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-005

TEST OF ONE LED HIGHBAY

MODEL NO. SL140N-KM-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 SL140N-KM-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 CRT1403031531-001-003.

DATES OF TESTS: March 14, 2014 through March 19, 2014.

SUMMARY

Model No.:	SL140N-KM-PFB(DW)
Description:	LED Highbay

	Result	
Criteria	Sphere	Goniometer
Total Lumen Output (Lumens)	13270	13560
Total Power (W)	137.6	137.8
Luminaire Efficacy (LPW)	96.44	98.4

Criteria	Result
Power Factor at 200Vac	0.982
Power Factor at 277Vac	0.940
Current ATHD % at 200Vac	8.56
Current ATHD % at 277Vac	17.93
Correlated Color Temperature (CCT - K)	5163
Color Rendering Index (CRI - Ra)	86.1
Color Rendering Index (CRI - R9)	42.0
DUV	0.000
Chromaticity Coordinate (x)	0.341
Chromaticity Coordinate (y)	0.348
Chromaticity Coordinate (u')	0.210
Chromaticity Coordinate (v')	0.482

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

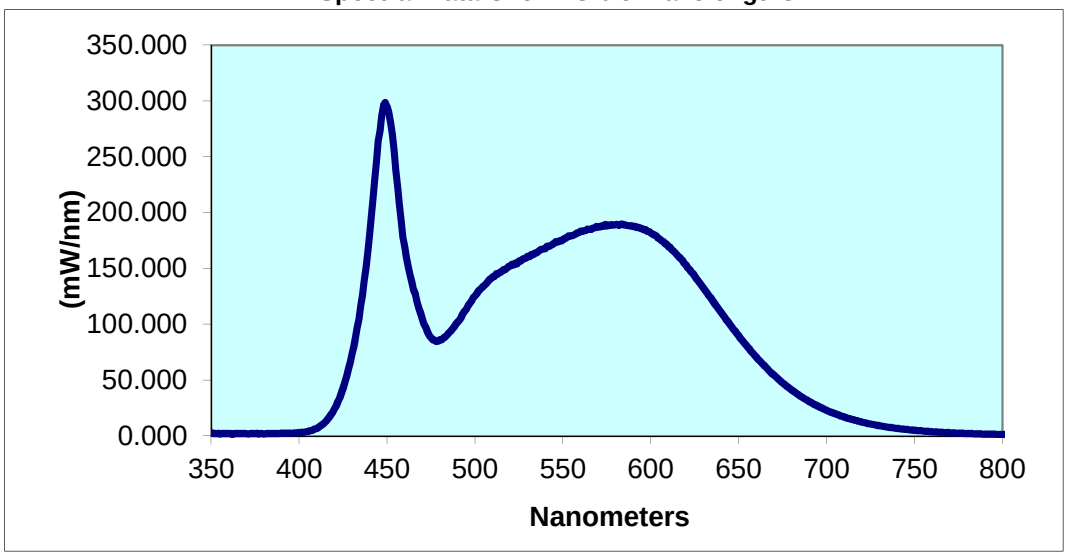
Intertek Sample No.	Base Orientation	Input Voltage {Vac}	Input Current (mA)	Input Power (Watts)	Input Power Factor	Current ATHD (%)	Luminous Flux (Lumens)	Lumen Efficacy (LPW)
CRT1403031531-001-003	UP	200.0	700.3	137.6	0.982	8.56	13270	96.44
		277.0	520.6	135.6	0.940	17.93		

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')
5163	86.1	42.0	0.000	0.341	0.348	0.210	0.482

Spectral Distribution over Visible Wavelengths

nm	mW/nm	nm	mW/nm	nm	mW/nm	nm	mW/nm	nm	mW/nm
350	2.812	440	179.800	530	160.800	620	153.200	710	16.910
355	1.872	445	264.500	535	163.900	625	143.100	715	14.590
360	1.954	450	294.700	540	167.700	630	132.200	720	12.490
365	2.151	455	238.000	545	172.500	635	121.500	725	10.720
370	2.025	460	169.500	550	175.700	640	110.400	730	9.101
375	2.168	465	131.400	555	179.500	645	99.790	735	7.784
380	1.721	470	104.800	560	183.200	650	89.450	740	6.764
385	2.086	475	88.030	565	184.900	655	79.640	745	5.800
390	2.250	480	86.000	570	186.900	660	70.420	750	4.965
395	2.408	485	92.000	575	188.200	665	62.210	755	4.299
400	2.766	490	101.700	580	189.400	670	54.560	760	3.674
405	3.984	495	113.300	585	189.000	675	47.470	765	3.160
410	6.755	500	125.700	590	187.700	680	40.950	770	2.794
415	12.930	505	134.600	595	185.500	685	35.640	775	2.397
420	24.190	510	142.600	600	181.900	690	30.860	780	2.095
425	43.370	515	147.200	605	176.300	695	26.630		
430	73.190	520	152.300	610	169.400	700	23.020		
435	115.800	525	156.700	615	162.000	705	19.810		

