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-007

TEST OF ONE DYNAMIC WHITE LED PAR AMBER

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 Amber

	Result	
Criteria	Sphere	Goniometer
Total Lumen Output (Lumens)	939.1	975.1
Total Power (W)	28.77	28.80
Luminaire Efficacy (LPW)	32.64	33.86

Criteria	Result
Power Factor	0.926
Current ATHD %	26.79
Correlated Color Temperature (CCT - K)	1398
Color Rendering Index (CRI - Ra)	-20.8
Color Rendering Index (CRI - R9)	-372.8
DUV	0.002
Chromaticity Coordinate (x)	0.606
Chromaticity Coordinate (y)	0.393
Chromaticity Coordinate (u')	0.372
Chromaticity Coordinate (v')	0.544

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	09/10/13	09/10/14
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	11/05/13	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

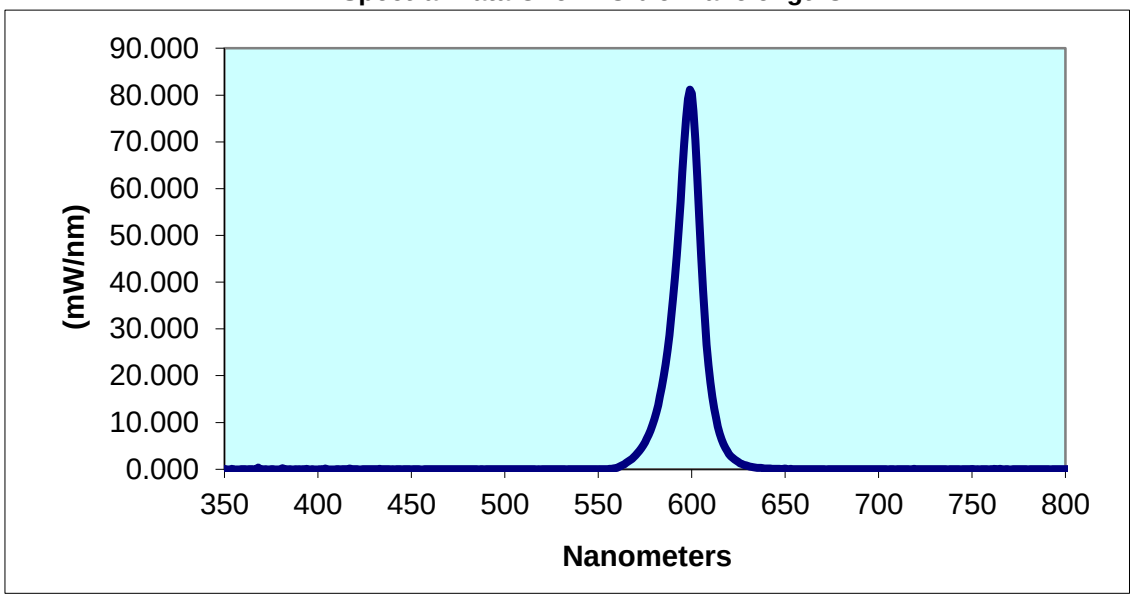
Intertek Sample No.	Base Orientation	Input Voltage {Vac}	Input Current (mA)	Input Power (Watts)	Input Power Factor	Current ATHD (%)	Luminous Flux (Lumens)	Lumen Efficacy (LPW)
LAN1404250928-001	UP	120.1	258.8	28.77	0.926	26.79	939.1	32.64

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')
1398	-20.8	-372.8	0.002	0.606	0.393	0.372	0.544

Spectral Distribution over Visible Wavelengths

nm	mW/nm	nm	mW/nm	nm	mW/nm	nm	mW/nm	nm	mW/nm
350	0.073	440	-0.005	530	0.007	620	3.267	710	0.004
355	-0.106	445	-0.016	535	0.002	625	1.512	715	0.013
360	0.014	450	-0.060	540	-0.002	630	0.680	720	0.002
365	0.004	455	-0.020	545	0.009	635	0.316	725	-0.011
370	0.043	460	-0.010	550	-0.017	640	0.169	730	0.004
375	0.018	465	-0.013	555	0.033	645	0.095	735	0.016
380	-0.003	470	-0.012	560	0.321	650	0.124	740	0.010
385	0.011	475	0.004	565	1.359	655	0.031	745	-0.008
390	-0.011	480	0.003	570	2.994	660	0.035	750	0.008
395	-0.041	485	-0.001	575	5.752	665	0.002	755	-0.002
400	-0.033	490	-0.005	580	10.710	670	0.002	760	0.002
405	-0.021	495	-0.002	585	19.830	675	0.004	765	0.089
410	-0.008	500	-0.006	590	36.320	680	0.007	770	-0.017
415	-0.006	505	0.011	595	63.340	685	0.003	775	-0.002
420	0.007	510	-0.006	600	80.350	690	-0.001	780	-0.047
425	-0.005	515	0.016	605	45.710	695	0.036		
430	0.032	520	-0.011	610	18.570	700	-0.010		
435	-0.009	525	-0.008	615	7.626	705	-0.023		

