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Test #: L08133001

Date: 8/22/2013



NVLAP LAB CODE 200927-0

Test Report: L08133001

Model Number: LUX-LED-360°-4R-UNV-U

Report Prepared For: LUX DYNAMICS - Phase I
 1350 Capitol Blvd. Reno, NV. 89502

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 LUX-LED-360°-4R-UNV-U. Received in working and undamaged condition. No modifications were necessary.

Testing Condition: Fixture is tested with no special conditions.

Sample Arrival Date: 8/9/13

Date of Tests: 8/22/13 - 8/22/13

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	52kJ	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.

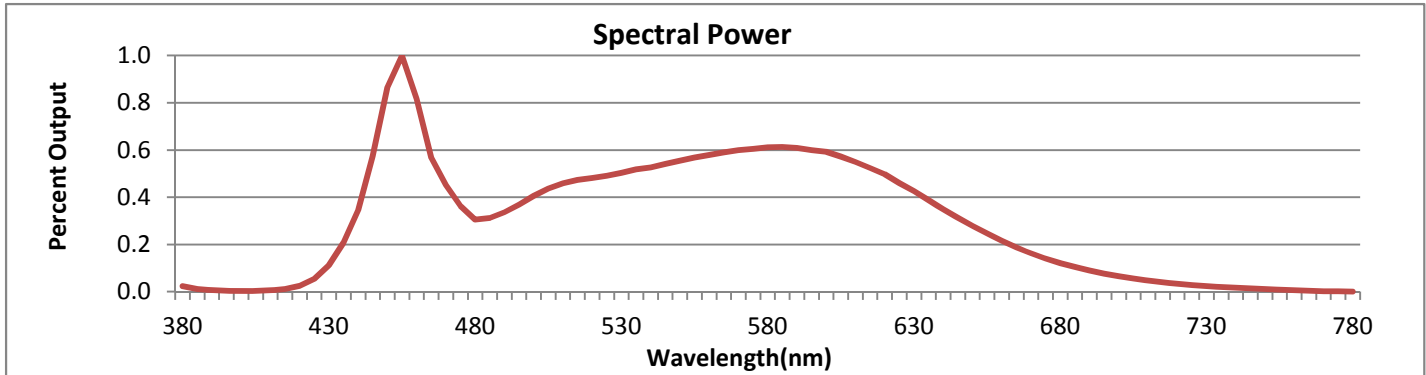
LM-79 Test Summary

Manufacturer:	LUX DYNAMICS - Phase I
Model Number:	LUX-LED-360°-4R-UNV-U
LAMPCAT:	N/A
Driver Model Number:	OSRAM OT100W/4x600C/UNV/DIM (1 DRIVERS)
Total Lumens:	4793.23
Input Voltage (VAC/60Hz):	120.00
Input Current (Amp):	0.41
Input Power (W):	48.85
Input Power Factor:	0.99
Total Harmonic Distortion @ 120V(%)	11%
Total Harmonic Distortion @ 277V(%)	N/A
Efficacy:	98
Color Rendering Index (CRI):	85
Correlated Color Temperature (K):	5138
Chromaticity Coordinate x:	0.3415
Chromaticity Coordinate y:	0.3513
Ambient Temperature (°F):	77.0
Stabilization Time (Hours):	0:30
Total Operating Time (Hours):	1:35
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.



