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

REPORT

25800 COMMERCENTRE DRIVE, LAKE FOREST, CA 92630

Project No. G101607677 Date: April 29, 2014

REPORT NO. 101607677LAX-005

TEST OF ONE DYNAMIC WHITE LED PAR CW

MODEL NO. OPTI TRI WHITE II

RENDERED TO

ELATION PROFESSIONAL
6122 S. EASTERN AVENUE
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 500519256.

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 prototype sample of model number Opti Tri White II. The sample was received by Intertek on April 25, 2014, in undamaged condition and one sample was tested as received. The sample designation was LAN1404250928-001.

DATES OF TESTS: April 28, 2014 through April 29, 2014.

SUMMARY

Model No.:	Opti Tri White II
Description:	Dynamic White LED PAR CW

	Result	
Criteria	Sphere	Goniometer
Total Lumen Output (Lumens)	1784	1768
Total Power (W)	36.51	36.43
Luminaire Efficacy (LPW)	48.86	48.53

Criteria	Result
Power Factor	0.945
Current ATHD %	22.71
Correlated Color Temperature (CCT - K)	6521
Color Rendering Index (CRI - Ra)	72.8
Color Rendering Index (CRI - R9)	-25.0
DUV	0.004
Chromaticity Coordinate (x)	0.312
Chromaticity Coordinate (y)	0.331
Chromaticity Coordinate (u')	0.197
Chromaticity Coordinate (v')	0.469

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	09/05/13	09/05/14
Omega Environmental Monitor	N/A	000886	09/10/2013	09/10/2014
LSI High Speed Mirror Goniometer	6440T	000943	VBU	VBU
Elgar Power Supply	CW1251	000944	VBU	VBU
Yokogawa Power Analyzer	WT210	000945	11/14/13	11/14/14
Omega Environmental Monitor	iBTHX-W	000886	09/09/13	09/09/14
Tape Measure	33-428	000684	12/09/13	12/09/14
Stopwatch	365510	001380	11/05/2013	11/05/2014

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

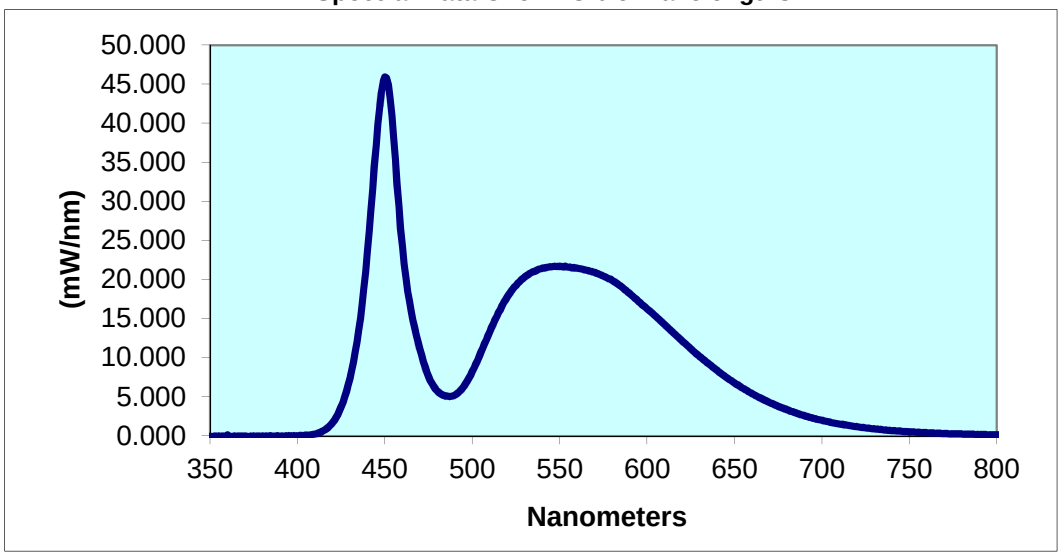
Intertek Sample No.	Base Orientation	Input Voltage {Vac}	Input Current (mA)	Input Power (Watts)	Input Power Factor	Current ATHD (%)	Luminous Flux (Lumens)	Lumen Efficacy (LPW)
LAN1404250928-001	UP	120.0	321.7	36.51	0.945	22.71	1784	48.86

Correlated Color Temperature (K)	CRI -Ra	CRI -R9	DUV	CIE 31' Chromaticity Coordinate	CIE 31' Chromaticity Coordinate (y)	CIE 76' Chromaticity Coordinate (u')	CIE 76' Chromaticity Coordinate (v')
6521	72.8	-25.0	0.004	0.312	0.331	0.197	0.469

Spectral Distribution over Visible Wavelengths

nm	mW/nm	nm	mW/nm	nm	mW/nm	nm	mW/nm	nm	mW/nm
350	-0.021	440	23.520	530	20.360	620	12.150	710	1.540
355	-0.005	445	37.180	535	21.030	625	11.150	715	1.348
360	0.122	450	45.920	540	21.450	630	10.180	720	1.174
365	-0.039	455	38.300	545	21.650	635	9.250	725	1.031
370	-0.041	460	24.210	550	21.670	640	8.384	730	0.900
375	-0.007	465	15.970	555	21.600	645	7.526	735	0.774
380	-0.007	470	11.130	560	21.450	650	6.767	740	0.674
385	-0.012	475	7.561	565	21.230	655	6.066	745	0.603
390	-0.023	480	5.740	570	20.910	660	5.428	750	0.514
395	0.030	485	5.095	575	20.460	665	4.835	755	0.454
400	-0.010	490	5.240	580	19.890	670	4.278	760	0.410
405	0.082	495	6.305	585	19.160	675	3.791	765	0.353
410	0.246	500	8.240	590	18.220	680	3.356	770	0.295
415	0.693	505	10.740	595	17.210	685	2.952	775	0.263
420	1.682	510	13.340	600	16.270	690	2.587	780	0.240
425	3.731	515	15.760	605	15.270	695	2.269		
430	7.382	520	17.800	610	14.250	700	1.998		
435	13.510	525	19.260	615	13.210	705	1.745		

