



8165 E Kaiser Blvd. Anaheim, CA 92808
 p. 714.282.2270
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Test #: L12131202R01

Date: 2/24/2014



NVLAP LAB CODE 200927-0

Test Report: L12131202R01

Model Number: AQHBx12557CA-US

Report Prepared For: Aqualuma
 Unit 4/54 Siganto Drv. Helensvale 4212 QLD - Australia

Test: Electrical and Photometric tests as required by the IESNA test standards.

Standards Used: Appropriate part or all test guidelines were used for test performed:
IESNA LM79: 2008 Approved Methods for Electrical and Photometric Measurements of Solid-State Lighting Products
ANSI NEMA ANSLG C78.377: 2008 Specification of the Chromaticity of Solid State Lighting Products
ANSI C82.77:2002: Harmonic Emission Limits-Related Quality Requirements for Lighting Equipment

Description of Sample: Client submitted the sample. Fixture catalog number is AQHBx12557CA-US. Received in working and undamaged condition. No modifications were necessary.

Testing Condition: Fixture is tested with no special conditions.

Sample Arrival Date: 12/2/13

Date of Tests: 12/11/13 - 12/11/13

Seasoning of Sample SSL: No seasoning was performed in accordance with IESNA LM-79.

Equipment List

Equipment Used	Model No	Stock No	Calibration Due Date
Chroma Programmable AC Source	61604	PS-AC02	--
Yokogawa Digital Power Meter	WT210	MT-EL06-S1	01/04/14
Xitron Power Analysis System	2503AH	MT-EL01	01/09/14
Fluke Digital Thermometer	52k/J	MT-TP02-GC	01/04/14
LLI Type C Goniophotometer System	RMG-C-MKII	CD-LL04-GC	--
LLI 2M Sphere	2MR97	CD-SN03-S2	--
LLI Spectroradiometer	SPR-3000	MT-SC01-S2	Before Use

*All Results in accordance to IESNA LM-79-2008: Approved Method for the Electrical and Photometric Testing of Solid-State Lighting.

LM-79 Test Summary

Manufacturer:	Aqualuma
Model Number:	AQHBx12557CA-US
LAMPCAT:	N/A
Driver Model Number:	MEANWELL HLG-185H-48A
Total Lumens:	17428.19
Input Voltage (VAC/60Hz):	120.00
Input Current (Amp):	1.08
Input Power (W):	128.55
Input Power Factor:	0.99
Total Harmonic Distortion @ 120V(%):	8%
Total Harmonic Distortion @ 277V(%):	N/A
Efficacy:	136
Color Rendering Index (CRI):	70
Correlated Color Temperature (K):	5214
Chromaticity Coordinate x:	0.3400
Chromaticity Coordinate y:	0.3585
Ambient Temperature (°F):	77.0
Stabilization Time (Hours):	0:35
Total Operating Time (Hours):	1:00
Off State Power(W):	0.00