Spectral Data Over Visible Wavelengths



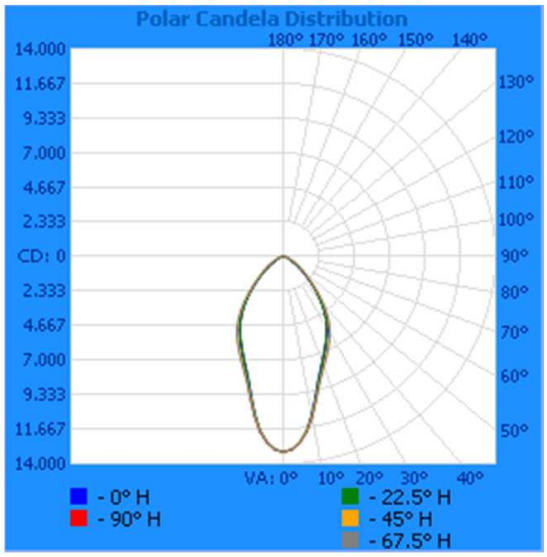
RESULTS OF TEST (cont'd)

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	200.0	699.7	137.8	0.985	13560	98.4

Intensity (Candlepower) Summary at 25°C - Candelas

Angle	0	22.5	45	67.5	90
0	13220	13220	13220	13220	13220
5	12573	12577	12586	12630	12630
10	10817	10862	10922	10970	10984
15	8798	8855	9026	9086	8990
20	7538	7544	7845	7877	7629
25	6602	6578	6948	6977	6610
30	5798	5756	6130	6145	5728
35	4832	4792	5141	5173	4807
40	3708	3698	3967	4005	3761
45	2604	2615	2817	2842	2681
50	1706	1716	1955	1945	1718
55	1028	1026	1362	1367	1014
60	543	536	903	914	551
65	264	250	530	542	262
70	92	84	241	258	93
75	15	14	70	78	19
80	0	0	3	5	0
85	0	0	0	0	0
90	0	0	0	0	0

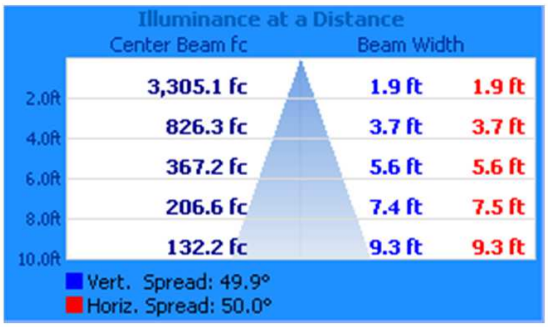


RESULTS OF TEST (cont'd)

Illumination Plots

Mounting Height: 10 ft.

Illuminance - Cone of Light



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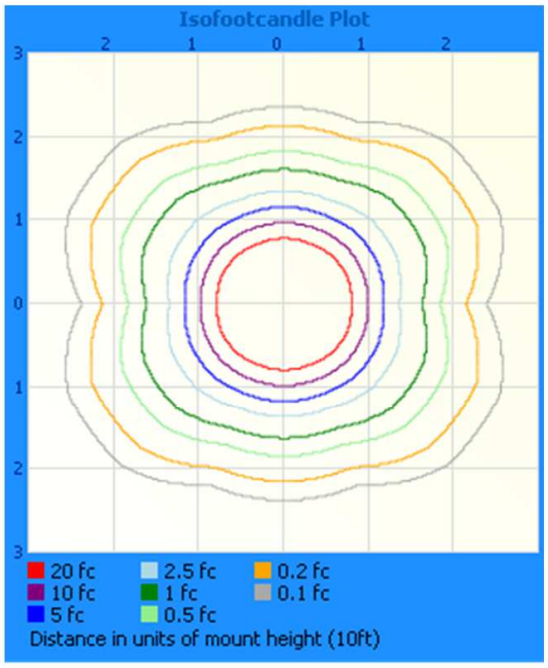

Zonal Lumen Summary and Percentages at 25°C

Zone	Lumens	% Luminaire
0-30	6793	50.1
0-40	9876	72.8
0-60	13089	96.5
60-90	471.3	3.5
0-90	13560	100.0
90-180	0.0	0.0
0-180	13560	100.0

Zonal Lumens and Percentages at 25°C

Zone	Lumens	% Luminaire
0-10	1146	8.4
10-20	2530	18.7
20-30	3118	23.0
30-40	3082	22.7
40-50	2124	15.7
50-60	1089	8.0
60-70	407.8	3.0
70-80	63.2	0.5
80-90	0.3	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:

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Report Reviewed By:

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Engineering Manager
Lighting Division

Attachment: None