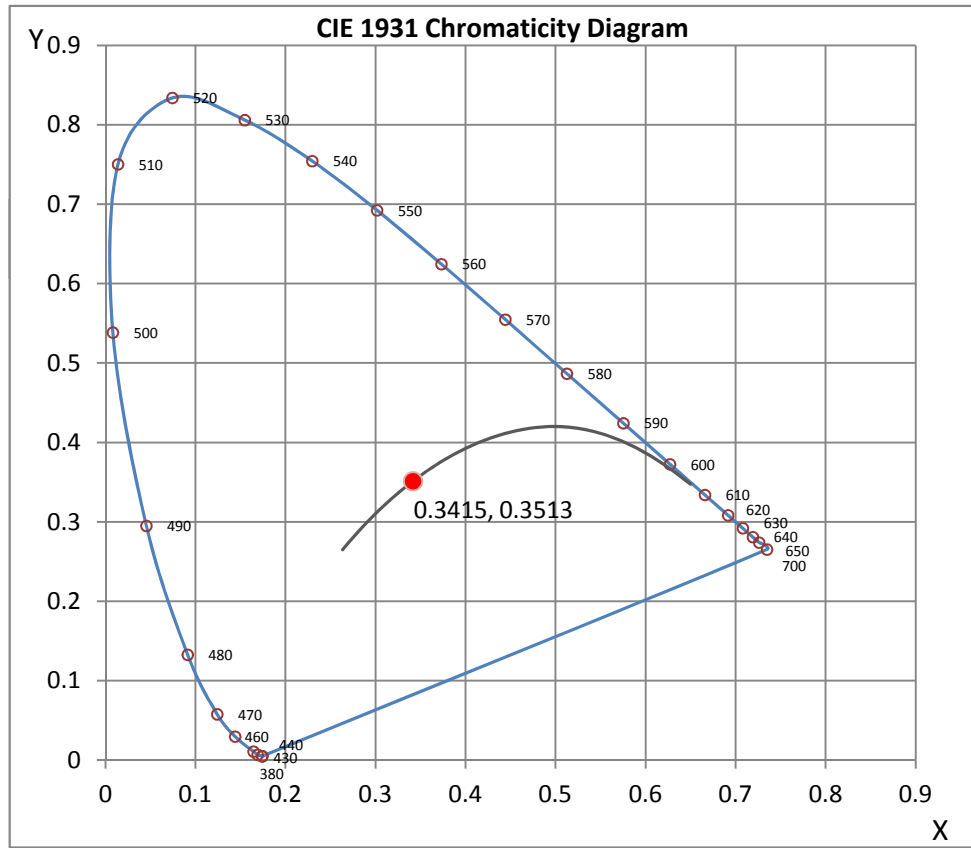
Wavelength	W/m ² nm	440	0.1920	510	0.2539	580	0.3388	650	0.1541	720	0.0185
380	0.0128	450	0.4796	520	0.2667	590	0.3378	660	0.1196	730	0.0130
390	0.0033	460	0.4525	530	0.2786	600	0.3282	670	0.0902	740	0.0089
400	0.0016	470	0.2500	540	0.2914	610	0.3044	680	0.0673	750	0.0059
410	0.0030	480	0.1694	550	0.3074	620	0.2759	690	0.0496	760	0.0034
420	0.0141	490	0.1865	560	0.3211	630	0.2358	700	0.0362	770	0.0012
430	0.0615	500	0.2248	570	0.3325	640	0.1933	710	0.0260	780	0.0001

CRI & CCT

x	0.3415
y	0.3513
u'	0.2091
v'	0.4840
CRI	84.90
CCT	5138
Duv	0.00133

R Values

R1	83.71
R2	92.22
R3	95.12
R4	82.86
R5	84.00
R6	87.54
R7	86.25
R8	67.66
R9	13.08
R10	80.77
R11	82.45
R12	65.14
R13	86.89
R14	97.70



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

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.

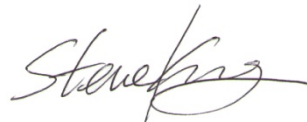
Report Prepared by : THI NGUYEN

Test Report Released by:



Jeff Ahn
Engineering Manager

Test Report Reviewed by:



Steve Kang
Quality Assurance

**Attached are photometric data reports. Total number of pages: 11*

**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 : L08133001.IES

DESCRIPTION INFORMATION (From Photometric File)