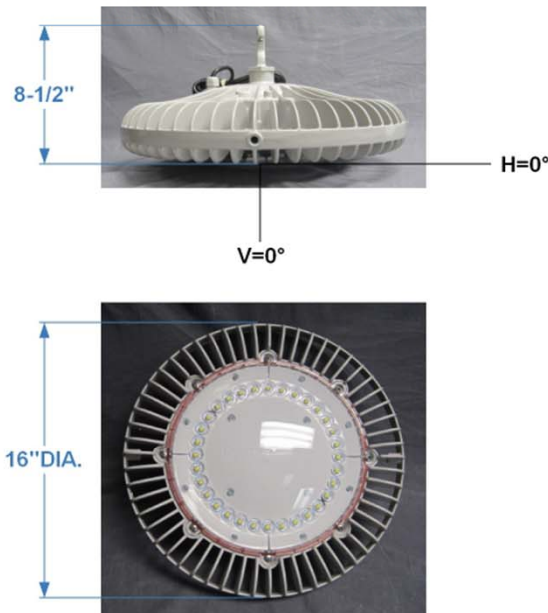
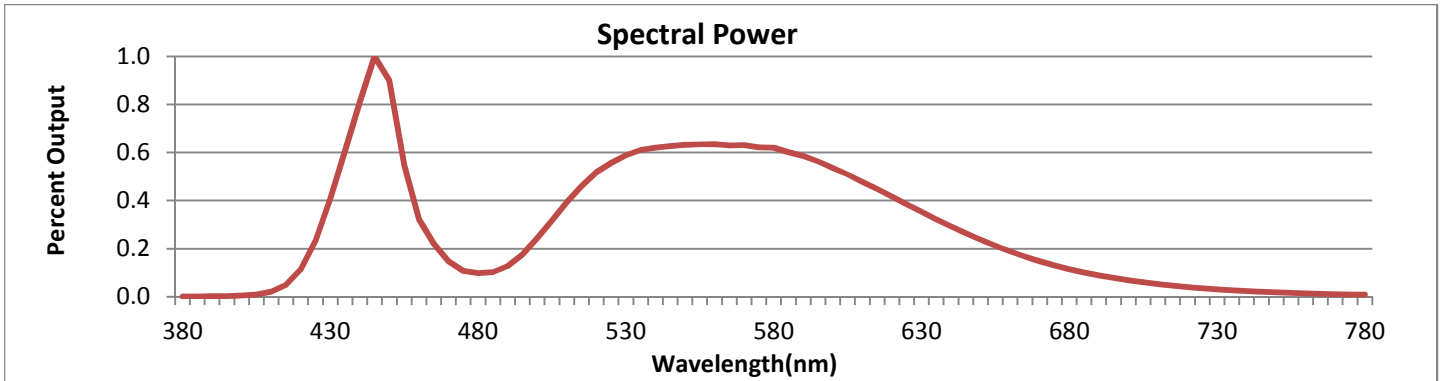


FIG.1 LUMINAIRE

*All Results in accordance to IESNA LM-79-2008: Approved Method for the Electrical and Photometric Testing of Solid-State Lighting.



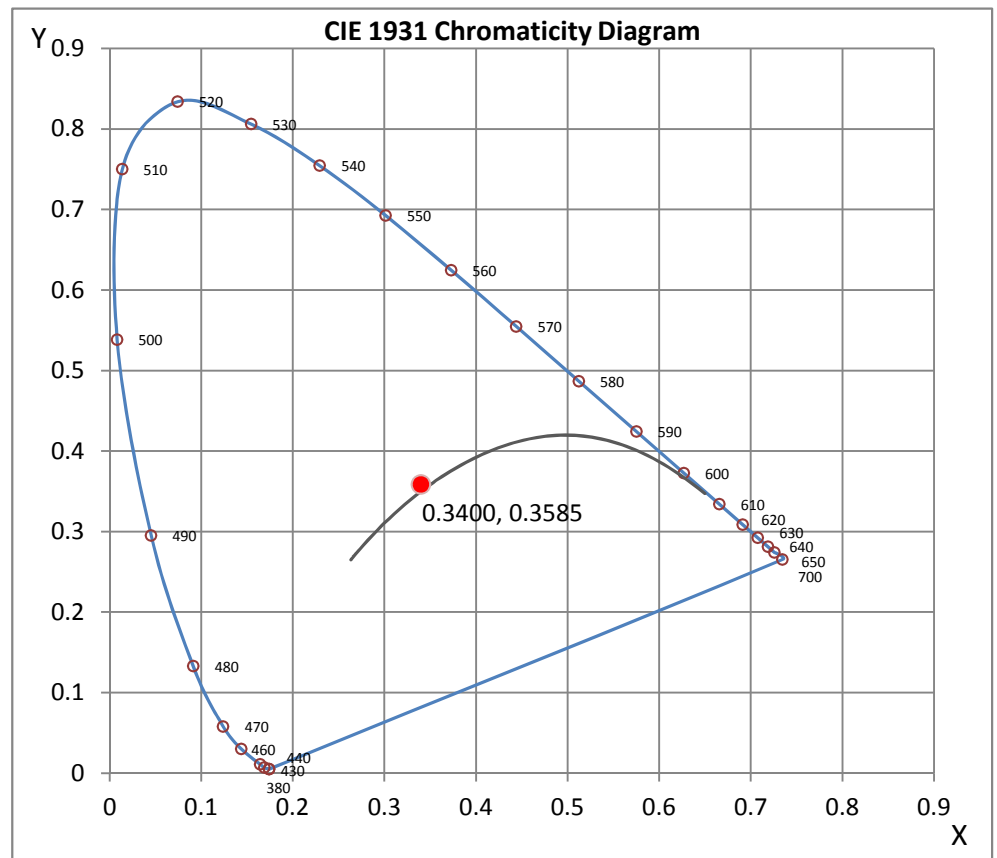
Wavelength	W/m ² nm	440	0.2483	510	0.1207	580	0.1901	650	0.0725	720	0.0121
380	0.0003	450	0.2756	520	0.1587	590	0.1792	660	0.0577	730	0.0093
390	0.0005	460	0.0985	530	0.1802	600	0.1640	670	0.0452	740	0.0071
400	0.0013	470	0.0453	540	0.1899	610	0.1463	680	0.0351	750	0.0054
410	0.0062	480	0.0301	550	0.1935	620	0.1274	690	0.0271	760	0.0042
420	0.0346	490	0.0391	560	0.1945	630	0.1082	700	0.0209	770	0.0032
430	0.1248	500	0.0747	570	0.1934	640	0.0896	710	0.0161	780	0.0028

