



8165 E Kaiser Blvd. Anaheim, CA 92808
 p. 714.282.2270
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Test #: L04130402

Date: 5/2/2013



NVLAP LAB CODE 200927-0

Test Report: L04130402

Model Number: TVL4000 CW

Report Prepared For: ELATION LIGHTING
 6122 S. EASTERN AVE; COMMERCE, CA 90040

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

Description of Sample: Client submitted the sample. Fixture catalog number is TVL4000 CW. Received in working and undamaged condition. No modifications were necessary.

Sample Arrival Date: 3/28/13

Date of Tests: 4/1/13 - 5/2/13

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:	ELATION LIGHTING
Model Number:	TVL4000 CW
LAMPCAT:	N/A
Driver Model Number:	N/A
Total Lumens:	4910.30
Input Voltage (VAC/60Hz):	110.00
Input Current (Amp):	1.49
Input Power (W):	87.40
Input Power Factor:	0.5315
Total Harmonic Distortion @ 120V(%):	156.2%
Total Harmonic Distortion @ 277V(%):	N/A
Efficacy:	56.18
Color Rendering Index (CRI):	86.01
Correlated Color Temperature (K):	6676
Chromaticity Coordinate x:	0.3095
Chromaticity Coordinate y:	0.3292
Ambient Temperature (°F):	77.0
Stabilization Time (Hours):	0:15
Total Operating Time (Hours):	1:00
Off State Power(W):	0.00

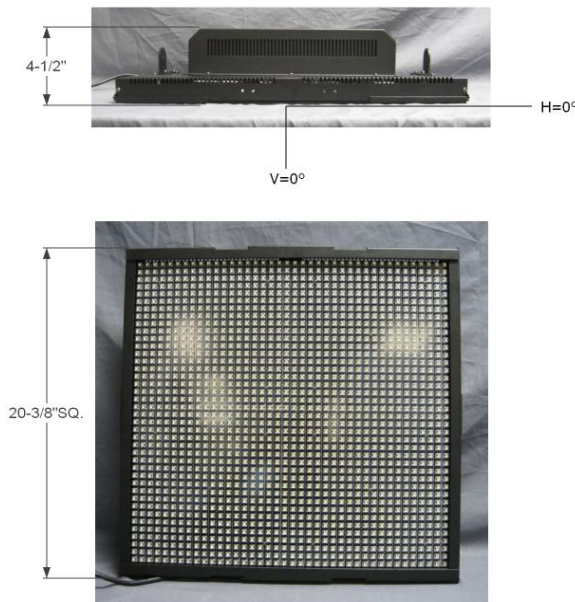
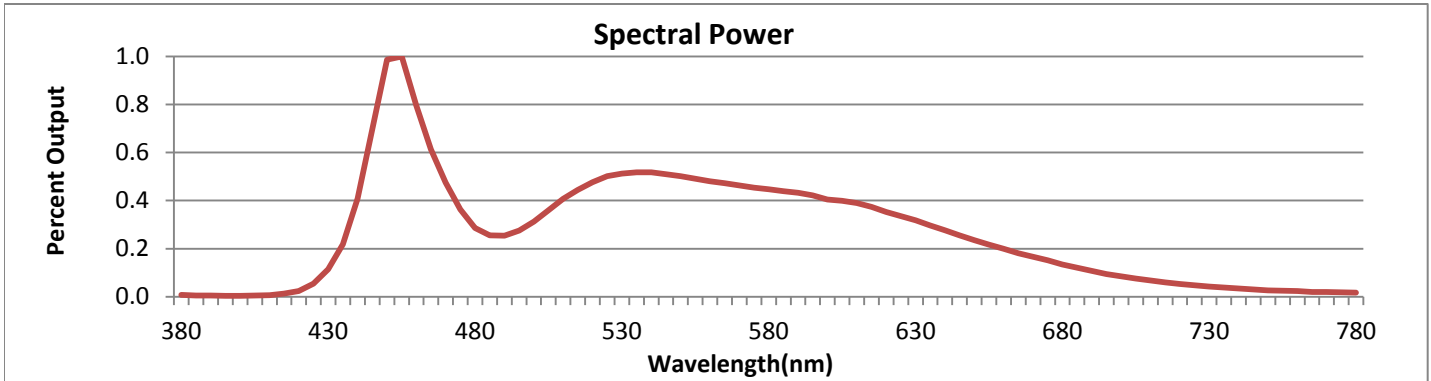


