FOR THE SCOPE OF
ACCREDITATION UNDER NVLAP LAB
CODE 100402-0.

REPORT

3933 US ROUTE 11, CORTLAND, NEW YORK 13045

Project No. G103088115 Date: June 30, 2017

REPORT NO. 103088115CRT-052

TEST OF ONE FLOOD FIXTURE WITH 36 LEDS, 4000K, 10X40DEG DIFFUSER.
SAMPLE #5

MODEL NO. EW REACHELITE POWERCORE, 100W, 4000K, 10X40 DEGREE BEAM DIFFUSER, ALL LEDS ON

RENDERED TO:

PHILIPS COLOR KINETICS
3 BURLINGTON WOODS DRIVE
BURLINGTON, MA 01803

TESTS: 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 NVLAP, NIST, or any agency of the federal government.

AUTHORIZATION The testing performed was authorized by signed quote number Qu-00783021.

STANDARDS USED:

IESNA LM-79 - 2008: Electrical and Photometric Measurements of Solid State Lighting
ANSI NEMA ANSLG C78.377: 2015: Specifications of the Chromaticity of Solid State Lighting Products

DESCRIPTION OF SAMPLE: The client submitted one production sample of model number eW ReachElite Powercore, 100W, 4000K, 10x40 Degree Beam Diffuser, All LEDs On. The sample was received by Intertek on May 22, 2017 in undamaged condition and one sample was tested as received. The sample designation was CRT1705221531-002.

DATE OF TESTS: June 8, 2017 through June 14, 2017.

SUMMARY:

MODEL NO. eW ReachElite Powercore, 100W, 4000K, 10x40 Degree Beam Diffuser, All LEDs On
DESCRIPTION: Flood Fixture with 36 LEDs, 4000K, 10x40deg Diffuser. Sample #5

Criteria	Integrating Sphere	Goniophotometer
Light Output (Lumens)	5155.7	5032.3
Total Power (W)	97.90	97.25
Lumen Efficacy (Lm/W)	52.7	51.7
Power Factor ( )	0.988	0.989
Current ATHD (%)	12.69	
Correlated Color Temp. (CCT-K)	3937	
Color Rendering Index (CRI - Ra)	80.6	
CRI - R9	5.1	
DUV ( )	0.004	
Chromaticity Coordinate (x)	0.386	
Chromaticity Coordinate (y)	0.389	
Chromaticity Coordinate (u')	0.224	
Chromaticity Coordinate (v')	0.508	

EQUIPMENT LIST

Equipment Used	Model No.	Control No.	Last Cal.	Cal. Due
LSI High Speed Mirror Goniometer	6440	---	6/2/2017	7/2/2017
Elgar AC Power Supply	CW1251	---	VBU	VBU
Sorenson DC Power Supply	XG 150-10	---	VBU	VBU
Yokogawa Power Analyzer	WT210	E464	5/2/2017	5/2/2018
Omega Thermometer	DPi8-C24	M263	5/2/2017	5/2/2018
M-D Building Products Digital Level	Smart Tool	L112	4/4/2017	4/4/2018
NIST Luminous Intensity Standard Source	NBS10322	N1427	1/9/2017	1/9/2019
NIST Luminous Intensity Standard Source	NBS10332	N1435	1/9/2017	1/9/2019
NIST Luminous Intensity Standard Source	NBS10265	N1437	1/9/2017	1/9/2019
NIST Luminous Flux Standard Source	NBS10428	N1424	1/11/2017	1/11/2019
Elgar AC Power Supply	CW1251	---	VBU	VBU
Sorenson DC Power Supply	XFR 150-8	---	VBU	VBU
Yokogawa Power Analyzer	WT1600	E474	5/4/2017	5/4/2018
Fluke Thermometer	53 II	D587	12/29/2016	12/29/2017
Fluke Multimeter	87V	D590	4/28/2017	4/28/2018
3M Integrating Sphere Spectrometer System	CDS 1100	---	6/2/2017	7/2/2017
Fisher Scientific Stopwatch	130471471	N1404	12/29/2016	12/19/2017
Secondary Spectral Intensity Standard Source	BS5186	RF5186	1/28/2017	1/28/2018
Secondary Luminous Flux Standard Source	BS3616	--	1/28/2017	1/28/2018
Secondary Luminous Flux Standard Source	BS4116	--	1/28/2017	1/28/2018
Secondary Luminous Flux Standard Source	6836	--	1/28/2017	1/28/2018

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 Model CDS 1100 CCD Array Spectroradiometer and two meter or ten foot 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. Stabilization procedures to LM-79 were followed. Electrical measurements including voltage, current, and power were measured using a power analyzer.