CRI & CCT

x	0.3400
y	0.3585
u'	0.2054
v'	0.4872
CRI	70.30
CCT	5214
Duv	0.00551

R Values

R1	68.50
R2	73.64
R3	77.84
R4	72.31
R5	69.39
R6	64.85
R7	78.40
R8	57.78
R9	-29.95
R10	38.04
R11	71.01
R12	43.19
R13	68.31
R14	87.20



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Test Methods

Photometric Measurements - Goniophotometer

A Custom Light Laboratory Type C Rotating Mirror Goniophotometer was used to measure candelas(intensity) at each angle of distribution as defined by IESNA for the appropriate fixture type.

Ambient temperature is set to 25°C and is measured from the center of the fixture, within 1ft from the outside of the fixture. Temperature is maintained at 25°C throughout the testing process and the sample is stabilized for at least 30mins and longer as necessary for the sample to achieve stabilization.

Electrical measurements are measured using the listed equipment.

Spectral Measurements - Integrating Sphere

A Sensing Spectroradiometer SPR-3000, in conjunction with Light Laboratory 2 meter integrating sphere was used to measure chromaticity coordinates, correlated color temperature(CCT) and the color rendering index(CRI) for each sample.

Ambient temperature is set to 25°C and is measured from the center of the fixture, within 1ft from the outside of the fixture. Temperature is maintained at 25°C throughout the testing process and the sample is stabilized for at least 30mins and longer as necessary for the sample to achieve stabilization.

Electrical measurements are measured using the listed equipment.

Disclaimers:

This report must not be used by the customer to claim product certification, approval or endorsement by NVLAP, NIST or any agency of Federal Government.

Report Prepared by : THI NGUYEN

Test Report Released by:

Test Report Reviewed by:

Jeff Ahn
 Engineering Manager

Steve Kang
 Quality Assurance

**Attached are photometric data reports. Total number of pages: 10*

*All Results in accordance to IESNA LM-79-2008: Approved Method for the Electrical and Photometric Testing of Solid-State Lighting.



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Photometric Test Report

IES INDOOR REPORT

PHOTOMETRIC FILENAME : L12131202R01.IES

DESCRIPTION INFORMATION (From Photometric File)

IESNA:LM-63-2002
[TEST] L12131202R01
[TESTLAB] LIGHT LABORATORY, INC.
[ISSUEDATE] 2/24/2014
[MANUFAC] AQUALUMA
[LUMCAT] AQHBx12557CA-US
[LUMINAIRE] 16"DIA. X 8-1/2"H. LED FIXTURE
[MORE] CLEAR LENS
[BALLASTCAT] MEANWELL HLG-185H-48A
[BALLAST] INPUT: 100-240VAC, 2.1A, 50/60HZ OUTPUT: 48VDC, 3.9ADC
[LAMPPOSITION] 0,0
[LAMPCAT] N/A
[OTHER] INDICATING THE CANDELA VALUES ARE ABSOLUTE AND
[MORE] SHOULD NOT BE FACTORED FOR DIFFERENT LAMP RATINGS.
[_INPUT] 120VAC, 128.55W
[_TEST PROCEDURE] IESNA:LM-79-08