IESNA:LM-63-2002
 [TEST] L08133001
 [TESTLAB] LIGHT LABORATORY, INC.
 [ISSUEDATE] 8/22/2013
 [MANUFAC] LUX DYNAMICS
 [LUMCAT] LUX-LED-360°-4R-UNV-U
 [LUMINAIRE] 46-1/4"L. X 2-1/4"W. X 2-1/2"H. LED FIXTURE
 [MORE] PRISMATIC LENS
 [BALLASTCAT] OSRAM OT100W/4x600C/UNV/DIM (1 DRIVERS)
 [BALLAST] INPUT: 120-277VAC, 0.5-1.0A, 50/60HZ OUTPUT: 10-40VDC, 4X600mA
 [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, 48.85W
 [_TEST PROCEDURE] IESNA:LM-79-08

CHARACTERISTICS

Lumens Per Lamp	N.A. (absolute)
Total Lamp Lumens	N.A. (absolute)
Luminaire Lumens	4793
Total Luminaire Efficiency	N.A.
Luminaire Efficacy Rating (LER)	98
Total Luminaire Watts	48.85
Ballast Factor	1.00
CIE Type	Direct
Spacing Criterion (0-180)	1.26
Spacing Criterion (90-270)	1.38
Spacing Criterion (Diagonal)	1.46
Basic Luminous Shape	Rectangular w/Sides
Luminous Length (0-180)	3.83 ft
Luminous Width (90-270)	0.17 ft
Luminous Height	0.03 ft

IES INDOOR REPORT
PHOTOMETRIC FILENAME : L08133001.IES

LUMINANCE DATA (cd/sq.m)

Angle In Degrees	Average 0-Deg	Average 45-Deg	Average 90-Deg
45	22295	23330	21403
55	19165	19397	19204
65	14490	17166	17266
75	9610	15928	15852
85	5914	15985	15577

**IES INDOOR REPORT
PHOTOMETRIC FILENAME : L08133001.IES**

CANDELA TABULATION

	<u>0</u>	<u>5</u>	<u>15</u>	<u>25</u>	<u>35</u>	<u>45</u>	<u>55</u>	<u>65</u>	<u>75</u>	<u>85</u>
0	1520	1520	1520	1520	1520	1520	1520	1520	1520	1520
5	1509	1510	1522	1548	1573	1574	1560	1547	1540	1539
10	1486	1493	1538	1536	1519	1525	1545	1566	1573	1573
15	1457	1468	1503	1486	1517	1536	1538	1524	1536	1546
20	1413	1433	1442	1456	1485	1482	1512	1516	1531	1536
25	1358	1371	1388	1404	1417	1443	1480	1526	1515	1517
30	1293	1296	1317	1323	1348	1437	1451	1438	1422	1425
35	1197	1217	1210	1225	1327	1353	1339	1353	1350	1352
40	1080	1117	1095	1142	1217	1235	1248	1252	1243	1237
45	962	987	976	1055	1118	1129	1123	1092	1081	1080
50	830	831	850	906	953	968	936	936	948	961
55	673	675	726	761	799	799	804	829	829	838
60	534	526	561	615	661	675	703	706	697	708
65	377	377	422	488	539	562	583	598	602	608
70	241	253	289	373	425	460	488	496	512	521
75	155	158	190	270	334	371	384	398	412	413
80	85	86	114	194	252	279	301	319	335	345
85	34	36	62	128	178	210	241	260	253	249
90	14	16	32	73	113	148	161	156	151	151
95	0	15	17	42	61	87	97	97	104	110
100	0	14	14	15	29	45	58	67	74	77
105	0	14	14	14	15	26	35	42	48	52
110	0	13	13	13	13	14	17	23	27	30
115	0	13	13	13	13	13	13	13	14	16
120	0	13	13	13	13	13	13	13	13	13
125	0	12	12	12	13	13	13	13	13	13
130	0	12	12	12	12	13	13	13	13	13
135	0	0	0	0	0	0	0	0	0	0
140	0	0	0	0	0	0	0	0	0	0
145	0	0	0	0	0	0	0	0	0	0
150	0	0	0	0	0	0	0	0	0	0
155	0	0	0	0	0	0	0	0	0	0
160	0	0	0	0	0	0	0	0	0	0
165	0	0	0	0	0	0	0	0	0	0
170	0	0	0	0	0	0	0	0	0	0
175	0	0	0	0	0	0	0	0	0	0
180	0	0	0	0	0	0	0	0	0	0

