



# REPORT

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

Project No. G102748333

Date: December 9, 2016

REPORT NO. 102748333CHI-009

TEST OF ONE LED RETROFIT KIT

MODEL NO. LRK-50K45W  
LED MODEL NO. CREE XTEAWT-00-0000-00000LBE7  
DRIVER MODEL NO. MEANWELL HLG-60H-24A

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 LRK-50K45W. 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 7, 2016 through December 9, 2016.

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SUMMARY

Model No.:	LRK-50K45W
Description:	LED Retrofit Kit

Criteria	Result	
	Sphere	Goniometer
Total Lumen Output (Lumens)	4802	4750
Total Power (W)	44.42	44.72
Luminaire Efficacy (LPW)	108.1	106.2

Criteria	Result
Power Factor at 120Vac	0.994
Power Factor at 277Vac	0.997
Current ATHD % at 120Vac	6.84
Current ATHD % at 277Vac	18.91
Correlated Color Temperature (CCT - K)	5142
Color Rendering Index (CRI - Ra)	71.3
Color Rendering Index (CRI - R9)	-16.4
DUV	0.002
Chromaticity Coordinate (x)	0.341
Chromaticity Coordinate (y)	0.345
Chromaticity Coordinate (u')	0.211
Chromaticity Coordinate (v')	0.481

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	12/07/16
3 Meter Sphere	SPR600	CHI0088	VBU	VBU	12/07/16
Elgar AC Power Supply	CW1251M	146112	VBU	VBU	12/07/16
Sorenson DC Power Supply	XFR150-8	146846	VBU	VBU	12/07/16
Newport Humidity Recorder	iTHX-SD	146382	06/27/16	06/27/17	12/07/16
Yokogawa Power Meter	WT1600	146768	01/14/16	01/14/17	12/07/16
Omega Temperature Meter	MDSi8	146139	03/21/16	03/21/17	12/07/16



## 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 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**

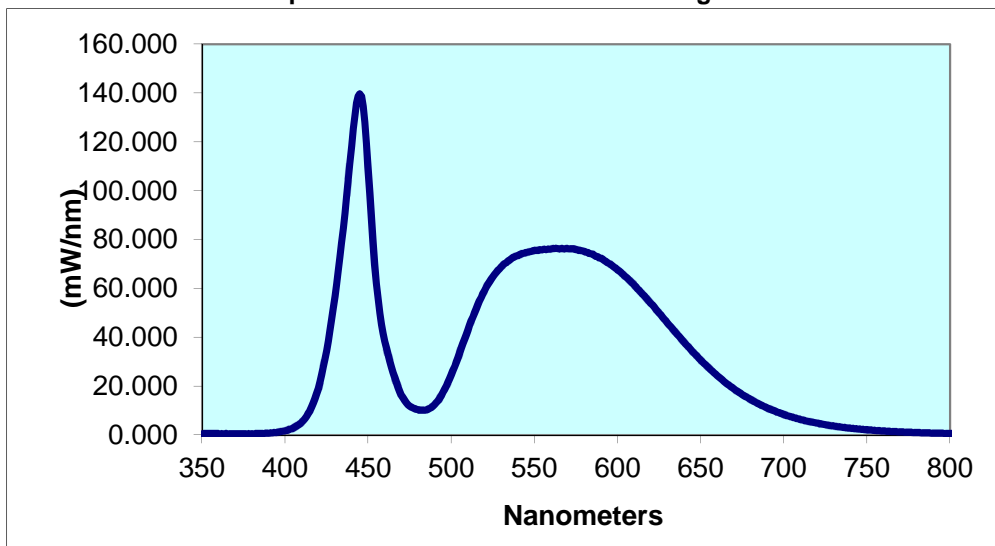
**Photometric and Electrical Measurements at Ambient Temperature (25°C +/- 1°C) - Integrating Sphere Method**

Intertek Sample No.	Base Orientation	Input Voltage {Vac}	Input Current (mA)	Input Power (Watts)	Input Power Factor	Input Current ATHD (%)	Luminous Flux (Lumens)	Lumen Efficacy (LPW)
AH12012016042336	Horizontal	120.0 277.0	372.2 171.0	44.42 44.40	0.994 0.997	6.84 18.91	4802	108.1
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')	
5142	71.3	-16.4	0.002	0.341	0.345	0.211	0.481	

