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

VERBATIM AMERICAS

TEST REPORT

SCOPE OF WORK
Electrical and Photometric tests as required to the IESNA test standard.

MODEL NUMBER
LED HIGHBAY UHB-150W-C50-P

PROJECT NUMBER
G102710907

REPORT NUMBER
102710907CRT-034

ISSUE DATE
March 7, 2018

REVISION DATE
None

PAGES
10

DOCUMENT CONTROL NUMBER
TBD

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TEST REPORT

REPORT NO.: 102710907CRT-034
REPORT DATE: March 7, 2018

TEST OF (1) ROUND HIGH BAY

MODEL NO. LED HIGHBAY UHB-150W-C50-P

RENDERED TO:

VERBATIM AMERICAS
8210 UNIVERSITY EXECUTIVE PARK DRIVE, SUITE 300
CHARLOTTE, NC 28262

STATEMENT OF LIMITATION

NVLAP Lab Code 100402-0. 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-00707669.

STANDARDS USED

IESNA LM-79 - 2008: Electrical and Photometric Measurements of Solid State Lighting
ANSI NEMA ANSLG C78.377: 2015: Specifications of the Chromaticity of Solid State Lighting Products

SAMPLE INFORMATION

CONTROL NO.	MODEL/SERIAL NO.	DESCRIPTION	TYPE	RECEIVED
CRT1802281548-003	LED HIGHBAY UHB-150W-C50-P	Luminaire	Production	02/28/18

DATE OF TESTS

March 5, 2018 through March 7, 2018.

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TEST REPORT

REPORT NO.: 102710907CRT-034
REPORT DATE: March 7, 2018

SUMMARY

MODEL NO:	LED HIGHBAY UHB-150W-C50-P
DESCRIPTION:	Round High Bay
PART NO:	70168

CRITERIA	RESULTS	
	INTEGRATING SPHERE	GONIOPHOTOMETER
Lumen Output (lumens)	18496	18982
Input Power (W) @ 100 (VAC)	147.8	147.7
Lumen Efficacy (lm/W)	125.1	128.5
Input Power Factor ( ) @ 100 (VAC)	0.995	0.996

CRITERIA	RESULTS
Input Current ATHD (%) @ 100 (VAC)	7.54
Correlated Color Temperature (K)	5095
Color Rendering Index - Ra ( )	83.3
Color Rendering - R9 ( )	6.2
DUV ( )	0.0001
Chromaticity Coordinate (x)	0.343
Chromaticity Coordinate (y)	0.351
Chromaticity Coordinate (u')	0.210
Chromaticity Coordinate (v')	0.484
Input Power Factor ( ) @ 277 (VAC)	0.920
Input Current ATHD (%) @ 277 (VAC)	13.56

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EQUIPMENT LIST

EQUIPMENT USED	MODEL NO.	CONTROL NO.	LAST CAL DATE	CAL DUE DATE
LSI High Speed Mirror Goniometer	6440	---	02/09/18	03/09/18
Elgar AC Power Supply	CW1251	---	VBU	VBU
Sorenson DC Power Supply	XG 150-10	---	VBU	VBU
Yokogawa Power Analyzer	WT210	E464	05/02/17	05/02/18
Omega Thermometer	DPi8-C24	M263	05/02/17	05/02/18
M-D Building Products Digital Level	Smart Tool	L112	04/04/17	04/04/18
NIST Luminous Intensity Standard Source	NBS10322	N1427	01/09/17	01/09/19
NIST Luminous Intensity Standard Source	NBS10332	N1435	01/09/17	01/09/19
NIST Luminous Intensity Standard Source	NBS10265	N1437	01/09/17	01/09/19
NIST Luminous Flux Standard Source	NBS10428	N1424	01/11/17	01/11/19
Elgar AC Power Supply	CW1251	---	VBU	VBU
Sorenson DC Power Supply	XFR 150-8	---	VBU	VBU
Yokogawa Power Analyzer	WT1600	E474	05/04/17	05/04/18
Fluke Thermometer	53 II	T1318	03/31/17	03/31/18
Fluke Multimeter	87V	D590	04/28/17	04/28/18
3M Integrating Sphere Spectrometer System	CDS 1100	---	03/01/18	04/01/18
Fisher Scientific Stopwatch	14-649-9	N1132	02/15/18	02/15/19
Secondary Spectral Intensity Standard Source	BS5186	RF5186	01/28/18	01/28/19
Secondary Luminous Flux Standard Source	BS3616	--	01/28/18	01/28/19
Secondary Luminous Flux Standard Source	BS4116	--	01/28/18	01/28/19
Secondary Luminous Flux Standard Source	6836	--	01/28/18	01/28/19