CHARACTERISTICS

Lumens Per Lamp	N.A. (absolute)
Total Lamp Lumens	N.A. (absolute)
Luminaire Lumens	17428
Total Luminaire Efficiency	N.A.
Luminaire Efficacy Rating (LER)	136
Total Luminaire Watts	128.55
Ballast Factor	1.00
CIE Type	Direct
Spacing Criterion (0-180)	1.52
Spacing Criterion (90-270)	1.52
Spacing Criterion (Diagonal)	1.62
Basic Luminous Shape	Circular
Luminous Length (0-180)	0.92 ft (Diameter)
Luminous Width (90-270)	0.92 ft (Diameter)
Luminous Height	0.00 ft

IES INDOOR REPORT
PHOTOMETRIC FILENAME : L12131202R01.IES

LUMINANCE DATA (cd/sq.m)

Angle In Degrees	Average 0-Deg	Average 45-Deg	Average 90-Deg
45	120977	120977	120977
55	117017	117017	117017
65	19713	19713	19713
75	13188	13188	13188
85	12250	12250	12250

IES INDOOR REPORT
PHOTOMETRIC FILENAME : L12131202R01.IES

CANDELA TABULATION

	<u>0</u>
0	5770
5	5797
10	5859
15	5918
20	6000
25	6009
30	5930
35	5779
40	5566
45	5288
50	4843
55	4149
60	2359
65	515
70	296
75	211
80	127
85	66
90	48
95	42
100	39
105	39
110	0
115	0
120	0
125	0
130	0
135	0
140	0
145	0
150	0
155	0
160	0
165	0
170	0
175	0
180	0

IES INDOOR REPORT
PHOTOMETRIC FILENAME : L12131202R01.IES

ZONAL LUMEN SUMMARY

Zone	Lumens	%Lamp	%Fixt
0-20	2236.07	N.A.	12.80
0-30	5006.48	N.A.	28.70
0-40	8623.54	N.A.	49.50
0-60	16139.83	N.A.	92.60
0-80	17266.81	N.A.	99.10
0-90	17350.47	N.A.	99.60
10-90	16795.22	N.A.	96.40
20-40	6387.47	N.A.	36.70
20-50	10444.3	N.A.	59.90
40-70	8420.31	N.A.	48.30
60-80	1126.99	N.A.	6.50
70-80	222.96	N.A.	1.30
80-90	83.66	N.A.	0.50
90-110	77.72	N.A.	0.40
90-120	77.72	N.A.	0.40
90-130	77.72	N.A.	0.40
90-150	77.72	N.A.	0.40
90-180	77.72	N.A.	0.40
110-180	0.00	N.A.	0.00
0-180	17428.19	N.A.	100.00

Total Luminaire Efficiency = N.A.%

ZONAL LUMEN SUMMARY

Zone	Lumens
0-10	555.25
10-20	1680.81
20-30	2770.41
30-40	3617.06
40-50	4056.82
50-60	3459.47
60-70	904.03
70-80	222.96
80-90	83.66
90-100	46.65
100-110	31.06
110-120	0.00
120-130	0.00
130-140	0.00
140-150	0.00
150-160	0.00
160-170	0.00
170-180	0.00