**Spectral Distribution over Visible Wavelengths**

nm	mW/nm	nm	mW/nm	nm	mW/nm	nm	mW/nm	nm	mW/nm
350	0.438	440	118.4	530	68.80	620	53.91	710	6.338
355	0.495	445	139.6	535	71.60	625	49.93	715	5.516
360	0.503	450	110.0	540	73.43	630	45.93	720	4.802
365	0.481	455	61.97	545	74.76	635	41.94	725	4.175
370	0.434	460	38.37	550	75.46	640	38.01	730	3.630
375	0.446	465	25.52	555	75.89	645	34.24	735	3.154
380	0.470	470	16.31	560	76.20	650	30.69	740	2.735
385	0.553	475	11.82	565	76.20	655	27.40	745	2.382
390	0.734	480	10.33	570	76.26	660	24.32	750	2.088
395	1.092	485	10.29	575	75.85	665	21.44	755	1.819
400	1.682	490	12.50	580	75.17	670	18.88	760	1.592
405	2.885	495	17.40	585	74.01	675	16.57	765	1.394
410	5.245	500	24.68	590	72.35	680	14.55	770	1.216
415	9.989	505	33.56	595	70.11	685	12.71	775	1.063
420	19.07	510	42.84	600	67.64	690	11.08	780	0.930
425	34.66	515	51.71	605	64.76	695	9.666		
430	56.71	520	59.16	610	61.44	700	8.404		
435	84.69	525	64.82	615	57.67	705	7.300		

**Spectral Data Over Visible Wavelengths**



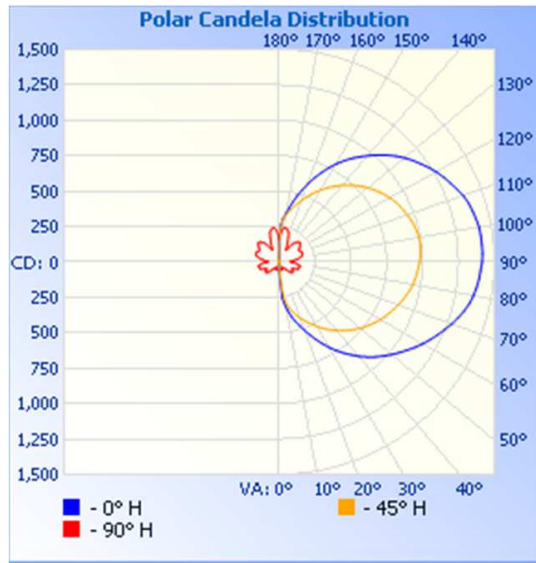
**RESULTS OF TEST (cont'd)**

**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	Horizontal	120.0	374.2	44.72	0.996	4750	106.2

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

Angle	0	22.5	45	67.5	90
0	54	54	54	54	54
5	259	250	243	241	235
10	350	349	349	345	341
15	432	439	437	431	424
20	512	519	515	507	495
25	601	602	597	585	570
30	696	690	681	665	648
35	785	775	763	744	725
40	869	855	840	820	798
45	946	930	917	895	869
50	1017	1003	989	967	940
55	1086	1073	1059	1036	1006
60	1155	1140	1125	1100	1068
65	1218	1205	1189	1161	1125
70	1279	1265	1248	1220	1182
75	1334	1319	1300	1271	1231
80	1374	1361	1343	1313	1271
85	1398	1388	1371	1340	1299
90	1414	1410	1392	1361	1319
95	1418	1418	1400	1370	1329
100	1415	1411	1394	1365	1324
105	1396	1392	1376	1348	1310
110	1367	1361	1347	1322	1284
115	1318	1317	1304	1279	1241
120	1269	1269	1255	1228	1190
125	1208	1203	1187	1160	1128
130	1144	1126	1111	1090	1060
135	1067	1043	1033	1013	983
140	983	959	949	928	902
145	897	871	857	840	818
150	802	775	763	748	729
155	699	675	665	652	637
160	590	570	564	557	548
165	483	470	470	467	461
170	386	382	385	385	383
175	313	315	316	317	317
180	159	159	159	159	159



