



8165 E Kaiser Blvd. Anaheim, CA 92808  
 p. 714.282.2270  
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Test #: L04130403

Date: 5/2/2013



NVLAP LAB CODE 200927-0

**Test Report:** L04130403

**Model Number:** TVL4000 WW/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 WW/CW. Received in working and undamaged condition. No modifications were necessary.

**Sample Arrival Date:** 3/28/13

**Date of Tests:** 4/30/13 - 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**

<b>Manufacturer:</b>	ELATION LIGHTING
<b>Model Number:</b>	TVL4000 WW/CW
<b>LAMPCAT:</b>	N/A
<b>Driver Model Number:</b>	N/A
<b>Total Lumens:</b>	8582.22
<b>Input Voltage (VAC/60Hz):</b>	110.00
<b>Input Current (Amp):</b>	2.51
<b>Input Power (W):</b>	156.10
<b>Input Power Factor:</b>	0.5649
<b>Total Harmonic Distortion @ 120V(%):</b>	142.3%
<b>Total Harmonic Distortion @ 277V(%):</b>	N/A
<b>Efficacy:</b>	54.98
<b>Color Rendering Index (CRI):</b>	89.41
<b>Correlated Color Temperature (K):</b>	4775
<b>Chromaticity Coordinate x:</b>	0.3517
<b>Chromaticity Coordinate y:</b>	0.3569
<b>Ambient Temperature (°F):</b>	77.0
<b>Stabilization Time (Hours):</b>	0:40
<b>Total Operating Time (Hours):</b>	1:10
<b>Off State Power(W):</b>	0.00

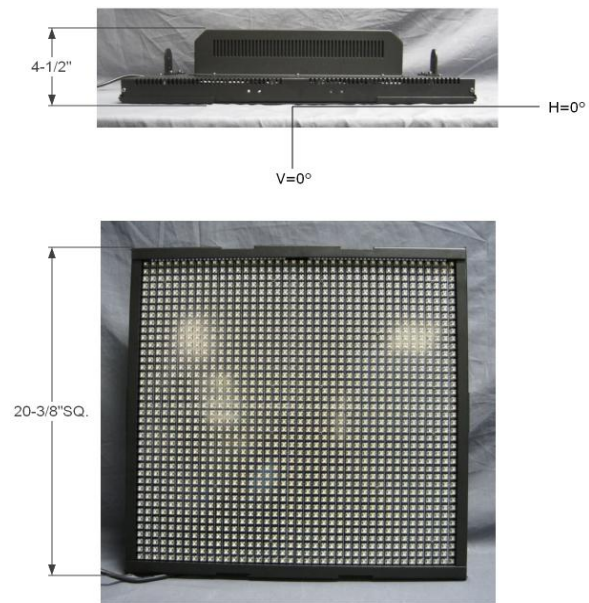
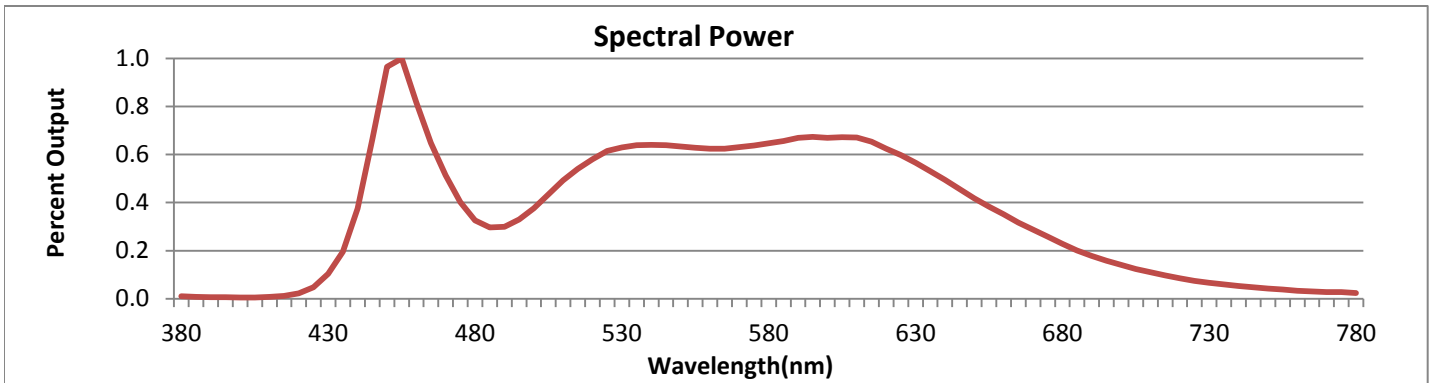