FIG.1 LUMINAIRE

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



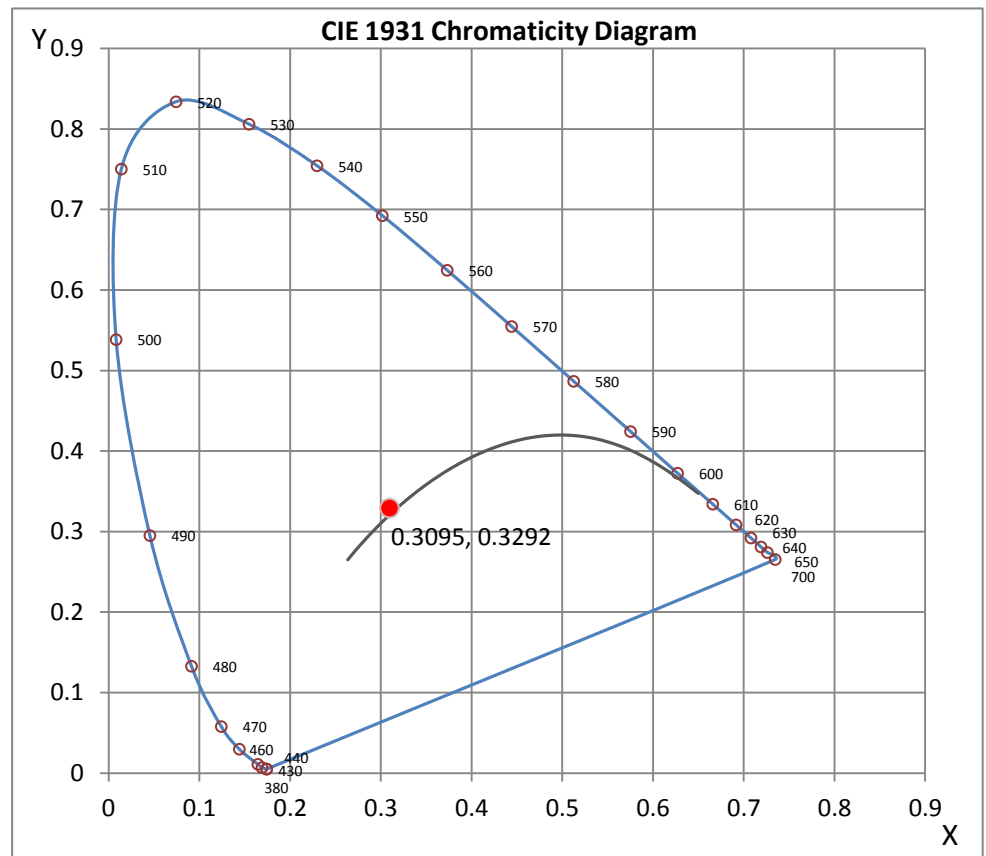
Wavelength	W/m ² nm	440	2.1869	510	2.1847	580	2.3972	650	1.2643	720	0.2820
380	0.0390	450	5.2907	520	2.5572	590	2.3180	660	1.0720	730	0.2236
390	0.0248	460	4.2789	530	2.7503	600	2.1702	670	0.8891	740	0.1807
400	0.0209	470	2.5504	540	2.7737	610	2.0920	680	0.7187	750	0.1389
410	0.0347	480	1.5323	550	2.6888	620	1.8927	690	0.5734	760	0.1233
420	0.1295	490	1.3595	560	2.5763	630	1.7034	700	0.4538	770	0.1056
430	0.6132	500	1.6772	570	2.4838	640	1.4859	710	0.3636	780	0.0871

CRI & CCT

x	0.3095
y	0.3292
u'	0.1955
v'	0.4680
CRI	86.01
CCT	6676
Duv	0.00493

R Values

R1	85.28
R2	89.51
R3	89.82
R4	85.16
R5	84.08
R6	83.38
R7	92.11
R8	78.71
R9	33.74
R10	72.46
R11	83.39
R12	55.05
R13	86.83
R14	94.41



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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.