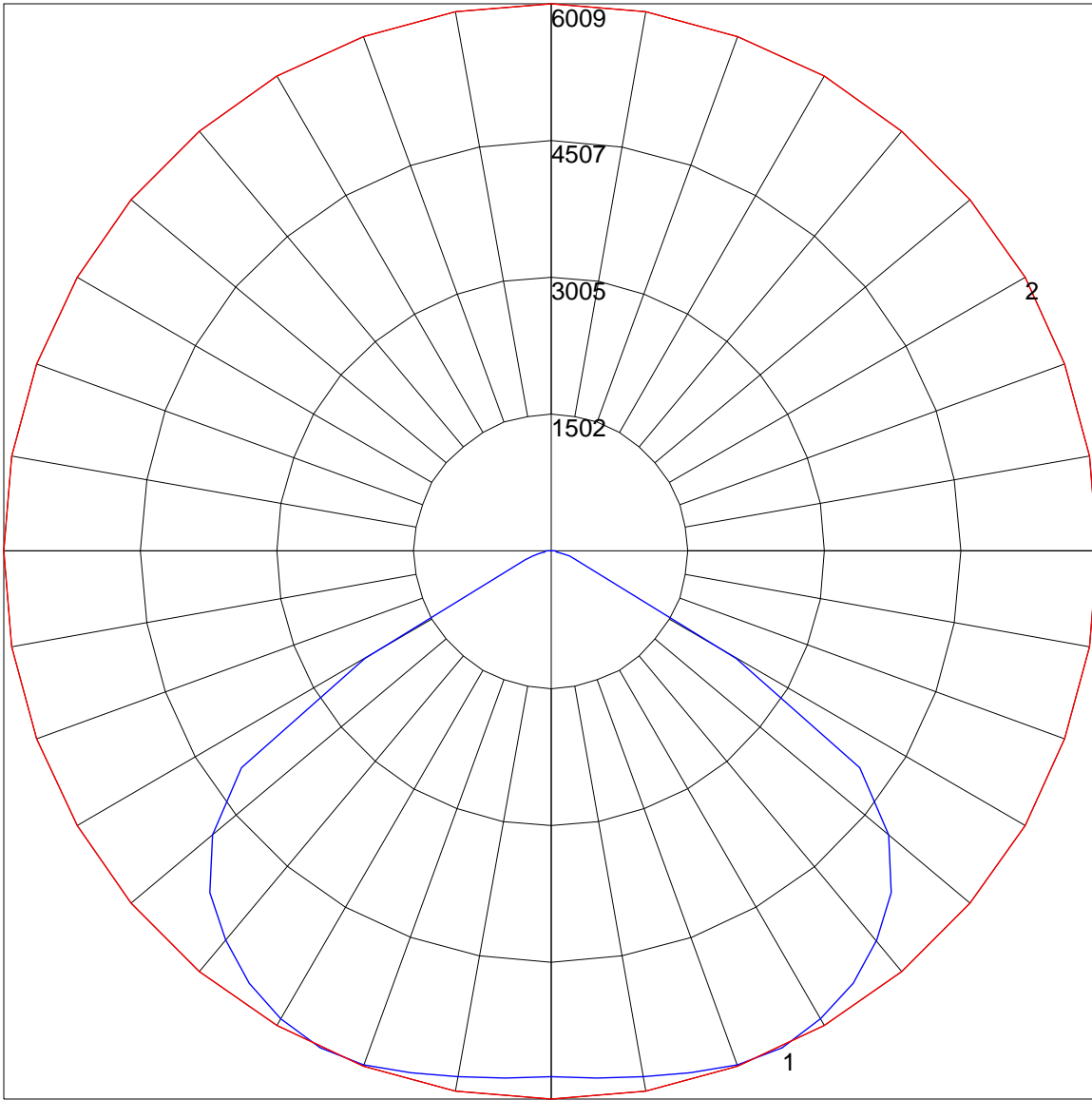
IES INDOOR REPORT
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COEFFICIENTS OF UTILIZATION - ZONAL CAVITY METHOD

Effective Floor Cavity Reflectance 0.20

RC	80				70				50			30			10			0
	RW	70	50	30	10	70	50	30	10	50	30	10	50	30	10	50	30	10
0	119	119	119	119	116	116	116	116	111	111	111	106	106	106	102	102	102	100
1	111	107	103	100	108	104	101	98	100	97	95	96	94	92	93	91	89	87
2	102	95	89	84	99	93	87	83	89	85	81	86	82	79	83	80	77	75
3	93	84	77	71	91	82	76	70	79	74	69	77	72	68	74	70	67	64
4	86	75	67	61	84	73	66	60	71	64	59	69	63	58	67	62	58	56
5	79	67	58	52	77	66	58	52	64	57	51	62	56	51	60	55	50	48
6	73	60	52	46	71	59	51	45	57	50	45	56	49	45	54	49	44	42
7	67	54	46	40	66	54	46	40	52	45	40	51	44	39	49	43	39	37
8	63	49	41	36	61	49	41	35	47	40	35	46	40	35	45	39	35	33
9	58	45	37	32	57	45	37	32	43	36	32	42	36	31	41	35	31	29
10	55	42	34	29	53	41	34	29	40	33	28	39	33	28	38	32	28	26

POLAR GRAPH



Maximum Candela = 6009 Located At Horizontal Angle = 0, Vertical Angle = 25
1 - Vertical Plane Through Horizontal Angles (0 - 180) (Through Max. Cd.)
2 - Horizontal Cone Through Vertical Angle (25) (Through Max. Cd.)