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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-200W-C50-P

PROJECT NUMBER
G102710907

REPORT NUMBER
102710907CRT-035

ISSUE DATE
March 7, 2018

REVISION DATE
None

PAGES
10

DOCUMENT CONTROL NUMBER
TBD
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TEST REPORT

REPORT NO.: 102710907CRT-035
REPORT DATE: March 7, 2018

TEST OF (1) ROUND HIGH BAY

MODEL NO. LED HIGHBAY UHB-200W-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
CRT1802281548-001	LED HIGHBAY UHB-200W-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-035
REPORT DATE: March 7, 2018

SUMMARY

MODEL NO:	LED HIGHBAY UHB-200W-C50-P
DESCRIPTION:	Round High Bay
PART NO:	70169

CRITERIA	RESULTS	
	INTEGRATING SPHERE	GONIOPHOTOMETER
Lumen Output (lumens)	23638	24393
Input Power (W) @ 100 (VAC)	197.7	196.3
Lumen Efficacy (lm/W)	119.6	124.3
Input Power Factor ( ) @ 100 (VAC)	0.998	0.998

CRITERIA	RESULTS
Input Current ATHD (%) @ 100 (VAC)	4.31
Correlated Color Temperature (K)	5210
Color Rendering Index - Ra ( )	83.9
Color Rendering - R9 ( )	9.2
DUV ( )	0.0000
Chromaticity Coordinate (x)	0.339
Chromaticity Coordinate (y)	0.348
Chromaticity Coordinate (u')	0.209
Chromaticity Coordinate (v')	0.482
Input Power Factor ( ) @ 277 (VAC)	0.932
Input Current ATHD (%) @ 277 (VAC)	10.27

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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

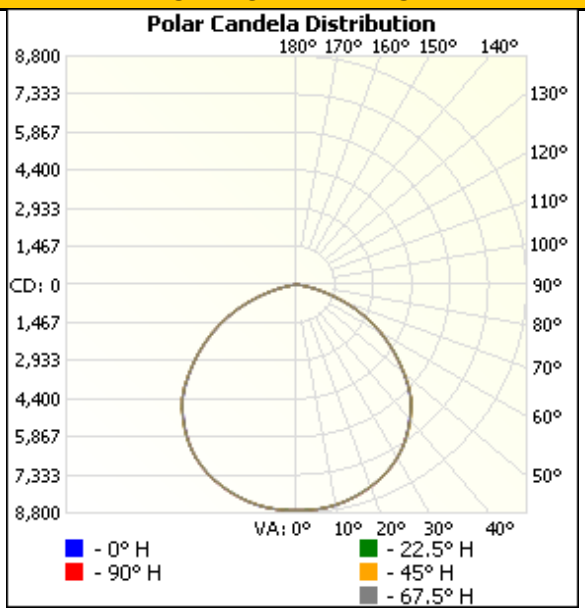
PHOTOMETRIC AND ELECTRICAL MEASUREMENTS - DISTRIBUTION METHOD (25°C +/- 1°C)

INTERTEK CONTROL NO.	BASE POSITION	INPUT VOLTAGE (VAC)	INPUT CURRENT (mA)	INPUT POWER (W)	INPUT POWER FACTOR ( )	LIGHT OUTPUT (lm)	LUMEN EFFICACY (lm/W)
CRT1802281548-001	Base Up	100.06	1965.5	196.3	0.998	24393	124.3

INTENSITY SUMMARY - CANDELAS

Angle	0	22.5	45	67.5	90
0	8701	8701	8701	8701	8701
5	8685	8684	8685	8693	8690
10	8621	8613	8612	8619	8614
15	8474	8466	8476	8477	8477
20	8281	8274	8274	8275	8287
25	8031	8023	8029	8030	8035
30	7692	7697	7691	7697	7708
35	7266	7275	7271	7265	7258
40	6735	6757	6764	6749	6745
45	6151	6180	6172	6171	6177
50	5370	5390	5397	5392	5392
55	4551	4580	4542	4553	4567
60	3711	3738	3724	3724	3735
65	2846	2858	2866	2866	2862
70	1926	1953	1957	1954	1974
75	1077	1088	1090	1097	1103
80	410	415	411	410	418
85	42	45	43	47	44
90	0	0	0	0	0