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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 Spectroradiometer and integrating sphere were used to measure light output, correlated color temperature, chromaticity coordinates, color rendering index, and the spectral distribution 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. Stabilization procedures to LM-79 were followed. Electrical measurements including voltage, current, and power were measured using a 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 Type C Mirror Goniometer was used to measure the intensity (candelas) at each angle of distribution for the SSL sample.

Ambient temperature was measured equal to the height of the sample mounted on the goniometer equipment. The SSL sample was operated on the client provided driver at rated input volts in its designated orientation. The SSL sample was allowed to stabilize for at least thirty minutes before measurements were made. Stabilization procedures to LM-79 were followed. Electrical measurements including voltage, current, and power were measured using a power analyzer.

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TEST REPORT

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RESULTS OF TESTS

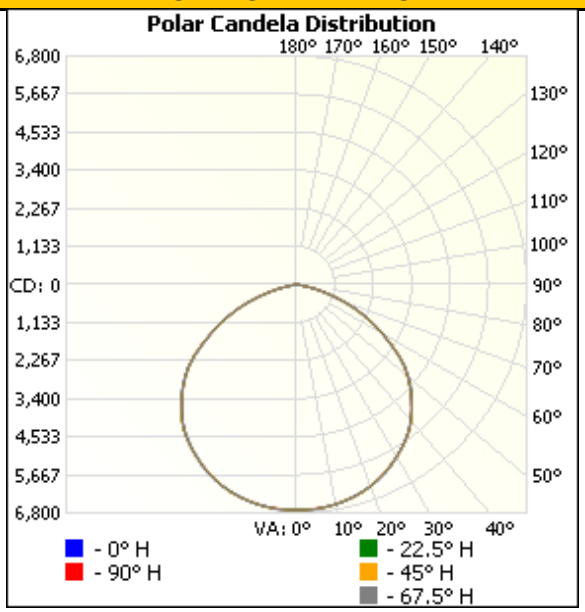
PHOTOMETRIC AND ELECTRICAL MEASUREMENTS - DISTRIBUTION METHOD (25°C +/- 1°C)

INTERTEK CONTROL NO.	BASE POSITION	INPUT VOLTAGE (VAC)	INPUT CURRENT (mA)	INPUT POWER (W)	INPUT POWER FACTOR ( )	LIGHT OUTPUT (lm)	LUMEN EFFICACY (lm/W)
CRT1802281548-003	Base Up	100.04	1482.3	147.7	0.996	18982	128.5

INTENSITY SUMMARY - CANDELAS

Angle	0	22.5	45	67.5	90
0	6707	6707	6707	6707	6707
5	6702	6698	6698	6709	6687
10	6637	6639	6633	6633	6638
15	6528	6535	6543	6543	6535
20	6382	6383	6384	6389	6379
25	6183	6173	6170	6177	6164
30	5906	5914	5918	5914	5917
35	5616	5621	5625	5628	5624
40	5261	5270	5280	5250	5260
45	4802	4819	4801	4803	4798
50	4314	4300	4288	4296	4305
55	3684	3694	3700	3684	3702
60	2933	2937	2929	2948	2948
65	2233	2233	2204	2232	2246
70	1508	1508	1521	1524	1537
75	809	808	806	811	836
80	274	277	277	280	283
85	10	12	12	12	12
90	0	0	0	0	0

