



FOR THE SCOPE OF
ACCREDITATION UNDER A2LA
TO ISO/IEC 17025:2005.

REPORT

25800 COMMERCENTRE DRIVE, LAKE FOREST, CA 92630

Project No. G101589308

Date: April 2, 2014

REPORT NO. 101589308LAX-016

TEST OF ONE TVL 2000 II FULL ON

RENDERED TO

ELATION PROFESSIONAL
6122 S. EASTERN AVE.
COMMERCE, CA 90040

TEST: Electrical and Photometric tests as required to the IESNA test standard.

STATEMENT OF LIMITATION: This report must not be used by the client to claim product certification, approval, or endorsement by A2LA, NIST, or any agency of the federal government.

AUTHORIZATION: The testing performed was authorized by signed quote number 500515440.

STANDARDS USED: The following American National Standards or Illuminating Engineering Society of North America Test Guides were used in part or totally to test each specimen:

IESNA LM-79 - 2008: Electrical and Photometric Measurements of Solid State Lighting

DESCRIPTION OF SAMPLE: The client submitted one production sample of TVL 2000 II FULL ON. The sample was received by Intertek on January 0, 1900, in undamaged condition and one sample was tested as received. The sample designation was LAN1403210902-016.

DATES OF TESTS: March 25, 2014

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SUMMARY

Description:	TVL 2000 II FULL ON
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Criteria	Result	
	Sphere	Goniometer
Total Lumen Output (Lumens)	3851	3762
Total Power (W)	85.66	85.44
Luminaire Efficacy (LPW)	44.96	44.03

Criteria	Result
Power Factor	0.995
Current ATHD %	6.72
Correlated Color Temperature (CCT - K)	4727
Color Rendering Index (CRI - Ra)	95.5
Color Rendering Index (CRI - R9)	73.0
DUV	0.006
Chromaticity Coordinate (x)	0.352
Chromaticity Coordinate (y)	0.346
Chromaticity Coordinate (u')	0.218
Chromaticity Coordinate (v')	0.483

EQUIPMENT LIST

Equipment Used	Model Number	Control Number	Last Date Calibrated	Calibration Due Date
LabSphere Power Supply	LPS-100-0833	000832	05/23/13	05/23/14
LapSphere 3M Integrating Sphere	CA-11821-LRT	000830	VBU	VBU
LabSphere Spectrometer	CDS-3020	000834	VBU	VBU
California Instruments Power Supply	CSW5550	001338	N/A	N/A
Yokogawa Power Meter	WT333	001319	05/10/13	05/10/14
Extech Instruments Stop Watch	N/A	001380	04/22/13	04/22/14
Omega Environmental Monitor	N/A	000886	09/10/13	09/10/14
LSI High Speed Mirror Goniometer	6440T	000943	03/24/14	03/31/14
Elgar Power Supply	CW1251	000944	VBU	VBU
Yokogawa Power Analyzer	WT210	000945	11/14/13	11/14/14
Omega Environmental Monitor	N/A	000882	09/09/13	09/09/14
Extech Instruments Stop Watch	N/A	001380	04/22/13	04/22/14
Tape measure	N/A	000684	12/09/13	12/09/14



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 Labsphere CDS 3020 Spectrometer and Three Meter Sphere was used to measure correlated color temperature, chromaticity coordinates, and the color rendering index 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. Electrical measurements including voltage, current, and power were measured using the Yokogawa Power Analyzer.

The calibration of the sphere spectrometer system is traceable to the National Institute of Standards and Technology.

Photometric and Electrical Measurements – Distribution Method

A LSI Type C High Speed Model 6440 Mirror Goniometer was used to measure the intensity (candelas) at each angle of distribution for each sample.

Ambient temperature was measured equal to the height of the sample mounted on the Goniometer equipment. Each sample was operated at input rated voltage in its designated orientation. Each sample was allowed to stabilize for at least thirty minutes before measurements were made. Electrical measurements including voltage, current, and power were measured using the Yokogawa Power Analyzer.

