REPORT

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

Project No. G102748333 Date: December 9, 2016

REPORT NO. 102748333CHI-011

TEST OF ONE LED PANEL LIGHT

MODEL NO. LPD-40K22-40
LED MODEL NO. JUSTIN, INC. TG10
DRIVER MODEL NO. EVERLIGHT ELECTRONICS 67-21S SERIES

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.

STATEMENT OF LIMITATION: This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the federal government.

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 LPD-40K22-40. The sample was received by Intertek on December 1, 2016, in undamaged condition and one sample was tested as received. The sample designation was AH12012016042336.

DATES OF TESTS: December 8, 2016 through December 9, 2016.

SUMMARY

Model No.:	LPD-40K22-40
Description:	LED Panel Light

	Result	
Criteria	Sphere	Goniometer
Total Lumen Output (Lumens)	4426	4253
Total Power (W)	40.10	39.94
Luminaire Efficacy (LPW)	110.4	106.5

Criteria	Result
Power Factor at 120Vac	0.961
Power Factor at 277Vac	0.945
Current ATHD % at 120Vac	9.98
Current ATHD % at 277Vac	9.44
Correlated Color Temperature (CCT - K)	3990
Color Rendering Index (CRI - Ra)	82.7
Color Rendering Index (CRI - R9)	7.2
DUV	0.002
Chromaticity Coordinate (x)	0.382
Chromaticity Coordinate (y)	0.383
Chromaticity Coordinate (u')	0.224
Chromaticity Coordinate (v')	0.504

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	12/09/16
Omega Newport Thermometer	DPI8-C24	146920	10/07/16	10/07/17	12/09/16
LSI High Speed Mirror Goniometer	6440T	146928	VBU	VBU	12/09/16
Newport Thermohygrometer	iServer	146956	01/04/16	01/04/17	12/09/16
Pacific, AC power supply	118-ACX	CHI0358	VBU	VBU	12/09/16
Labsphere Spectroradiometer	CDS1100	CHI0091	VBU	VBU	12/08/16
3 Meter Sphere	SPR600	CHI0088	VBU	VBU	12/08/16
Elgar AC Power Supply	CW1251M	146112	VBU	VBU	12/08/16
Sorenson DC Power Supply	XFR150-8	146846	VBU	VBU	12/08/16
Newport Humidity Recorder	iTHX-SD	146382	06/27/16	06/27/17	12/08/16
Yokogawa Power Meter	WT1600	146768	01/14/16	01/14/17	12/08/16
Omega Temperature Meter	MDSi8	146139	03/21/16	03/21/17	12/08/16

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 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

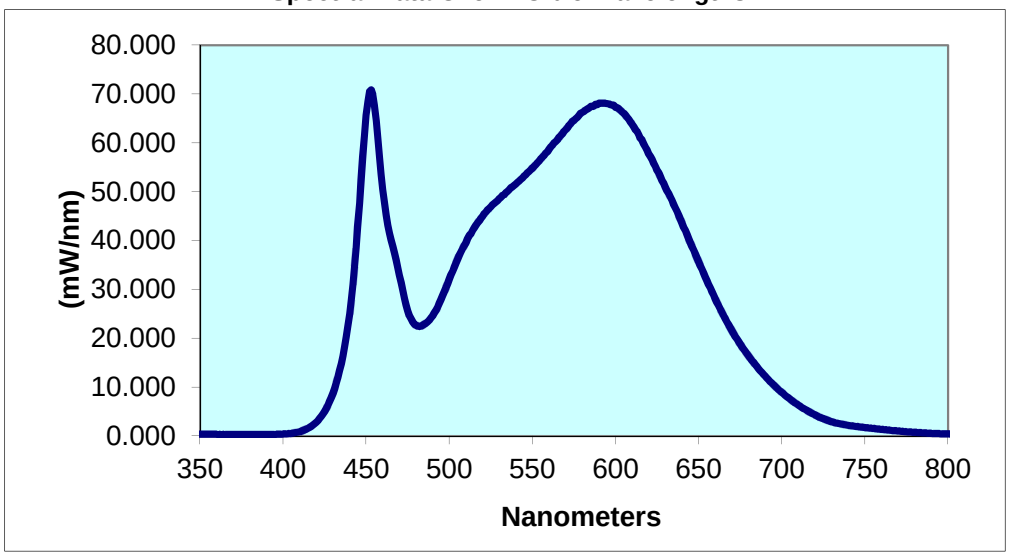
Intertek Sample No.	Base Orientation	Input Voltage {Vac}	Input Current (mA)	Input Power (Watts)	Input Power Factor	Current ATHD (%)	Luminous Flux (Lumens)	Lumen Efficacy (LPW)
AH12012016042336	Up	120.0	347.8	40.10	0.961	9.98	4426	110.4
		277.0	149.4	39.09	0.945	9.44		

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')
3990	82.7	7.2	0.002	0.382	0.383	0.224	0.504