POLAR CANDELA PLOT



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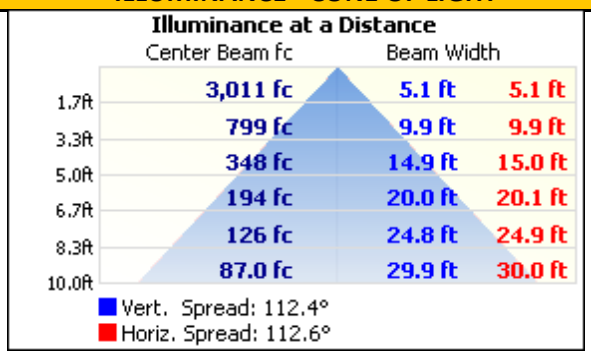
RESULTS OF TESTS

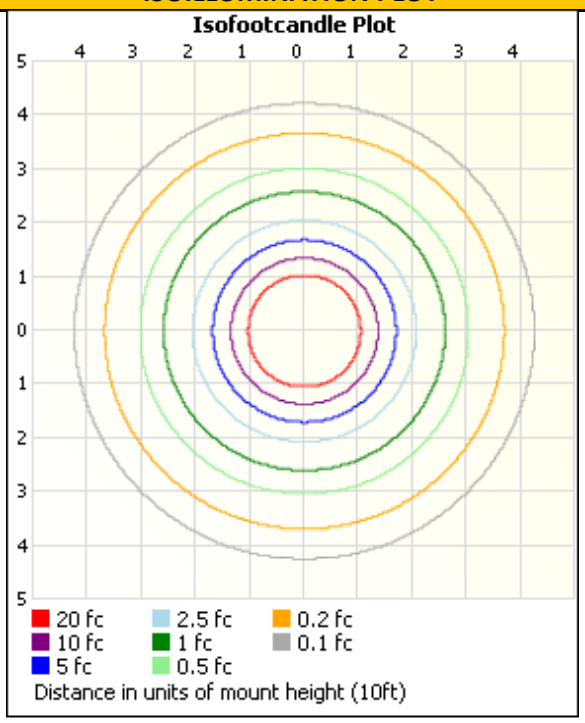
PHOTOMETRIC AND ELECTRICAL MEASUREMENTS - DISTRIBUTION METHOD (25°C +/- 1°C)

MOUNTING HEIGHT: 10ft

ILLUMINANCE - CONE OF LIGHT



ISOILLUMINATION PLOT



ZONAL LUMEN SUMMARY AND PERCENTAGES

ZONE	LUMENS	% LUMINAIRE
0-30	6920.5	28.4
0-40	11463.2	47.0
0-60	20269.9	83.1
60-90	4123.3	16.9
0-90	24393.2	100.0
90-180	0.0	0.0
0-180	24393.2	100.0

ZONE	LUMENS	% LUMINAIRE
0-10	826.8	3.4
10-20	2393.8	9.8
20-30	3699.9	15.2
30-40	4542.6	18.6
40-50	4732.7	19.4
50-60	4074.1	16.7
60-70	2822.7	11.6
70-80	1181.4	4.8
80-90	119.1	0.5