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: 9*



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Photometric Test Report

IES INDOOR REPORT
PHOTOMETRIC FILENAME : L04130402.IES

DESCRIPTION INFORMATION (From Photometric File)

IESNA:LM-63-2002
 [TEST] L04130402
 [TESTLAB] LIGHT LABORATORY, INC.
 [ISSUEDATE] 05/02/2013
 [MANUFAC] ELATION LIGHTING
 [LUMCAT] TVL4000CW
 [LUMINAIRE] 4-1/2"H. X 20-3/8"SQ. LED FIXTURE
 [MORE] NO LENS COOL WHITE
 [OTHER] INDICATING THE CANDELA VALUES ARE ABSOLUTE AND
 [MORE] SHOULD NOT BE FACTORED FOR DIFFERENT LAMP RATINGS.
 [_INPUT] 110VAC, 87.40W
 [_TEST PROCEDURE] IESNA:LM-79-08

CHARACTERISTICS

Lumens Per Lamp	N.A. (absolute)
Total Lamp Lumens	N.A. (absolute)
Luminaire Lumens	4910
Total Luminaire Efficiency	N.A.
Luminaire Efficacy Rating (LER)	56
Total Luminaire Watts	87.4
Ballast Factor	1.00
CIE Type	Direct
Spacing Criterion (0-180)	0.36
Spacing Criterion (90-270)	0.40
Spacing Criterion (Diagonal)	0.42
Basic Luminous Shape	Rectangular
Luminous Length (0-180)	1.56 ft
Luminous Width (90-270)	1.56 ft
Luminous Height	0.00 ft

LUMINANCE DATA (cd/sq.m)

Angle In Degrees	Average 0-Deg	Average 45-Deg	Average 90-Deg
45	2825	2900	3050
55	1888	1903	1988
65	1485	1495	1516
75	1485	1776	1451
85	2332	2941	2332

IES INDOOR REPORT
PHOTOMETRIC FILENAME : L04130402.IES

CANDELA TABULATION

	<u>0.0</u>	<u>22.5</u>	<u>45.0</u>	<u>67.5</u>	<u>90.0</u>
0	14932	14932	14932	14932	14932
5	12339	12383	12489	12573	12605
10	7814	7917	8130	8316	8392
15	4578	4653	4805	4955	5003
20	2794	2850	2937	2999	3015
25	1830	1872	1966	1981	1971
30	1276	1307	1385	1392	1368
35	913	934	979	994	984
40	639	649	672	699	698
45	452	455	464	489	488
50	329	330	334	352	351
55	245	246	247	258	258
60	186	187	191	195	197
65	142	140	143	146	145
70	89	104	105	106	95
75	87	110	104	105	85
80	76	91	78	88	73
85	46	66	58	63	46
90	0	0	0	0	0

IES INDOOR REPORT
PHOTOMETRIC FILENAME : L04130402.IES

ZONAL LUMEN SUMMARY

Zone	Lumens	%Lamp	%Fixt
0-20	2467.24	N.A.	50.20
0-30	3391.44	N.A.	69.10
0-40	4005.35	N.A.	81.60
0-60	4610.41	N.A.	93.90
0-80	4856.00	N.A.	98.90
0-90	4910.3	N.A.	100.00
10-90	3845.83	N.A.	78.30
20-40	1538.11	N.A.	31.30
20-50	1912.86	N.A.	39.00
40-70	748.32	N.A.	15.20
60-80	245.59	N.A.	5.00
70-80	102.33	N.A.	2.10
80-90	54.30	N.A.	1.10
90-110	0.00	N.A.	0.00
90-120	0.00	N.A.	0.00
90-130	0.00	N.A.	0.00
90-150	0.00	N.A.	0.00
90-180	0.00	N.A.	0.00
110-180	0.00	N.A.	0.00
0-180	4910.3	N.A.	100.00

Total Luminaire Efficiency = N.A.%

ZONAL LUMEN SUMMARY

Zone	Lumens
0-10	1064.47
10-20	1402.77
20-30	924.20
30-40	613.91
40-50	374.75
50-60	230.31
60-70	143.26
70-80	102.33
80-90	54.30
90-100	0.00
100-110	0.00
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