POLAR CANDELA PLOT



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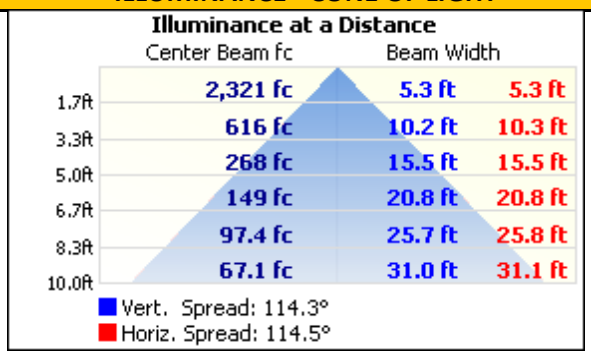
RESULTS OF TESTS

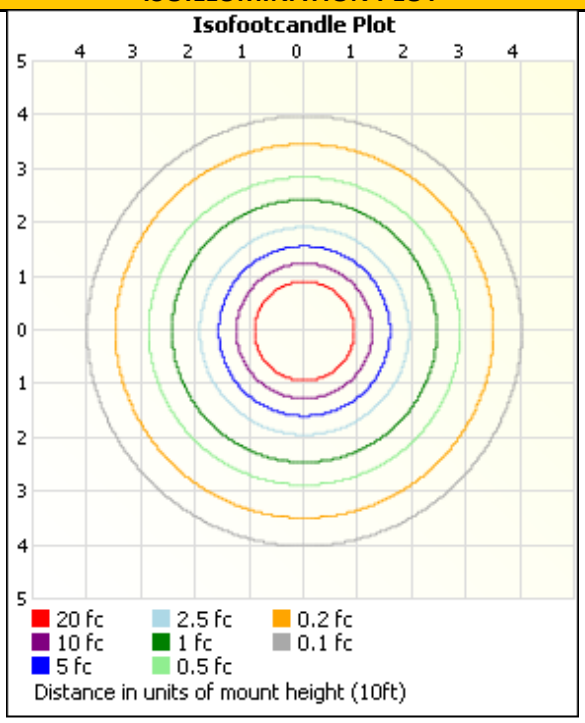
PHOTOMETRIC AND ELECTRICAL MEASUREMENTS - DISTRIBUTION METHOD (25°C +/- 1°C)

MOUNTING HEIGHT: 10ft

ILLUMINANCE - CONE OF LIGHT



ISOILLUMINATION PLOT



ZONAL LUMEN SUMMARY AND PERCENTAGES

ZONE	LUMENS	% LUMINAIRE
0-30	5329.5	28.1
0-40	8845.8	46.6
0-60	15821.1	83.4
60-90	3160.4	16.6
0-90	18981.5	100.0
90-180	0.0	0.0
0-180	18981.5	100.0

ZONE	LUMENS	% LUMINAIRE
0-10	637.3	3.4
10-20	1845.9	9.7
20-30	2846.2	15.0
30-40	3516.3	18.5
40-50	3704.1	19.5
50-60	3271.2	17.2
60-70	2202.1	11.6
70-80	888.5	4.7
80-90	69.8	0.4

