



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-001

TEST OF ONE DYNAMIC WHITE LED PAR FULL ON

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.

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SUMMARY

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

Criteria	Result	
	Sphere	Goniometer
Total Lumen Output (Lumens)	3680	3712
Total Power (W)	103.6	102.5
Luminaire Efficacy (LPW)	35.52	36.21

Criteria	Result
Power Factor	0.987
Current ATHD %	11.41
Correlated Color Temperature (CCT - K)	3834
Color Rendering Index (CRI - Ra)	81.9
Color Rendering Index (CRI - R9)	-8.6
DUV	0.008
Chromaticity Coordinate (x)	0.382
Chromaticity Coordinate (y)	0.362
Chromaticity Coordinate (u')	0.232
Chromaticity Coordinate (v')	0.495

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	VBV	VBV
LabSphere Spectrometer	CDS-3020	000834	VBV	VBV
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	09/10/13	09/10/14
LSI High Speed Mirror Goniometer	6440T	000943	VBV	VBV
Elgar Power Supply	CW1251	000944	VBV	VBV
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	11/05/13	11/05/14



## 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**

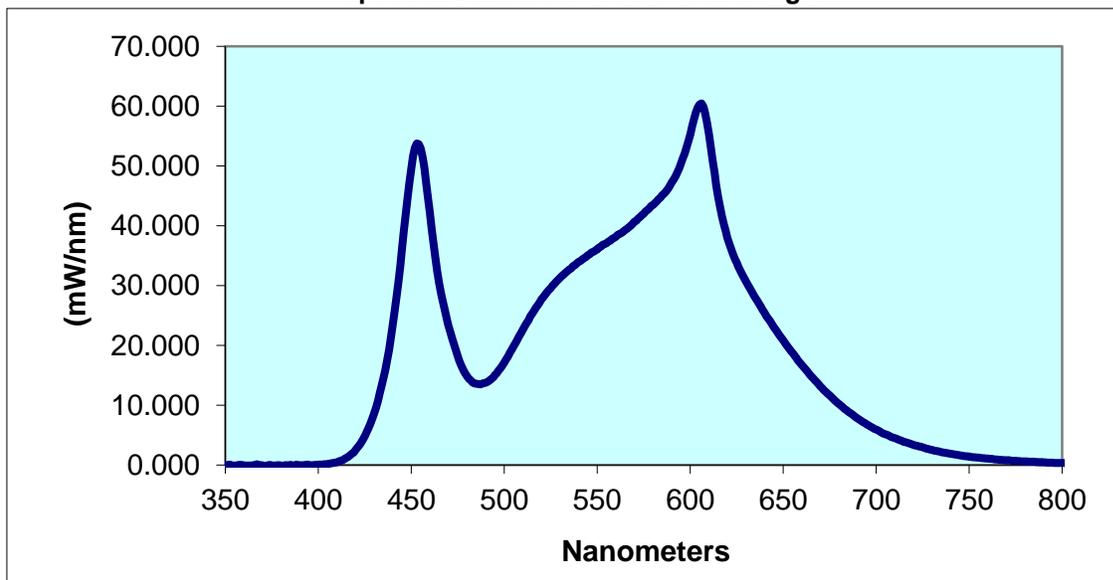
Intertek Sample No.	Base Orientation	Input Voltage {Vac}	Input Current (mA)	Input Power (Watts)	Input Power Factor	Current ATHD (%)	Luminous Flux (Lumens)	Lumen Efficacy (LPW)
LAN1404250928-001	UP	120.1	873.9	103.6	0.987	11.41	3680	35.52

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')
3834	81.9	-8.6	0.008	0.382	0.362	0.232	0.495

**Spectral Distribution over Visible Wavelengths**

nm	mW/nm	nm	mW/nm	nm	mW/nm	nm	mW/nm	nm	mW/nm
350	-0.077	440	23.340	530	31.330	620	38.000	710	4.471
355	-0.075	445	36.010	535	32.670	625	33.800	715	3.871
360	-0.079	450	49.730	540	33.970	630	30.680	720	3.365
365	-0.035	455	52.990	545	35.080	635	27.950	725	2.917
370	-0.059	460	42.150	550	36.080	640	25.450	730	2.497
375	-0.099	465	30.420	555	37.130	645	23.040	735	2.166
380	-0.074	470	23.340	560	38.200	650	20.810	740	1.866
385	0.015	475	18.130	565	39.290	655	18.720	745	1.614
390	-0.076	480	14.790	570	40.670	660	16.710	750	1.395
395	-0.011	485	13.590	575	42.050	665	14.870	755	1.240
400	0.042	490	13.760	580	43.510	670	13.170	760	1.062
405	0.178	495	15.010	585	45.150	675	11.600	765	0.908
410	0.443	500	17.140	590	47.200	680	10.200	770	0.785
415	1.173	505	19.850	595	50.360	685	8.912	775	0.683
420	2.470	510	22.620	600	55.330	690	7.780	780	0.587
425	4.862	515	25.280	605	60.320	695	6.754		
430	8.647	520	27.680	610	55.490	700	5.901		
435	14.510	525	29.600	615	44.900	705	5.100		