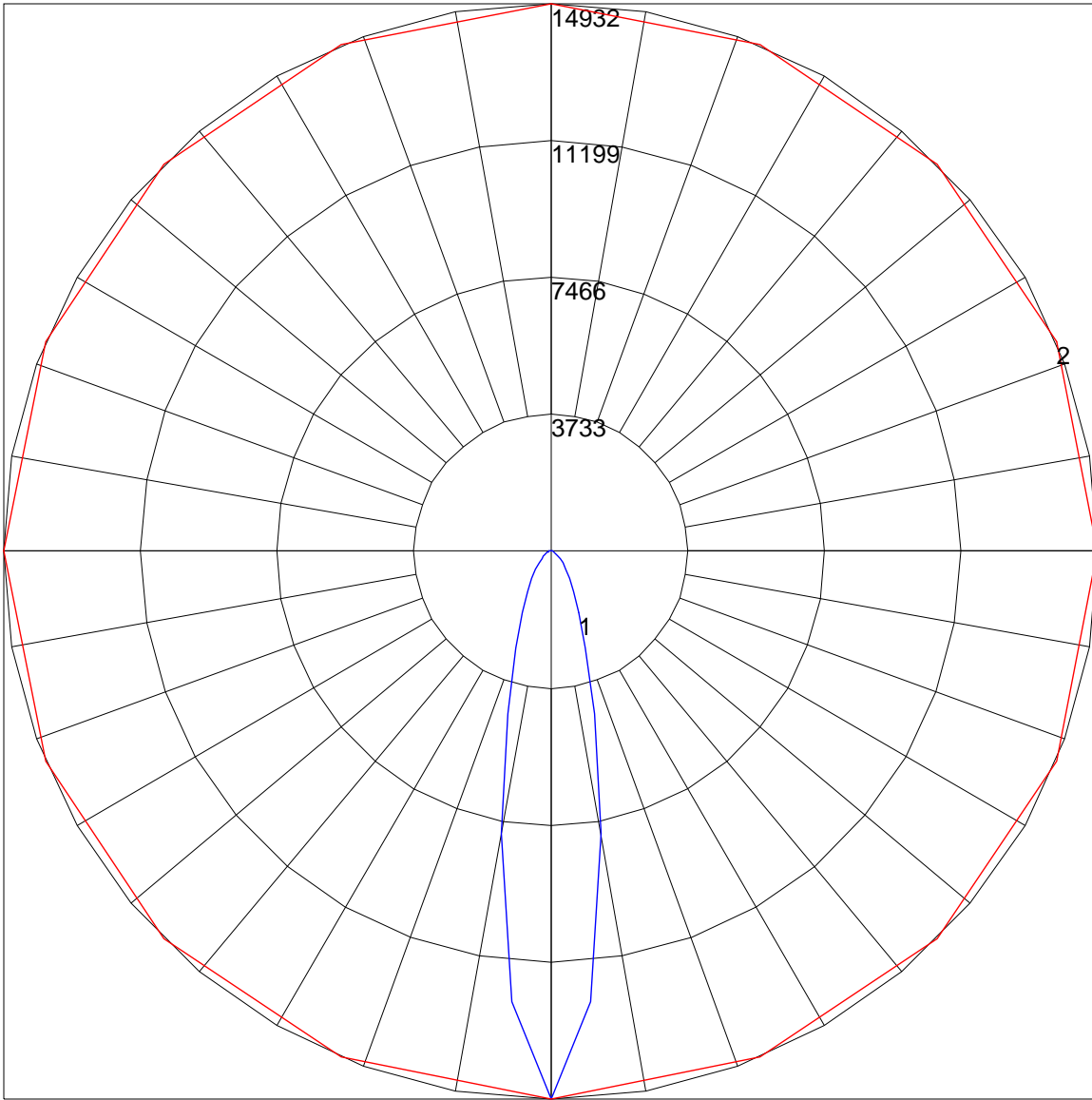
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COEFFICIENTS OF UTILIZATION - ZONAL CAVITY METHOD

Effective Floor Cavity Reflectance 0.20

RC RW	80				70				50			30			10			0
	70	50	30	10	70	50	30	10	50	30	10	50	30	10	50	30	10	0
0	119	119	119	119	116	116	116	116	111	111	111	106	106	106	102	102	102	100
1	113	110	107	104	110	107	105	103	103	101	99	100	98	97	96	95	94	92
2	107	102	97	93	105	100	96	92	97	93	90	93	91	88	91	89	87	85
3	101	95	89	85	99	93	88	84	91	86	83	88	85	82	86	83	81	79
4	96	89	83	79	95	87	82	78	85	81	77	83	79	76	81	78	75	74
5	92	83	78	73	90	82	77	73	81	76	72	79	75	72	77	74	71	69
6	88	79	73	69	86	78	72	68	77	72	68	75	71	67	74	70	67	66
7	84	75	69	65	83	74	69	65	73	68	64	72	67	64	71	67	64	62
8	80	71	65	61	79	71	65	61	70	65	61	69	64	61	68	64	61	59
9	77	68	62	59	76	68	62	58	67	62	58	66	61	58	65	61	58	57
10	74	65	60	56	73	65	59	56	64	59	56	63	59	56	62	58	55	54

POLAR GRAPH



Maximum Candela = 14932 Located At Horizontal Angle = 0, Vertical Angle = 0
1 - Vertical Plane Through Horizontal Angles (0 - 180) (Through Max. Cd.)
2 - Horizontal Cone Through Vertical Angle (0) (Through Max. Cd.)