Spectral Data Over Visible Wavelengths



RESULTS OF TEST (cont'd)

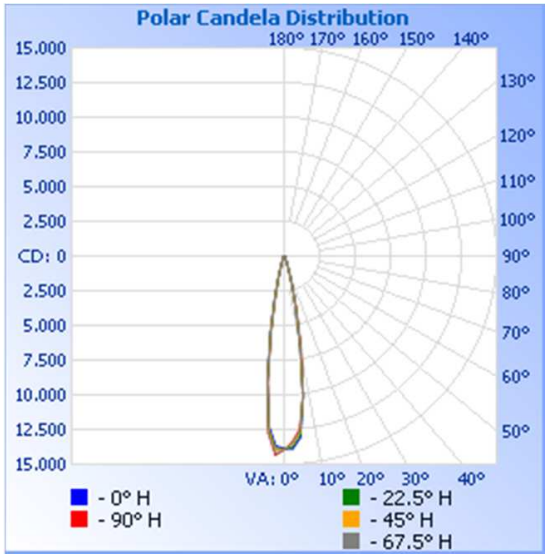
Photometric and Electrical Measurements at Ambient Temperature (25°C +/- 1°C) – Distribution Method

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)
LAN1404250928-001	UP	119.9	321.3	36.43	0.946	1768	48.53

Intensity (Candlepower) Summary at 25°C - Candelas

Maximum Candela Value **14342**

Angle	0	22.5	45	67.5	90
0	13845	13892	13886	13932	13945
5	13111	12952	12754	12634	12504
10	6439	6483	6520	6648	6846
15	1976	2008	1987	2044	2141
20	532	545	540	559	573
25	232	228	250	243	248
30	127	126	144	145	148
35	71	75	78	75	90
40	50	38	47	58	41
45	35	26	50	23	28
50	0	14	14	34	27
55	0	24	12	8	17
60	9	11	4	8	9
65	19	0	4	12	4
70	6	0	0	2	4
75	8	0	7	0	0
80	0	0	7	0	0
85	0	0	0	9	0
90	4	0	0	0	19

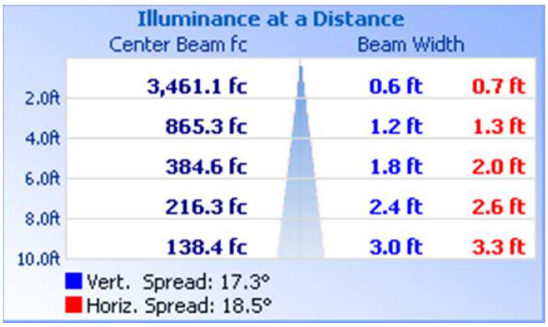


RESULTS OF TEST (cont'd)

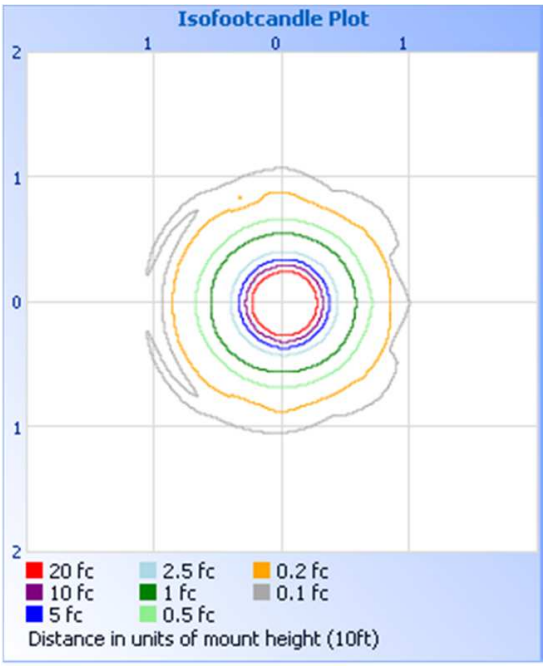
Illumination Plots

Mounting Height: 10 ft.

Illuminance - Cone of Light



Isoillumination Plot



Zonal Lumen Summary and Percentages at 25°C

Zone	Lumens	% Luminaire
0-30	1668	94.3
0-40	1721	97.3
0-60	1759	99.5
60-90	8.8	0.5
0-90	1768	100.0
90-180	0.4	0.0
0-180	1768	100.0

Zonal Lumens and Percentages at 25°C

Zone	Lumens	% Luminaire
0-10	0.0	0.0
10-20	967.8	54.7
20-30	581.1	32.9
30-40	118.8	6.7
40-50	52.9	3.0
50-60	24.5	1.4
60-70	13.8	0.8
70-80	5.0	0.3
80-90	2.2	0.1
100-110	0.4	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:

Erik Linares
Technician
Lighting Division

Report Reviewed By:

Kenda Branch
Engineer
Lighting Division

Attachment: None