Vert. Horizontal Angles

	<u>90</u>
0	1520
5	1539
10	1575
15	1548
20	1536
25	1518
30	1424
35	1356
40	1239
45	1078
50	961
55	835
60	710

CANDELA TABULATION - (Cont.)

65	609
70	522
75	412
80	347
85	248
90	151
95	111
100	77
105	52
110	30
115	16
120	13
125	13
130	13
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 : L08133001.IES

ZONAL LUMEN SUMMARY

Zone	Lumens	%Lamp	%Fixt
0-20	576.05	N.A.	12.00
0-30	1243.00	N.A.	25.90
0-40	2055.69	N.A.	42.90
0-60	3580.45	N.A.	74.70
0-80	4458.53	N.A.	93.00
0-90	4654.12	N.A.	97.10
10-90	4507.05	N.A.	94.00
20-40	1479.64	N.A.	30.90
20-50	2301.97	N.A.	48.00
40-70	2053.77	N.A.	42.80
60-80	878.08	N.A.	18.30
70-80	349.08	N.A.	7.30
80-90	195.59	N.A.	4.10
90-110	111.47	N.A.	2.30
90-120	125.53	N.A.	2.60
90-130	136.64	N.A.	2.90
90-150	139.11	N.A.	2.90
90-180	139.11	N.A.	2.90
110-180	27.64	N.A.	0.60
0-180	4793.23	N.A.	100.00

Total Luminaire Efficiency = N.A.%

ZONAL LUMEN SUMMARY

Zone	Lumens
0-10	147.07
10-20	428.98
20-30	666.95
30-40	812.69
40-50	822.33
50-60	702.44
60-70	529.00
70-80	349.08
80-90	195.59
90-100	80.17
100-110	31.29
110-120	14.06
120-130	11.11
130-140	2.47
140-150	0.00
150-160	0.00
160-170	0.00
170-180	0.00