Spectral Distribution over Visible Wavelengths

nm	mW/nm	nm	mW/nm	nm	mW/nm	nm	mW/nm	nm	mW/nm
350	0.336	440	24.97	530	48.56	620	57.84	710	6.316
355	0.322	445	42.85	535	50.07	625	54.47	715	5.237
360	0.329	450	65.66	540	51.57	630	50.97	720	4.304
365	0.301	455	67.69	545	53.21	635	47.41	725	3.524
370	0.265	460	50.48	550	54.88	640	43.57	730	2.906
375	0.257	465	40.15	555	56.76	645	39.61	735	2.486
380	0.252	470	32.93	560	58.71	650	35.64	740	2.167
385	0.245	475	25.61	565	60.65	655	31.81	745	1.937
390	0.242	480	22.67	570	62.74	660	28.13	750	1.726
395	0.295	485	22.87	575	64.60	665	24.64	755	1.530
400	0.376	490	24.61	580	66.23	670	21.56	760	1.338
405	0.547	495	27.93	585	67.43	675	18.80	765	1.164
410	0.892	500	32.13	590	68.10	680	16.38	770	1.000
415	1.580	505	36.16	595	68.02	685	14.20	775	0.855
420	2.819	510	39.55	600	67.33	690	12.23	780	0.722
425	5.045	515	42.58	605	66.03	695	10.52		
430	8.723	520	44.98	610	63.83	700	8.937		
435	14.83	525	46.94	615	60.97	705	7.541		

Spectral Data Over Visible Wavelengths



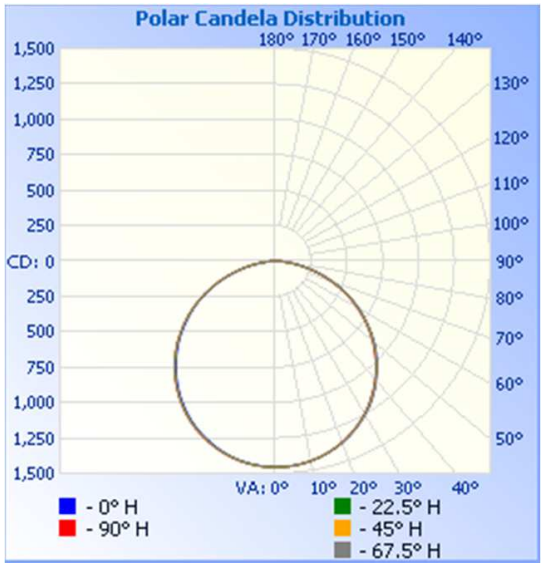
RESULTS OF TEST (cont'd)

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)
AH12012016042336	Up	120.0	334.8	39.94	0.994	4253	106.5

Intensity (Candlepower) Summary at 25°C - Candelas

Angle	0	22.5	45	67.5	90
0	1456	1456	1456	1456	1456
5	1450	1450	1451	1450	1450
10	1433	1433	1434	1433	1432
15	1406	1404	1405	1403	1402
20	1366	1363	1364	1362	1361
25	1314	1311	1312	1309	1308
30	1253	1247	1250	1247	1246
35	1181	1174	1176	1173	1170
40	1094	1090	1091	1088	1085
45	1002	997	999	994	990
50	902	897	896	892	889
55	790	786	787	782	778
60	676	670	670	665	662
65	554	548	547	543	540
70	426	422	421	416	412
75	302	297	294	290	287
80	181	177	174	170	167
85	80	76	72	71	69
90	0	0	0	0	0

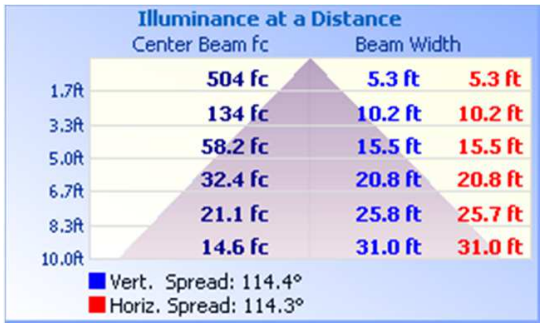


RESULTS OF TEST (cont'd)

Illumination Plots

Mounting Height: 10 ft.

Illuminance - Cone of Light



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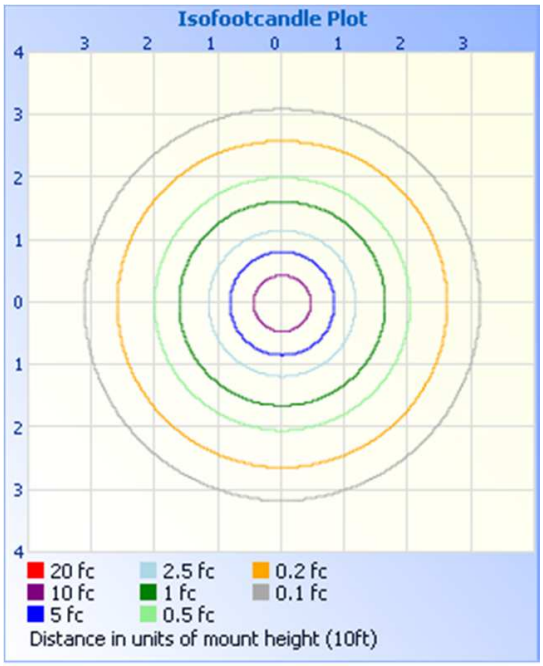

Zonal Lumen Summary and Percentages at 25°C

Zone	Lumens	% Luminaire
0-30	1136	26.7
0-40	1868	43.9
0-60	3330	78.3
60-90	923.1	21.7
0-90	4253	100.0
90-180	0.0	0.0
0-180	4253	100.0

Zonal Lumens and Percentages at 25°C

Zone	Lumens	% Luminaire
0-10	137.8	3.2
10-20	395.7	9.3
20-30	602.8	14.2
30-40	732.1	17.2
40-50	765.0	18.0
50-60	696.9	16.4
60-70	534.9	12.6
70-80	306.0	7.2
80-90	82.2	1.9

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
Engineer
Lighting Division

Attachment: None