



FOR THE SCOPE OF
ACCREDITATION UNDER NVLAP LAB
CODE 100402-0.

REPORT

3933 US ROUTE 11, CORTLAND, NEW YORK 13045

Project No. G101555841

Date: March 21, 2014

REPORT NO. 101555841CRT-003

TEST OF ONE LED HIGHBAY

MODEL NO. SL110N-UM-PFB(DW)
LED MODEL NO. LG LEMWH51X80HZ

RENDERED TO

DONGBU LIGHTEC CO., LTD.
739-8 OJEONG-DONG OJENOG-GU
BUCHEON-SI 421-170, SOUTH KOREA

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 500511603.

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 SL110N-UM-PFB(DW). The sample was received by Intertek on March 3, 2014, in undamaged condition and one sample was tested as received. The sample designation was CRT1403031531-001-001.

DATES OF TESTS: March 14, 2014 through March 18, 2014.

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SUMMARY

Model No.:	SL110N-UM-PFB(DW)
Description:	LED Highbay

Criteria	Result	
	Sphere	Goniometer
Total Lumen Output (Lumens)	10584	10830
Total Power (W)	108.6	108.8
Luminaire Efficacy (LPW)	97.46	99.54

Criteria	Result
Power Factor at 120Vac	0.995
Power Factor at 277Vac	0.941
Current ATHD % at 120Vac	7.95
Current ATHD % at 277Vac	12.17
Correlated Color Temperature (CCT - K)	5136
Color Rendering Index (CRI - Ra)	85.7
Color Rendering Index (CRI - R9)	40.1
DUV	0.000
Chromaticity Coordinate (x)	0.341
Chromaticity Coordinate (y)	0.349
Chromaticity Coordinate (u')	0.210
Chromaticity Coordinate (v')	0.483

EQUIPMENT LIST

Equipment Used	Model Number	Control Number	Last Date Calibrated	Calibration Due Date
Yokogawa Power Analyzer	WT1600	E474	03/07/14	03/07/15
LABSPHERE 3M	W/ CDS 1100	N307	VBU	VBU
Fluke Temp Meter	53 II	T1318	03/15/13	03/15/14
Elgar Power Supply	CW1251	---	---	---
Extech Hygro-Thermometer	445703	T1366	11/27/13	11/27/14
SORENSEN POWER SUPPLY	XFR 150-8	---	VBU	VBU
NIST Spectral Flux Standard Source	RF1024	N/A	09/18/10	100 hrs of use
LSI High Speed Mirror Goniometer	6440	---	02/24/14	03/24/14
Elgar Power Supply	CW1251	---	VBU	VBU
Yokogawa Power Analyzer	WT210	E464	04/17/13	04/17/14
ExTech Hygro Thermometer	445703	T1357	11/25/13	11/25/14
Fisher Scientific	14-649-9	N1405	08/13/13	08/13/14
Mitutoyo Digital Level/Protractor	3600 950-316	N1390	12/11/13	12/11/14



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

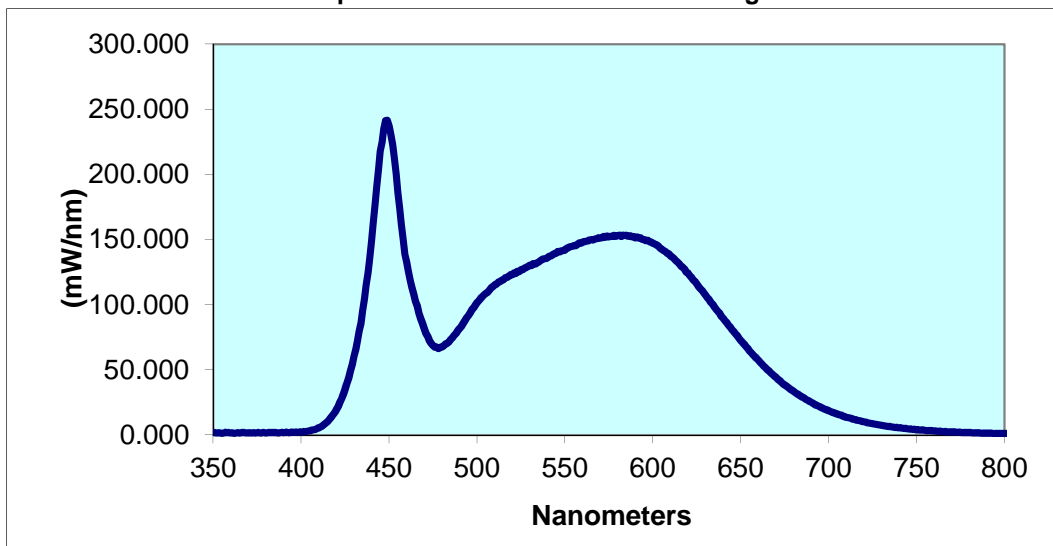
Photometric and Electrical Measurements at Ambient Temperature (25°C +/- 1°C) - Integrating Sphere Method