Some graphics were created with Photometrics Plus software.



RESULTS OF TEST

Photometric and Electrical Measurements at Ambient Temperature (25°C +/- 1°C) - Integrating Sphere Method

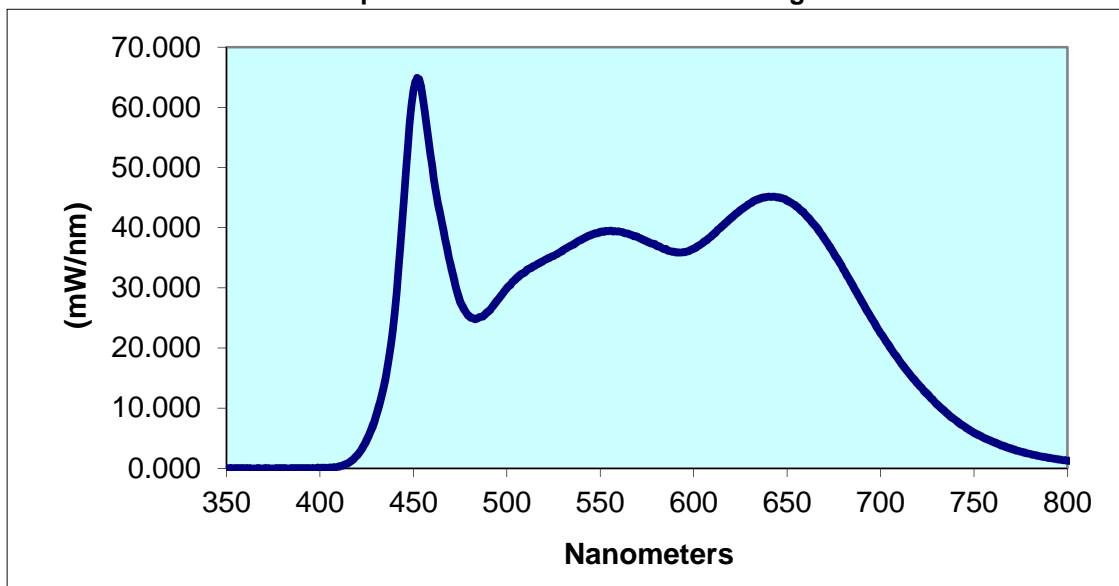
Intertek Sample No.	Base Orientation	Input Voltage {Vac}	Input Current (mA)	Input Power (Watts)	Input Power Factor	Current ATHD (%)	Luminous Flux (Lumens)	Lumen Efficacy (LPW)
LAN1403210902-016	UP	120.0	717.1	85.66	0.995	6.72	3851	44.96

Correlated Color Temperature (K)	CRI -Ra	CRI -R9	DUV	CIE 31' Chromaticity Coordinate (x)	CIE 31' Chromaticity Coordinate (y)	CIE 76' Chromaticity Coordinate (u')	CIE 76' Chromaticity Coordinate (v')
4727	95.5	73.0	0.006	0.352	0.346	0.218	0.483

Spectral Distribution over Visible Wavelengths

nm	mW/nm	nm	mW/nm	nm	mW/nm	nm	mW/nm	nm	mW/nm
350	0.002	440	25.970	530	36.250	620	41.590	710	17.900
355	-0.021	445	45.030	535	37.130	625	42.920	715	15.870
360	0.011	450	62.740	540	38.040	630	44.020	720	14.020
365	-0.051	455	61.780	545	38.800	635	44.800	725	12.310
370	-0.039	460	50.280	550	39.250	640	45.160	730	10.710
375	-0.052	465	41.160	555	39.460	645	45.020	735	9.269
380	-0.015	470	33.710	560	39.350	650	44.500	740	8.005
385	0.012	475	27.730	565	38.990	655	43.540	745	6.885
390	-0.020	480	25.250	570	38.440	660	42.100	750	5.918
395	0.007	485	25.070	575	37.700	665	40.310	755	5.105
400	0.038	490	26.070	580	37.040	670	38.170	760	4.419
405	0.096	495	27.910	585	36.450	675	35.740	765	3.785
410	0.276	500	29.900	590	35.970	680	33.170	770	3.242
415	0.843	505	31.570	595	35.910	685	30.450	775	2.767
420	2.168	510	32.740	600	36.490	690	27.670	780	2.362
425	4.676	515	33.700	605	37.530	695	25.010		
430	8.636	520	34.570	610	38.780	700	22.470		
435	14.880	525	35.300	615	40.200	705	20.140		