FIG.1 LUMINAIRE

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



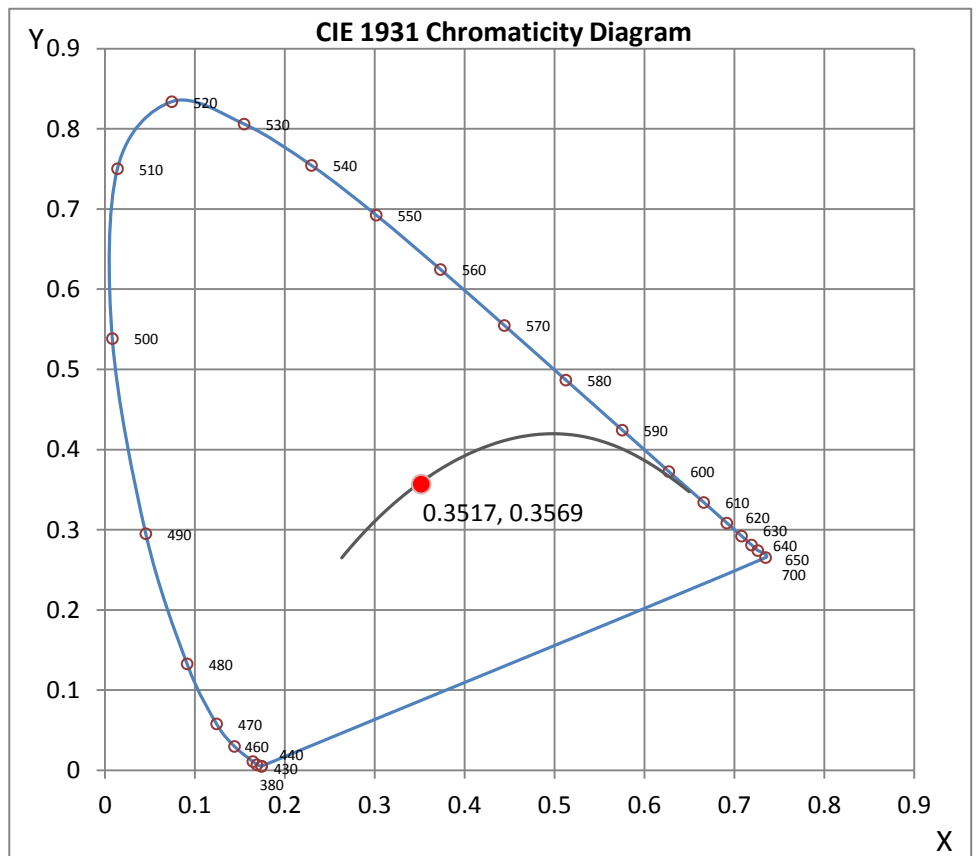
Wavelength	W/m <sup>2</sup> nm	440	2.4462	510	3.2099	580	4.2122	650	2.7220	720	0.5546
380	0.0661	450	6.2855	520	3.7799	590	4.3562	660	2.2863	730	0.4277
390	0.0401	460	5.3325	530	4.1017	600	4.3557	670	1.8695	740	0.3472
400	0.0318	470	3.3476	540	4.1726	610	4.3664	680	1.4881	750	0.2732
410	0.0465	480	2.1203	550	4.1235	620	4.0660	690	1.1580	760	0.2165
420	0.1467	490	1.9500	560	4.0675	630	3.6792	700	0.9169	770	0.1832
430	0.6699	500	2.4555	570	4.1067	640	3.2231	710	0.7201	780	0.1570

**CRI & CCT**

x	0.3517
y	0.3569
u'	0.2138
v'	0.4882
CRI	89.41
CCT	4775
Duv	0.00004

**R Values**

R1	90.07
R2	93.61
R3	93.69
R4	88.86
R5	88.13
R6	88.61
R7	92.14
R8	80.17
R9	46.26
R10	81.85
R11	88.07
R12	60.39
R13	91.62
R14	96.21



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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 : L04130403.IES**

