor	Current ATHD (%)
AH01202017035722C	Up	120.0	1600	191.54	0.998	4.19
		277.0	726.3	188.4	0.936	12.64

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')
5065	85.9	22.1	0.001	0.344	0.354	0.209	0.486

Spectral Distribution over Visible Wavelengths

nm	mW/nm	nm	mW/nm	nm	mW/nm	nm	mW/nm	nm	mW/nm
350	1.910	440	229.5	530	260.2	620	245.7	710	30.17
355	1.819	445	366.3	535	266.4	625	231.8	715	26.07
360	1.986	450	438.4	540	270.7	630	216.4	720	22.56
365	1.766	455	365.4	545	274.2	635	200.2	725	19.48
370	1.657	460	282.7	550	276.4	640	183.4	730	16.78
375	1.562	465	233.5	555	278.3	645	166.6	735	14.45
380	1.604	470	184.4	560	279.8	650	150.2	740	12.45
385	1.633	475	154.5	565	281.3	655	134.7	745	10.75
390	1.835	480	148.3	570	283.2	660	119.9	750	9.333
395	2.360	485	151.3	575	285.3	665	105.8	755	8.091
400	3.396	490	160.5	580	287.3	670	93.39	760	7.070
405	5.589	495	175.4	585	288.0	675	81.83	765	6.144
410	9.667	500	191.3	590	287.8	680	71.58	770	5.322
415	17.01	505	206.6	595	285.7	685	62.33	775	4.588
420	29.39	510	219.7	600	282.4	690	54.08	780	4.010
425	50.77	515	232.7	605	276.8	695	46.95		
430	84.36	520	243.8	610	268.5	700	40.62		
435	138.1	525	253.0	615	258.2	705	35.01		

Spectral Data Over Visible Wavelengths



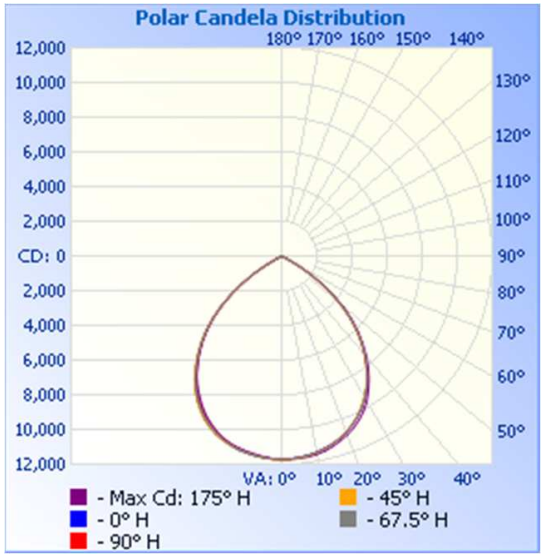
RESULTS OF TEST (cont'd)

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 (LPW)
AH01202017035722C	Up	120.1	1597	191.3	0.998	21814	114.0

Intensity (Candlepower) Summary at 25°C - Candelas

Angle	0	22.5	45	67.5	90
0	11717	11717	11717	11717	11717
5	11645	11610	11656	11655	11654
10	11466	11427	11472	11473	11464
15	11186	11194	11172	11178	11188
20	10788	10772	10752	10762	10764
25	10204	10163	10177	10174	10181
30	9442	9360	9398	9395	9401
35	8495	8446	8448	8438	8446
40	7369	7311	7301	7315	7310
45	6074	6020	6012	6011	6016
50	4561	4493	4468	4464	4455
55	2794	2759	2751	2745	2726
60	1042	992	1017	1048	1042
65	103	108	158	175	189
70	72	71	74	81	82
75	53	51	51	56	57
80	41	39	35	37	38
85	24	22	19	18	16
90	0	0	0	0	0

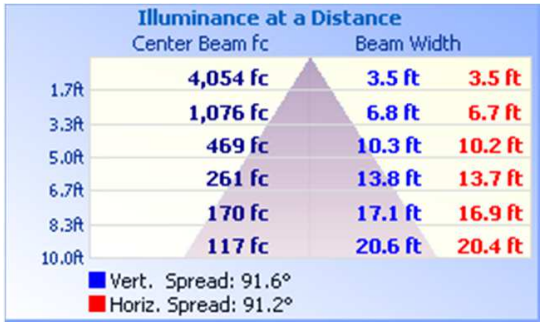


RESULTS OF TEST (cont'd)

Illumination Plots

Mounting Height: 10 ft.

Illuminance - Cone of Light



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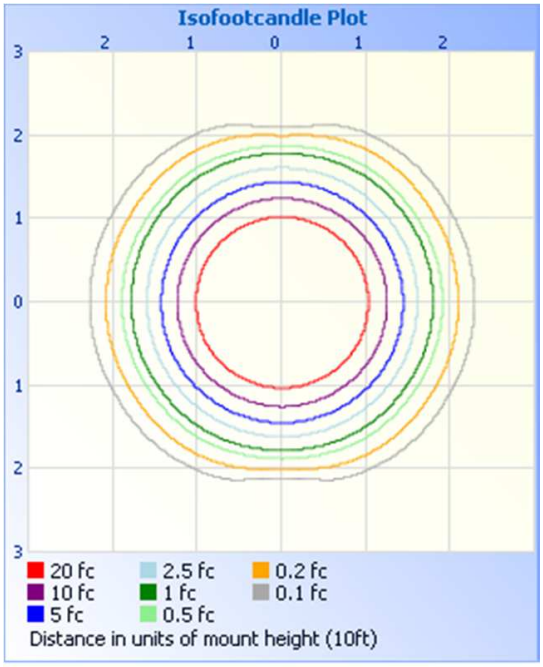


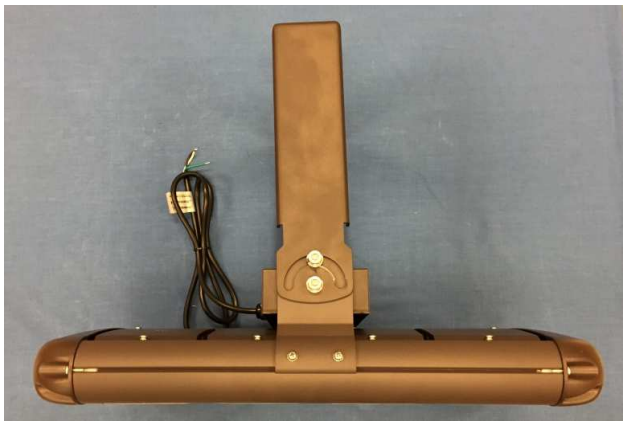
Zonal Lumen Summary and Percentages at 25°C

Zone	Lumens	% Luminaire
0-30	8998	41.2
0-40	14317	65.6
0-60	21422	98.2
60-90	392.6	1.8
0-90	21814	100.0
90-180	0.0	0.0
0-180	21814	100.0

Zonal Lumens and Percentages at 25°C

Zone	Lumens	% Luminaire
0-10	1108	5.1
10-20	3169	14.5
20-30	4721	21.6
30-40	5319	24.4
40-50	4638	21.3
50-60	2466	11.3
60-70	312.6	1.4
70-80	60.5	0.3
80-90	19.5	0.1

PICTURES (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:

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Report Reviewed By:

Timothy Quigley
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Attachment: None