Spectral Data Over Visible Wavelengths





RESULTS OF TEST (cont'd)

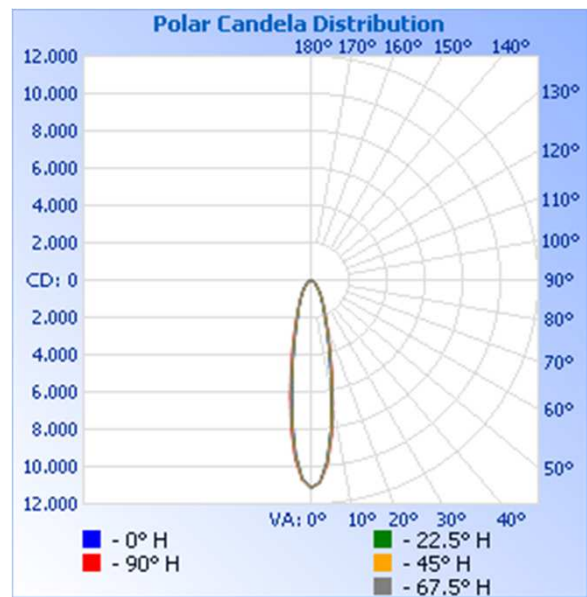
Photometric and Electrical Measurements at Ambient Temperature (25°C +/- 1°C) – Distribution Method

Intertek Sample No.	Base Orientation	Input Voltage {Vac}	Input Current (mA)	Input Power (Watts)	Input Power Factor	Absolute Luminous Flux (Lumens)	Lumen Efficacy (Lumens Per Watt)
LAN1403210902-016	UP	120.0	715.9	85.44	0.994	3762	44.03

Intensity (Candlepower) Summary at 25°C - Candelas

Maximum Candela Value: 11164

Angle	0	22.5	45	67.5	90
0	11137	11164	11142	11139	11126
5	9726	9745	9799	9855	9902
10	6191	6290	6422	6587	6670
15	3585	3651	3727	3846	3940
20	2178	2230	2303	2363	2372
25	1484	1518	1570	1614	1601
30	1050	1076	1137	1165	1141
35	766	775	837	838	818
40	548	568	572	602	591
45	394	390	396	415	431
50	287	285	298	302	293
55	228	224	211	237	237
60	171	165	169	178	165
65	38	123	111	104	46
70	17	62	63	74	42
75	51	77	53	52	38
80	33	52	34	37	32
85	16	47	28	27	19
90	0	6	0	0	5

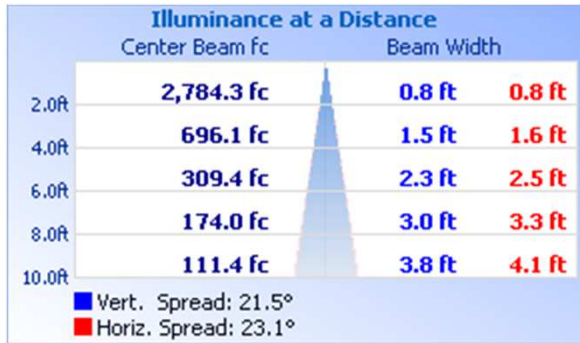


RESULTS OF TEST (cont'd)