**Spectral Data Over Visible Wavelengths**



RESULTS OF TEST (cont'd)

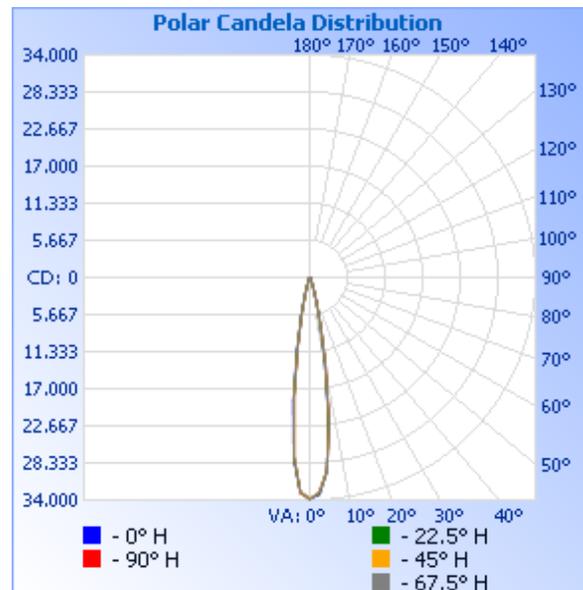
Photometric and Electrical Measurements at Ambient Temperature (25°C +/- 1°C) – Distribution Method

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	120.0	865.6	102.5	0.987	3712	36.21

Intensity (Candlepower) Summary at 25°C - Candelas

Maximum Candela Value **33885**

Angle	0	22.5	45	67.5	90
0	33724	33783	33757	33885	33834
5	29628	29566	29579	29697	29584
10	12895	13022	13329	13621	13800
15	3758	3793	3886	3946	4065
20	1053	1046	1063	1096	1123
25	488	478	493	492	509
30	283	295	294	312	310
35	170	169	191	178	173
40	106	100	108	104	117
45	74	79	69	74	75
50	51	46	60	57	65
55	32	31	40	36	47
60	30	30	34	38	29
65	9	13	9	8	21
70	26	3	20	5	10
75	0	15	1	11	5
80	7	5	7	7	0
85	10	12	0	11	4
90	1	0	0	5	0

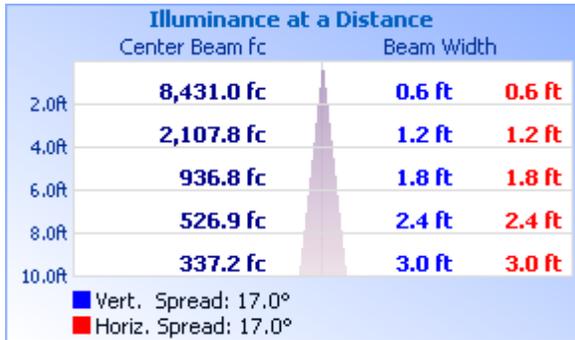


RESULTS OF TEST (cont'd)

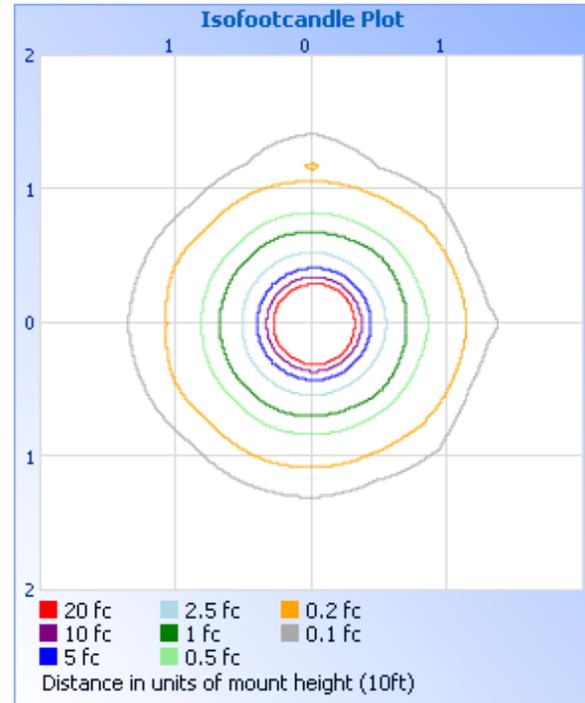
Illumination Plots

Mounting Height: 10 ft.

Illuminance - Cone of Light



Isoillumination Plot



Zonal Lumen Summary and Percentages at 25°C

Zone	Lumens	% Luminaire
0-30	3482	93.8
0-40	3594	96.8
0-60	3687	99.3
60-90	25.1	0.7
0-90	3712	100.0
90-180	0.2	0.0
0-180	3712	100.0

Zonal Lumens and Percentages at 25°C

Zone	Lumens	% Luminaire
0-10	2114	56.9
10-20	1129	30.4
20-30	239.4	6.4
30-40	112.2	3.0
40-50	57.9	1.6
50-60	34.3	0.9
60-70	14.2	0.4
70-80	6.6	0.2
80-90	4.4	0.1
90-100	0.2	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

Attachment: None

Report Reviewed By:



Kenda Branch  
Engineer  
Lighting Division