Spectral Data Over Visible Wavelengths



RESULTS OF TEST (cont'd)

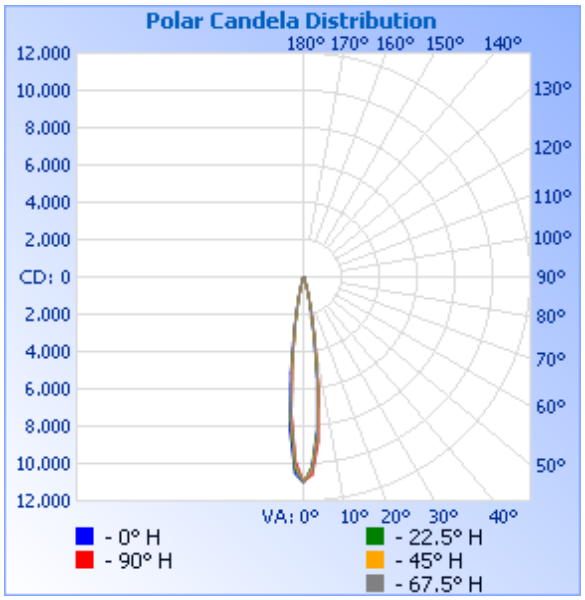
Photometric and Electrical Measurements at Ambient Temperature (25°C +/- 1°C) – Distribution Method

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	258.9	28.80	0.927	975.1	33.86

Intensity (Candlepower) Summary at 25°C - Candelas

Maximum Candela Value 11045

Angle	0	22.5	45	67.5	90
0	11045	11000	10984	11014	10972
5	8173	8314	8454	8671	8894
10	3126	3295	3368	3401	3511
15	896	954	954	969	997
20	255	259	260	261	270
25	121	122	125	132	130
30	76	73	78	85	90
35	44	43	46	49	52
40	27	27	28	30	30
45	17	16	17	19	19
50	12	13	13	12	13
55	9	8	8	10	10
60	7	5	6	6	8
65	2	3	4	5	5
70	1	2	2	3	3
75	1	1	1	1	1
80	1	0	0	0	0
85	0	0	0	1	1
90	0	0	0	0	0

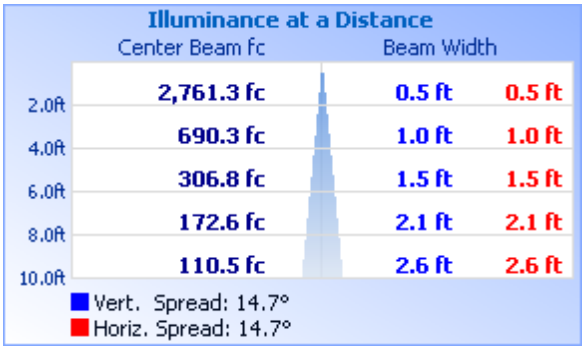


RESULTS OF TEST (cont'd)

Illumination Plots

Mounting Height: 10 ft.

Illuminance - Cone of Light



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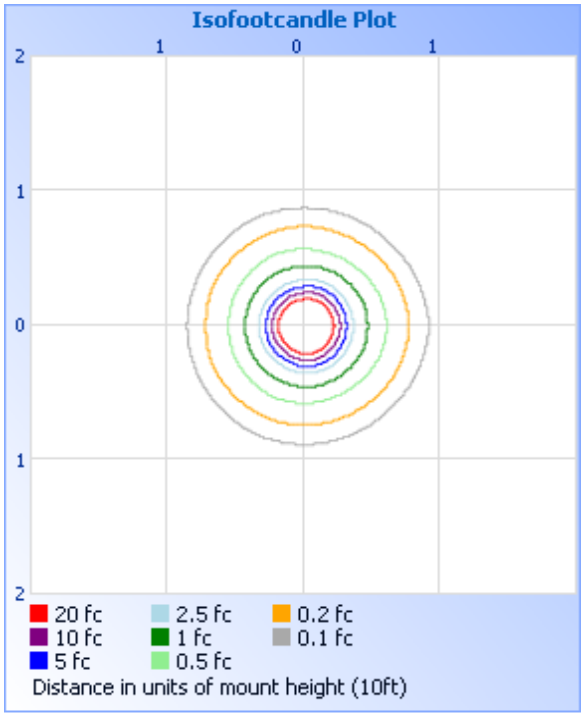

Zonal Lumen Summary and Percentages at 25°C

Zone	Lumens	% Luminaire
0-30	919.9	94.3
0-40	948.9	97.3
0-60	970.5	99.5
60-90	4.6	0.5
0-90	975.1	100.0
90-180	0.0	0.0
0-180	975.1	100.0

Zonal Lumens and Percentages at 25°C

Zone	Lumens	% Luminaire
0-10	587.2	60.2
10-20	273.5	28.0
20-30	59.2	6.1
30-40	29.0	3.0
40-50	13.9	1.4
50-60	7.7	0.8
60-70	3.4	0.3
70-80	1.0	0.1
80-90	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:

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Lighting Division

Report Reviewed By:

Kenda Branch
Engineer
Lighting Division

Attachment: None