## DESCRIPTION INFORMATION (From Photometric File)

IESNA:LM-63-2002  
 [TEST] L04130403  
 [TESTLAB] LIGHT LABORATORY, INC.  
 [ISSUEDATE] 05/02/2013  
 [MANUFAC] ELATION LIGHTING  
 [LUMCAT] TVL4000 WW/CW  
 [LUMINAIRE] 4-1/2"H. X 20-3/8"SQ. LED FIXTURE  
 [MORE] NO LENS 4800K  
 [OTHER] INDICATING THE CANDELA VALUES ARE ABSOLUTE AND  
 [MORE] SHOULD NOT BE FACTORED FOR DIFFERENT LAMP RATINGS.  
 [INPUT] 110VAC, 156.10W  
 [TEST PROCEDURE] IESNA:LM-79-08

## CHARACTERISTICS

Lumens Per Lamp	N.A. (absolute)
Total Lamp Lumens	N.A. (absolute)
Luminaire Lumens	8582
Total Luminaire Efficiency	N.A.
Luminaire Efficacy Rating (LER)	55
Total Luminaire Watts	156.1
Ballast Factor	1.00
CIE Type	Direct
Spacing Criterion (0-180)	0.36
Spacing Criterion (90-270)	0.40
Spacing Criterion (Diagonal)	0.44
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	5274	5374	5612
55	3667	3644	3744
65	2896	2865	2865
75	2595	3193	2629
85	4005	5121	4157

IES INDOOR REPORT  
PHOTOMETRIC FILENAME : L04130403.IES

CANDELA TABULATION

	<u>0.0</u>	<u>22.5</u>	<u>45.0</u>	<u>67.5</u>	<u>90.0</u>
<b>0</b>	25269	25269	25269	25269	25269
<b>5</b>	20937	21007	21158	21264	21304
<b>10</b>	13422	13559	13850	14095	14209
<b>15</b>	7933	8042	8242	8426	8488
<b>20</b>	4833	4932	5047	5127	5145
<b>25</b>	3208	3260	3395	3419	3406
<b>30</b>	2271	2312	2409	2437	2403
<b>35</b>	1651	1677	1739	1775	1755
<b>40</b>	1177	1184	1224	1270	1266
<b>45</b>	844	841	860	899	898
<b>50</b>	624	619	627	649	647
<b>55</b>	476	470	473	483	486
<b>60</b>	366	363	367	375	378
<b>65</b>	277	269	274	278	274
<b>70</b>	161	192	193	194	173
<b>75</b>	152	195	187	190	154
<b>80</b>	132	159	136	155	129
<b>85</b>	79	114	101	112	82
<b>90</b>	0	0	0	0	0

**IES INDOOR REPORT**  
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**ZONAL LUMEN SUMMARY**

Zone	Lumens	%Lamp	%Fixt
0-20	4206.55	N.A.	49.00
0-30	5808.05	N.A.	67.70
0-40	6903.31	N.A.	80.40
0-60	8030.72	N.A.	93.60
0-80	8487.21	N.A.	98.90
0-90	8582.22	N.A.	100.00
10-90	6776.56	N.A.	79.00
20-40	2696.76	N.A.	31.40
20-50	3387.4	N.A.	39.50
40-70	1400.44	N.A.	16.30
60-80	456.49	N.A.	5.30
70-80	183.45	N.A.	2.10
80-90	95.01	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	8582.22	N.A.	100.00

Total Luminaire Efficiency = N.A.%

**ZONAL LUMEN SUMMARY**

Zone	Lumens
0-10	1805.66
10-20	2400.89
20-30	1601.5
30-40	1095.26
40-50	690.64
50-60	436.77
60-70	273.04
70-80	183.45
80-90	95.01
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