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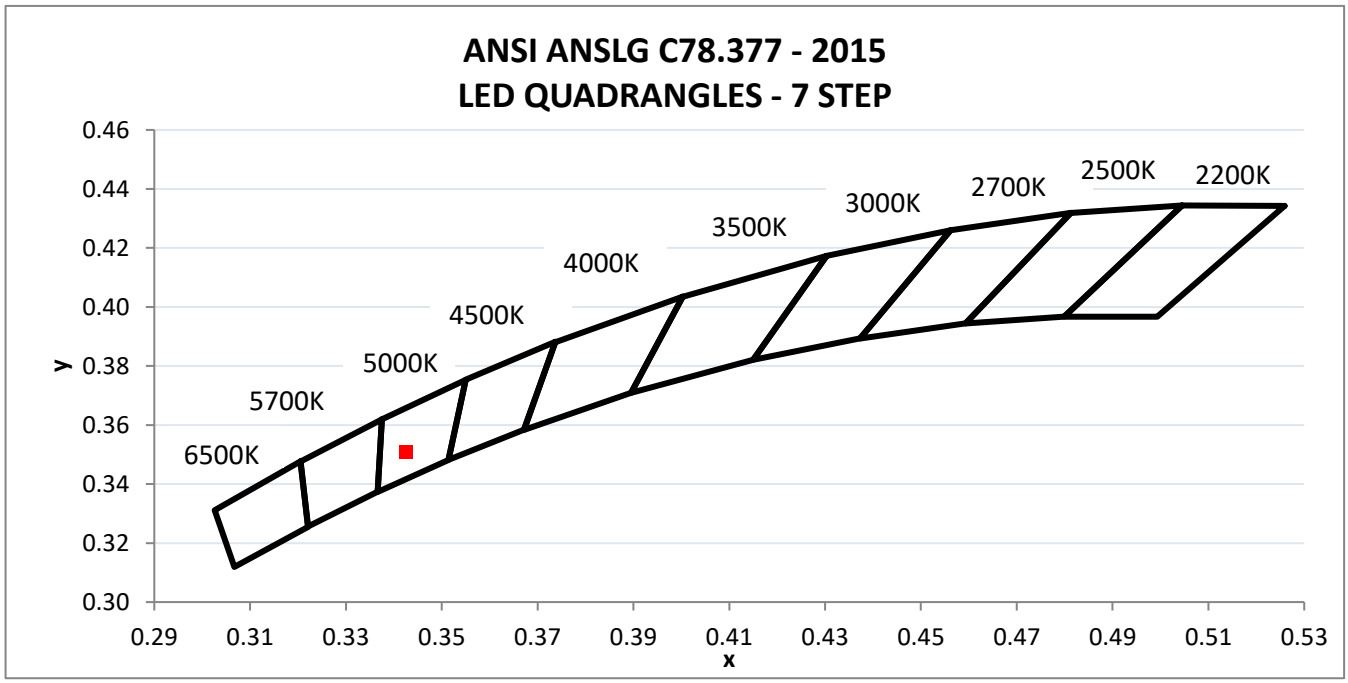
RESULTS OF TESTS

PHOTOMETRIC AND ELECTRICAL MEASUREMENTS - INTEGRATING SPHERE METHOD (25°C +/- 1°C)

INTERTEK CONTROL NO.	BASE POSITION	INPUT VOLTAGE (VAC)	INPUT CURRENT (mA)	INPUT POWER (W)	INPUT POWER FACTOR ( )	INPUT CURRENT ATHD (%)
CRT1802281548-003	Base Up	100.00	1485.5	147.84	0.995	7.54
		277.02	558.7	142.37	0.920	13.56

LIGHT OUTPUT (lm)	LUMEN EFFICACY (lm/W)	CORRELATED COLOR TEMPERATURE - CCT (K)	CRI - Ra ( )	CRI - R9 ( )	DUV ( )
18496	125.1	5095	83.3	6.2	0.0001

CIE 1931 CHROMATICITY COORDINATE (x)	CIE 1931 CHROMATICITY COORDINATE (y)	CIE 1976 CHROMATICITY COORDINATE (u')	CIE 1976 CHROMATICITY COORDINATE (v')
0.343	0.351	0.210	0.484



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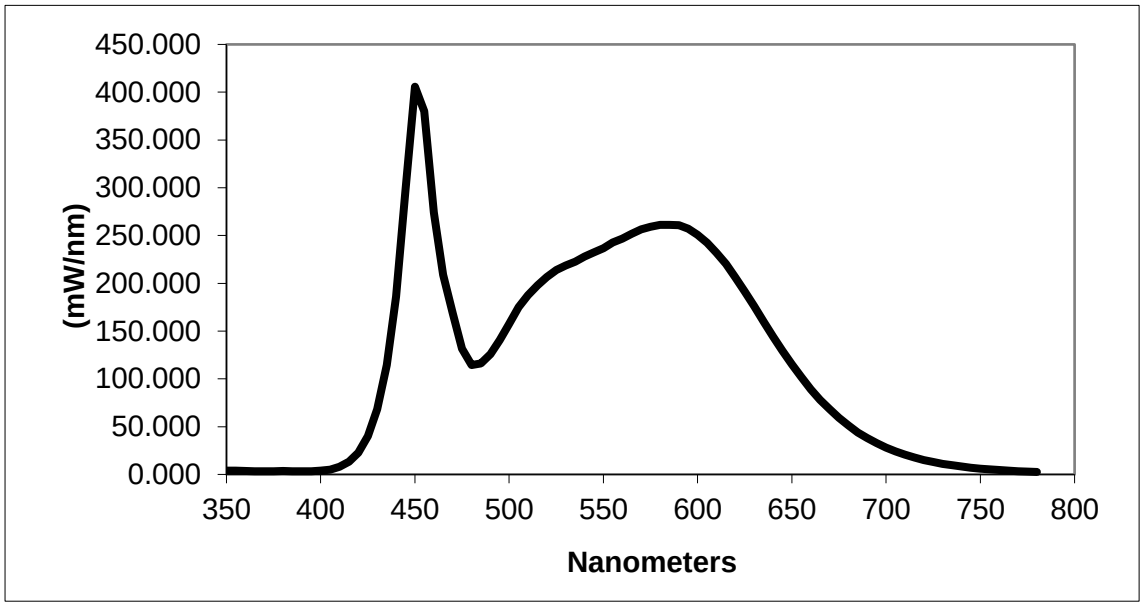
RESULTS OF TESTS