RESULTS OF TEST (cont'd)

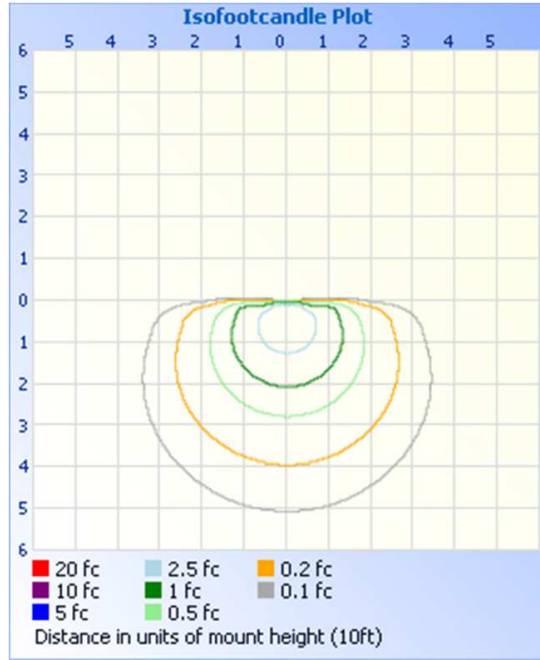
Illumination Plots

Mounting Height: 10 ft.

Illuminance - Cone of Light



Isoillumination Plot



Zonal Lumen Summary and Percentages at 25°C

Zone	Lumens	% Luminaire
0-30	157.3	3.3
0-40	326.3	6.9
0-60	906.8	19.1
60-90	1356	28.6
0-90	2263	47.6
90-180	2486.0	52.4
0-180	4750	100.0

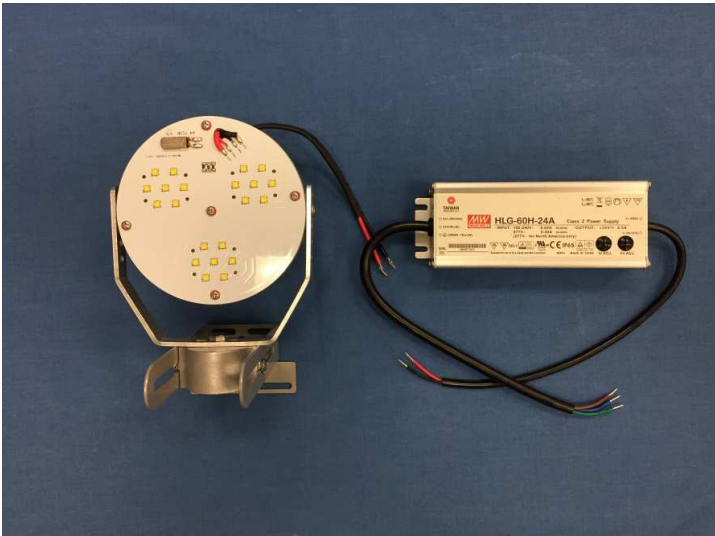
Zonal Lumens and Percentages at 25°C

Zone	Lumens	% Luminaire
0-10	9.9	0.2
10-20	47.8	1.0
20-30	99.7	2.1
30-40	168.9	3.6
40-50	250.7	5.3
50-60	329.7	6.9
60-70	401.5	8.5
70-80	461.5	9.7
80-90	493.5	10.4
90-100	505.2	10.6
100-110	491.1	10.3
110-120	441.7	9.3
120-130	370.7	7.8
130-140	286.4	6.0
140-150	195.6	4.1
150-160	117.4	2.5
160-170	60.8	1.3
170-180	17.7	0.4

Flood Summary

	Efficiency (%)	Lumens	Horizontal Spread (°)	Vertical Spread (°)
Field 10%	98.6	4684	174.4	87.3
Beam 50%	70.6	3352	120.6	123.7
Total	100.0	4751		

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:



Jehue Williams  
Associate Engineer  
Lighting Division

Attachment: None

Report Reviewed By:



Timothy Quigley  
Engineer  
Lighting Division