**IES INDOOR REPORT**  
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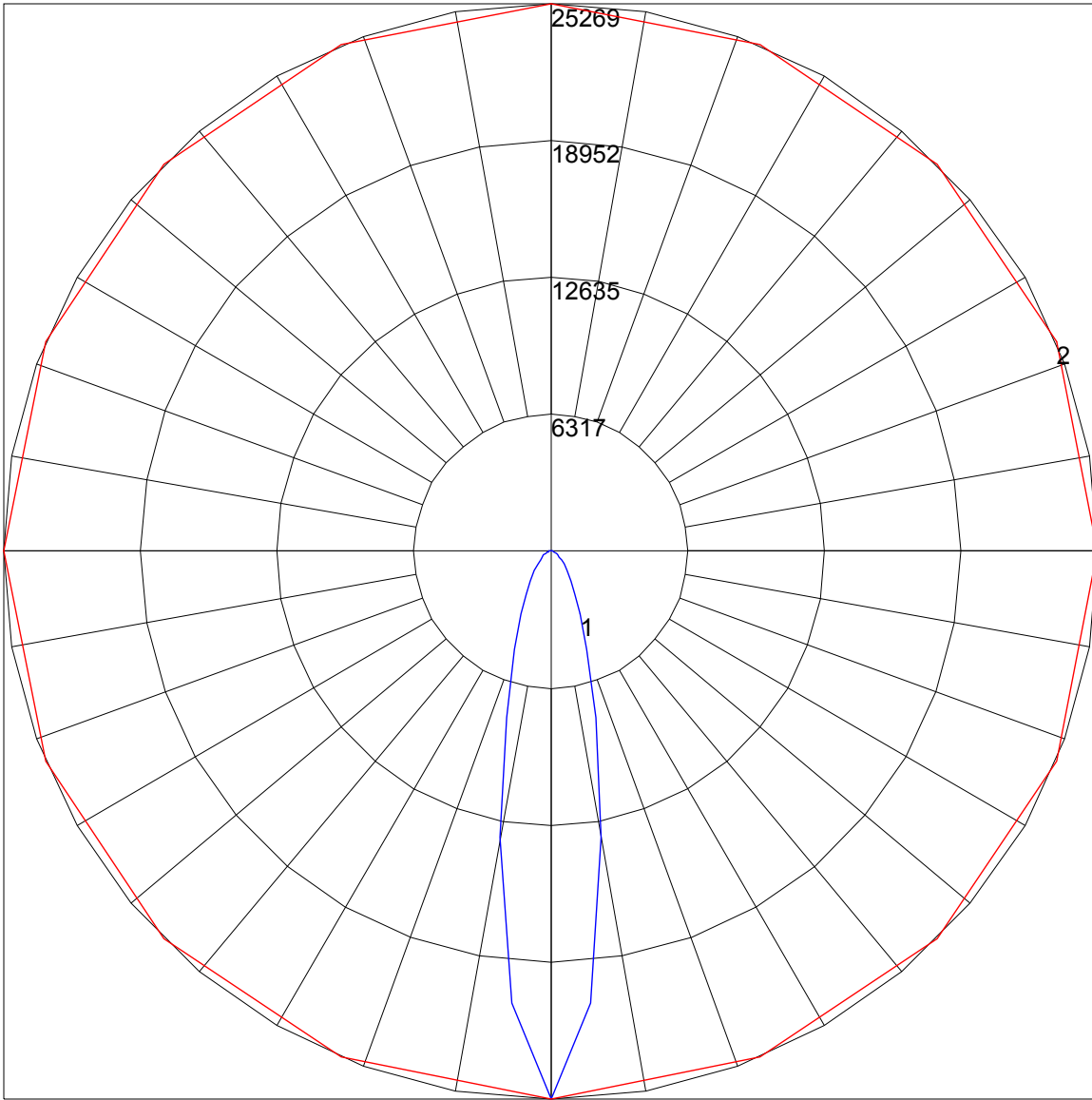
**COEFFICIENTS OF UTILIZATION - ZONAL CAVITY METHOD**

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
0	119	119	119	119	116	116	116	116	111	111	111	106	106	106	102	102	102	100
1	113	109	107	104	110	107	105	102	103	101	99	99	98	96	96	95	93	92
2	107	101	97	93	104	99	95	92	96	93	90	93	90	88	90	88	86	84
3	101	94	89	85	99	93	88	84	90	86	83	88	84	81	85	82	80	78
4	96	88	82	78	94	87	82	77	85	80	76	83	79	76	81	77	75	73
5	91	83	77	72	90	82	76	72	80	75	71	78	74	71	77	73	70	69
6	87	78	72	68	86	77	72	68	76	71	67	74	70	67	73	69	66	65
7	83	74	68	64	82	73	68	64	72	67	63	71	66	63	70	66	63	61
8	80	70	65	61	79	70	64	60	69	64	60	68	63	60	67	63	60	58
9	77	67	61	58	76	67	61	57	66	61	57	65	60	57	64	60	57	56
10	74	64	59	55	73	64	59	55	63	58	55	62	58	55	62	57	54	53



POLAR GRAPH



Maximum Candela = 25269 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.)