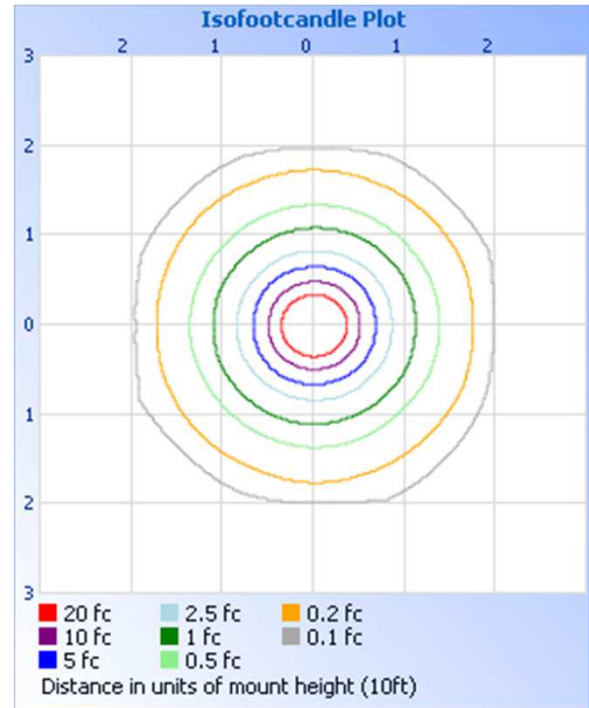
Illumination Plots

Mounting Height: 10 ft.

Illuminance - Cone of Light



Isoillumination Plot



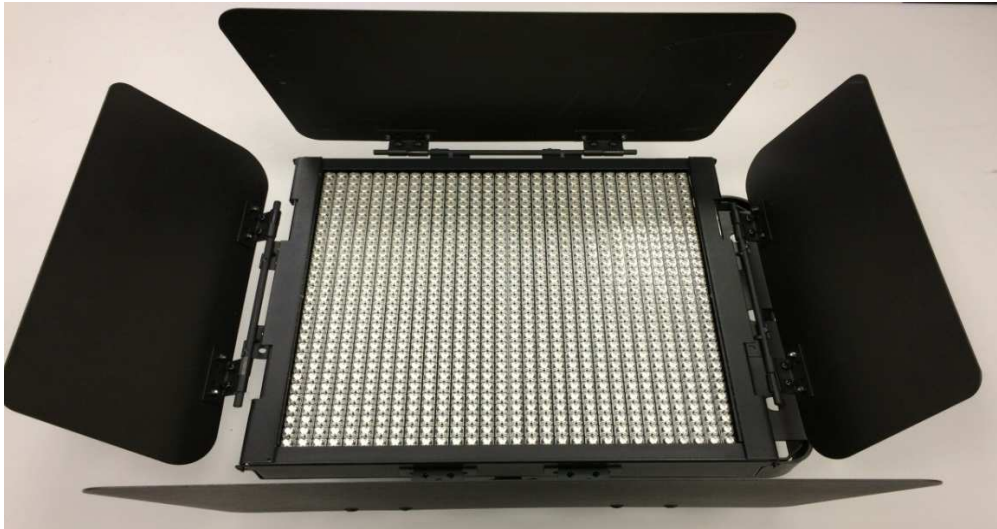
Zonal Lumen Summary and Percentages at 25°C

Zone	Lumens	% Luminaire
0-30	2564	68.2
0-40	3068	81.6
0-60	3582	95.2
60-90	179.5	4.8
0-90	3761	100.0
90-180	0.5	0.0
0-180	3762	100.0

Zonal Lumens and Percentages at 25°C

Zone	Lumens	% Luminaire
0-10	803.9	21.4
10-20	1041	27.7
20-30	719.5	19.1
30-40	504.0	13.4
40-50	313.6	8.3
50-60	199.8	5.3
60-70	98.7	2.6
70-80	55.8	1.5
80-90	25.0	0.7
90-100	0.5	0.0

PICTURE (not to scale)



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:



Jesse Reyna
Technician
Lighting Division

Attachment: None

Report Reviewed By:



Kenda Branch
Engineer
Lighting Division