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)
CRT1403031531-001-001		UP	120.0	909.4	108.6	0.995	7.95	10584	97.46
			277.0	404.4	105.5	0.941	12.17		
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')		
5136	85.7	40.1	0.000	0.341	0.349	0.210	0.483		

Spectral Distribution over Visible Wavelengths

nm	mW/nm	nm	mW/nm	nm	mW/nm	nm	mW/nm	nm	mW/nm
350	1.855	440	149.100	530	130.200	620	124.100	710	13.650
355	1.356	445	217.700	535	132.700	625	116.000	715	11.810
360	1.618	450	236.800	540	136.000	630	107.100	720	10.070
365	1.570	455	186.500	545	139.700	635	98.310	725	8.751
370	1.533	460	132.100	550	142.100	640	89.580	730	7.374
375	1.852	465	102.800	555	145.300	645	80.910	735	6.314
380	1.453	470	81.490	560	148.000	650	72.380	740	5.463
385	1.814	475	68.550	565	150.000	655	64.360	745	4.714
390	1.679	480	67.710	570	151.100	660	57.250	750	4.019
395	1.909	485	73.330	575	152.100	665	50.200	755	3.442
400	2.317	490	81.640	580	153.200	670	44.220	760	2.987
405	3.209	495	91.540	585	153.200	675	38.340	765	2.599
410	5.477	500	101.800	590	151.400	680	33.350	770	2.225
415	10.410	505	108.600	595	150.000	685	29.040	775	1.906
420	19.490	510	115.300	600	147.300	690	25.010	780	1.683
425	35.560	515	119.200	605	142.500	695	21.630		
430	60.210	520	123.000	610	137.300	700	18.600		
435	95.240	525	126.800	615	131.500	705	15.940		

Spectral Data Over Visible Wavelengths



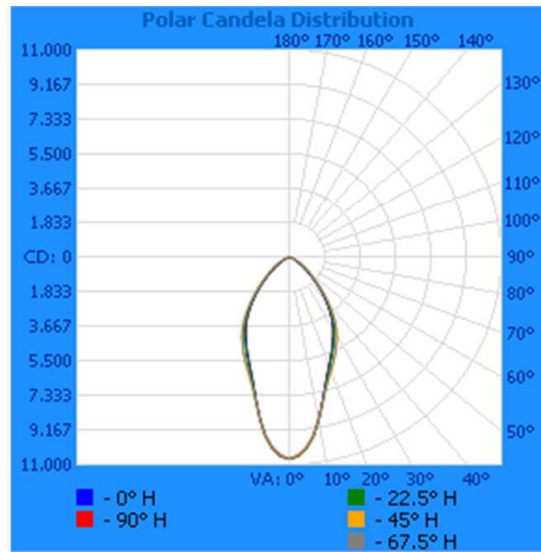
RESULTS OF TEST (cont'd)

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)
CRT1403031531-001-00	UP	120.0	910.9	108.8	0.996	10830	99.54

Intensity (Candlepower) Summary at 25°C - Candelas

Angle	0	22.5	45	67.5	90
0	10696	10696	10696	10696	10696
5	10197	10194	10176	10148	10110
10	8782	8778	8763	8732	8708
15	7144	7176	7290	7261	7139
20	6082	6120	6382	6329	6063
25	5295	5333	5647	5609	5264
30	4581	4638	4927	4899	4544
35	3797	3868	4106	4091	3768
40	2885	2966	3143	3149	2888
45	2007	2103	2243	2259	2046
50	1296	1380	1553	1540	1313
55	774	845	1093	1070	795
60	403	456	738	705	427
65	182	214	432	415	192
70	56	69	201	199	67
75	10	9	57	57	11
80	0	0	1	2	0
85	0	0	0	0	0
90	0	0	0	0	0