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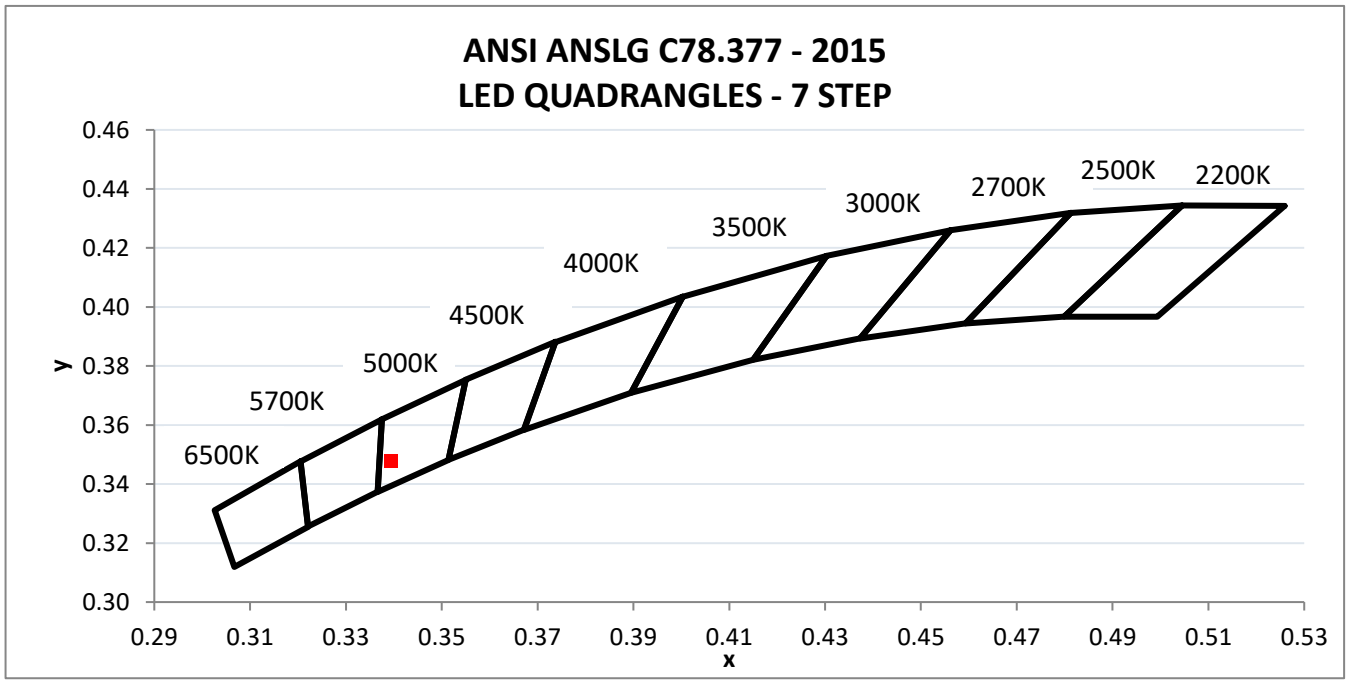
RESULTS OF TESTS

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 (%)
CRT1802281548-001	Base Up	100.01	1981.7	197.7	0.998	4.31
		277.02	733.4	189.4	0.932	10.27

LIGHT OUTPUT (lm)	LUMEN EFFICACY (lm/W)	CORRELATED COLOR TEMPERATURE - CCT (K)	CRI - Ra ( )	CRI - R9 ( )	DUV ( )
23637.5	119.6	5210	83.9	9.2	0.0000

CIE 1931 CHROMATICITY COORDINATE (x)	CIE 1931 CHROMATICITY COORDINATE (y)	CIE 1976 CHROMATICITY COORDINATE (u')	CIE 1976 CHROMATICITY COORDINATE (v')
0.339	0.348	0.209	0.482



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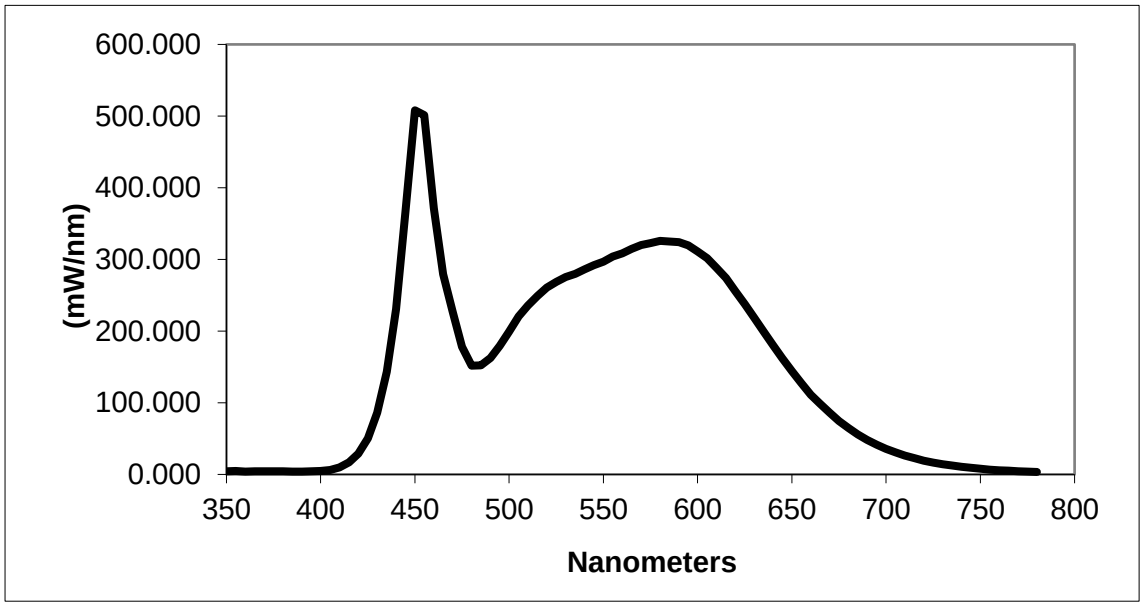
RESULTS OF TESTS