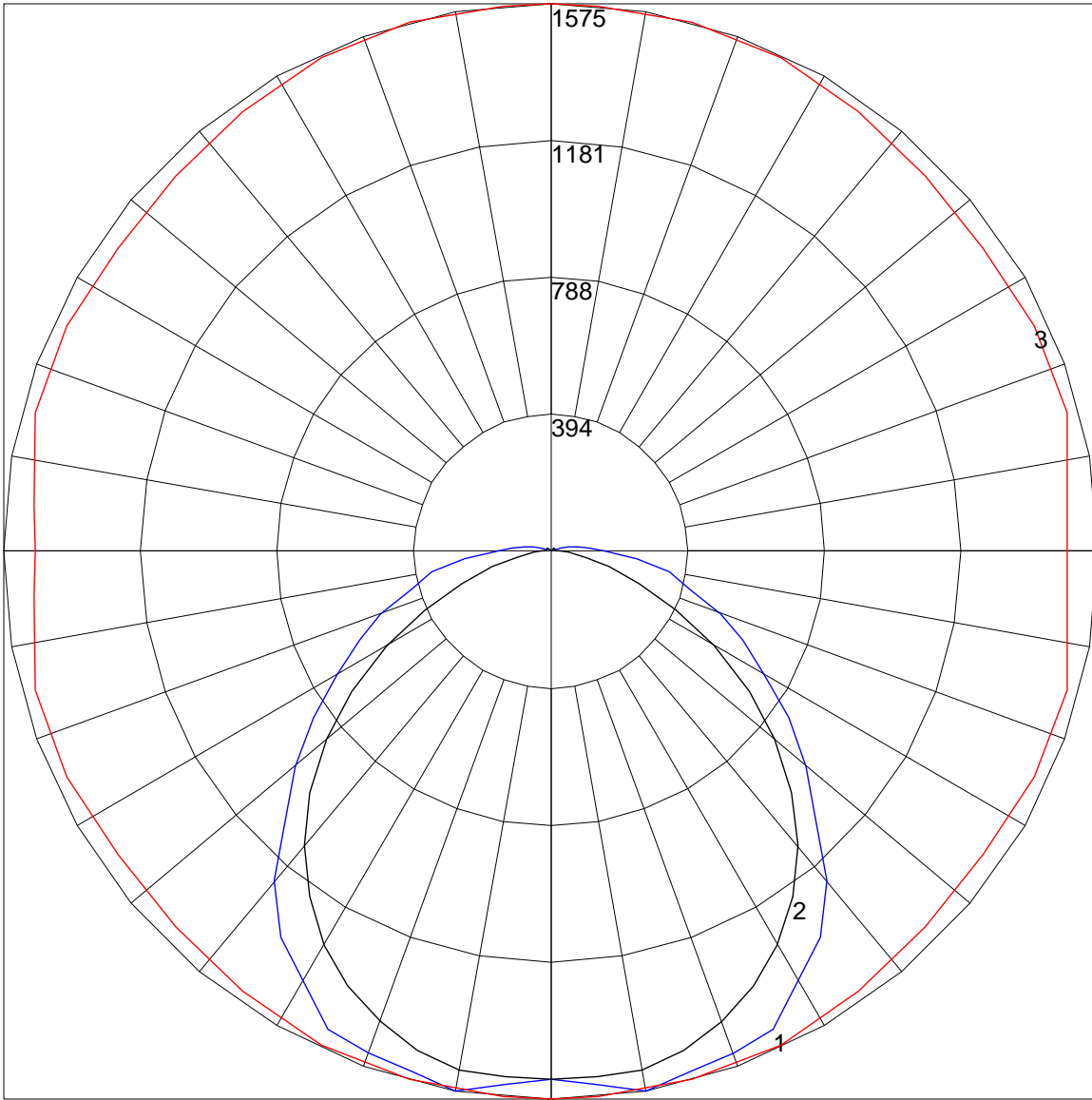
IES INDOOR REPORT
PHOTOMETRIC FILENAME : L08133001.IES

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
0	118	118	118	118	118	115	115	115	115	110	110	110	104	104	104	99	99	99	97
1	107	102	97	93	93	104	99	95	92	95	91	88	90	87	85	86	84	82	79
2	97	89	82	76	76	94	87	80	75	83	77	72	79	74	70	75	72	68	66
3	89	78	70	63	63	86	76	68	62	73	66	61	70	64	59	67	62	58	55
4	81	69	60	53	53	79	67	59	53	65	57	52	62	56	51	59	54	50	47
5	75	62	53	46	46	72	60	52	45	58	50	45	56	49	44	53	48	43	41
6	69	56	46	40	40	67	54	46	40	52	45	39	50	44	39	48	43	38	36
7	64	50	41	35	35	62	49	41	35	48	40	35	46	39	34	44	38	34	32
8	60	46	37	31	31	58	45	37	31	44	36	31	42	35	31	41	35	30	28
9	56	42	34	28	28	54	41	34	28	40	33	28	39	32	28	38	32	27	25
10	52	39	31	26	26	51	38	31	25	37	30	25	36	29	25	35	29	25	23

POLAR GRAPH



Maximum Candela = 1575 Located At Horizontal Angle = 90, Vertical Angle = 10
1 - Vertical Plane Through Horizontal Angles (90 - 270) (Through Max. Cd.)
2 - Vertical Plane Through Horizontal Angles (10 - 190)
3 - Horizontal Cone Through Vertical Angle (10) (Through Max. Cd.)