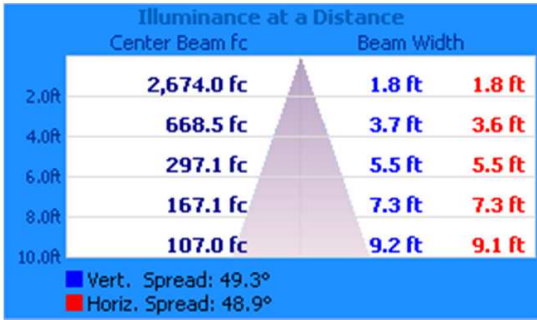


RESULTS OF TEST (cont'd)

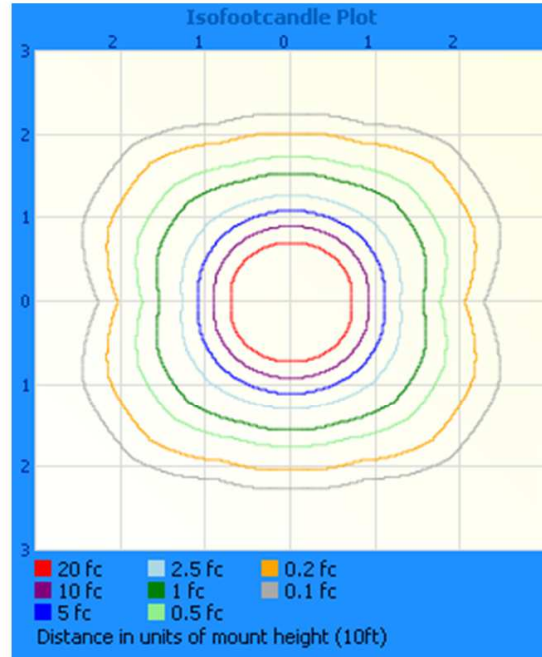
Illumination Plots

Mounting Height: 10 ft.

Illuminance - Cone of Light



Isoillumination Plot



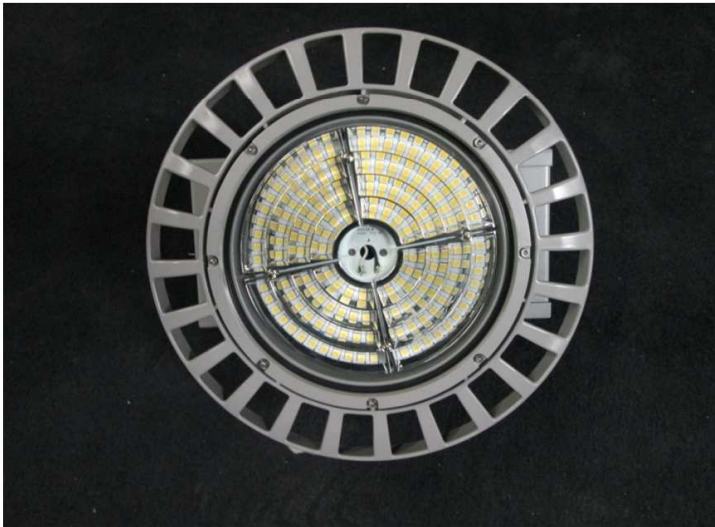
Zonal Lumen Summary and Percentages at 25°C

Zone	Lumens	% Luminaire
0-30	5469	50.5
0-40	7919	73.1
0-60	10459	96.6
60-90	370.6	3.4
0-90	10830	100.0
90-180	0.0	0.0
0-180	10830	100.0

Zonal Lumens and Percentages at 25°C

Zone	Lumens	% Luminaire
0-10	922.6	8.5
10-20	2036	18.8
20-30	2511	23.2
30-40	2450	22.6
40-50	1676	15.5
50-60	863.7	8.0
60-70	322.5	3.0
70-80	48.0	0.4
80-90	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:



Ryan Siddon
Engineer
Lighting Division

Attachment: None

Report Reviewed By:



Jeffrey Davis
Engineering Manager
Lighting Division