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	4.531	460	371.562	570	319.949	680	64.591
355	4.761	465	279.258	575	322.943	685	55.903
360	3.991	470	226.692	580	326.078	690	48.372
365	4.449	475	178.035	585	324.874	695	41.482
370	4.396	480	151.627	590	324.159	700	35.663
375	4.500	485	152.393	595	319.654	705	30.728
380	4.268	490	162.321	600	311.298	710	26.321
385	4.017	495	179.457	605	301.662	715	22.577
390	3.878	500	199.082	610	288.578	720	19.345
395	4.210	505	220.694	615	274.157	725	16.633
400	4.777	510	235.821	620	255.984	730	14.232
405	6.234	515	249.248	625	237.659	735	12.233
410	9.818	520	260.583	630	218.748	740	10.494
415	16.871	525	268.622	635	199.118	745	9.142
420	28.951	530	275.367	640	180.445	750	7.812
425	50.498	535	279.838	645	161.909	755	6.692
430	86.094	540	286.265	650	144.155	760	5.911
435	143.359	545	291.781	655	127.658	765	5.112
440	230.962	550	296.661	660	111.291	770	4.380
445	365.231	555	304.004	665	98.521	775	3.872
450	508.041	560	308.384	670	86.041	780	3.443
455	501.179	565	314.699	675	74.518		

*Without correction of sample absorption.



End Of Test Results

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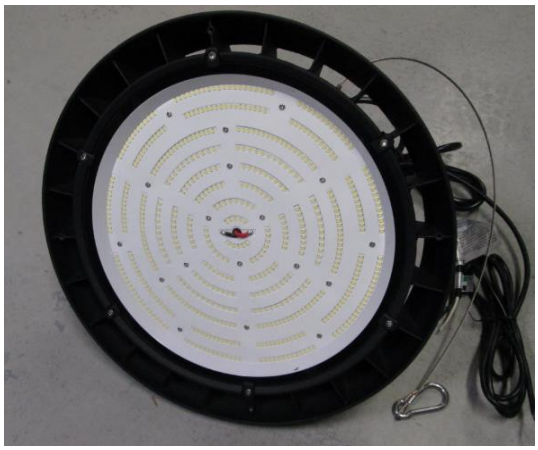
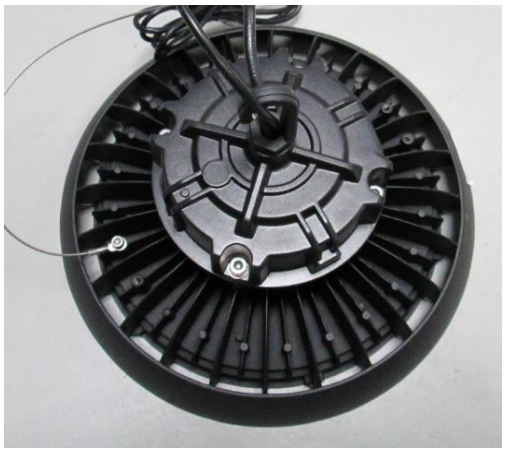
PICTURES

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				