PHOTOMETRIC AND ELECTRICAL MEASUREMENTS - INTEGRATING SPHERE METHOD (25°C +/- 1°C)

SPECTRAL DISTRIBUTION OVER VISIBLE WAVELENGTHS*							
nm	mW/nm	nm	mW/nm	nm	mW/nm	nm	mW/nm
350	3.946	460	274.208	570	256.317	680	51.037
355	3.924	465	208.967	575	259.163	685	43.929
360	3.573	470	168.646	580	261.239	690	37.985
365	3.364	475	131.694	585	261.177	695	32.875
370	3.279	480	114.470	590	260.948	700	28.136
375	3.415	485	116.251	595	257.074	705	24.088
380	3.503	490	125.757	600	250.809	710	20.658
385	3.422	495	140.576	605	242.451	715	17.666
390	3.204	500	157.277	610	232.178	720	15.169
395	3.375	505	175.063	615	220.393	725	13.059
400	3.847	510	187.400	620	206.194	730	11.087
405	4.879	515	198.029	625	191.251	735	9.528
410	7.841	520	206.693	630	176.225	740	8.196
415	13.286	525	213.861	635	159.799	745	7.117
420	22.814	530	218.488	640	144.315	750	6.118
425	40.072	535	222.812	645	129.517	755	5.267
430	68.322	540	227.899	650	115.267	760	4.562
435	114.362	545	232.383	655	102.123	765	3.959
440	186.195	550	236.555	660	89.117	770	3.433
445	296.123	555	242.667	665	78.140	775	2.998
450	405.743	560	246.695	670	68.174	780	2.587
455	380.033	565	251.822	675	59.066		

*Without correction of sample absorption.



End Of Test Results

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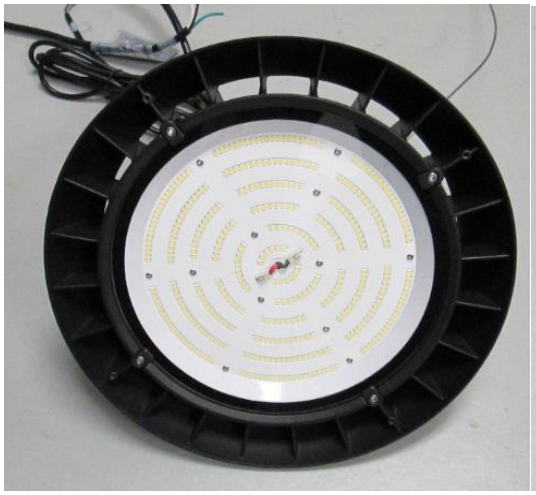
PICTURES



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:

Melanie Brittain

Melanie Brittain
Associate Engineer
Lighting Division

Report Reviewed By:

Ryan Siddon

Ryan Siddon
Project Engineer
Lighting Division

Attachments: IES File

REVISION HISTORY

JOB NUMBER	DATE OF REVISION	PROJECT HANDLER	REVIEWED BY	REVISION NOTE
None				