The calibration of the sphere photometer-spectroradiometer 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 the SSL sample.

Ambient temperature was measured equal to the height of the sample mounted on the goniometer equipment. The SSL sample was operated on the client provided driver at rated input volts in its designated orientation. The SSL sample was allowed to stabilize for at least thirty minutes before measurements were made. Stabilization procedures to LM-79 were followed. Electrical measurements including voltage, current, and power were measured using a power analyzer.

RESULTS:

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

Intertek Control No.	Base Orientation	Input Voltage (VAC)	Input Current (mA)	Input Power (W)	Input Power Factor ( )	Light Output (Lumens)	Lumen Efficacy (lm/W)
CRT1705221531-002	Base Up	120.11	818.8	97.25	0.989	5032.3	51.7

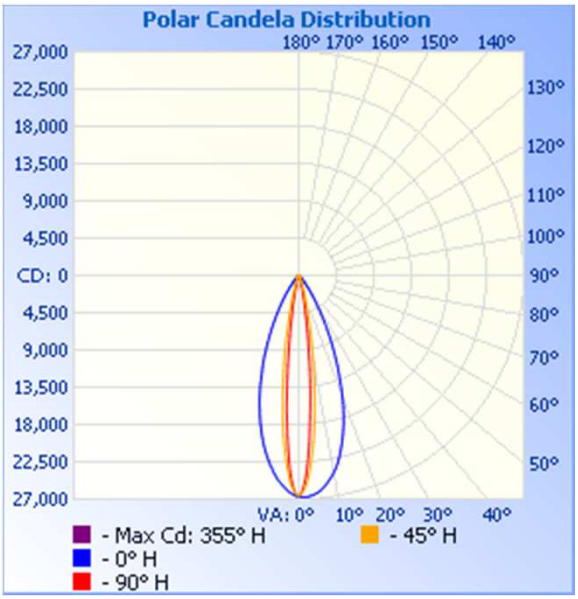
Maximum Cd: 26,800.7 at Horizontal: 355°, Vertical: 1.5°

Luminous Opening: (L: 18.5", W: 4.75")

Intensity (Candlepower) Summary at 25℃ - Candelas

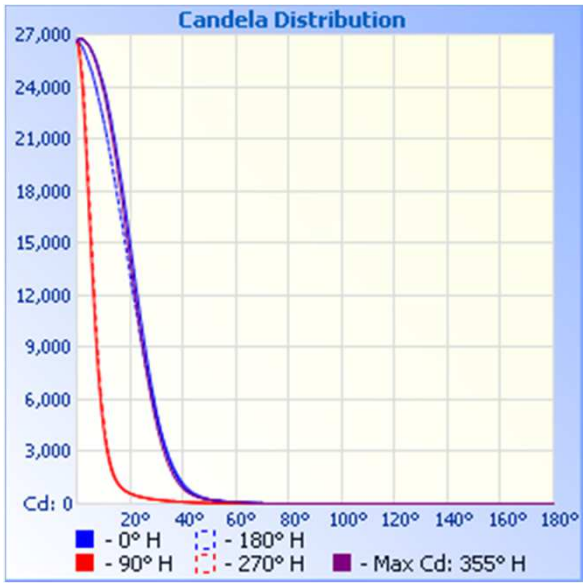
Angle	0	30	45	65	90
0	26556	26556	26556	26556	26556
5	26260	22753	20078	17198	15681
10	24122	14669	9489	5766	4470
15	20242	7266	3318	1669	1273
20	15145	3033	1244	715	594
25	9749	1280	632	427	374
30	5323	645	393	280	244
35	2507	390	264	193	166
40	1064	266	182	125	114
45	475	177	130	90	72
50	263	130	100	58	44
55	156	88	53	29	19
60	105	62	29	24	6
65	62	33	9	0	0
70	43	14	0	0	0
75	13	0	0	0	0
80	0	0	0	0	0
85	0	0	0	0	0
90	0	0	0	0	0

Polar Candela Plot

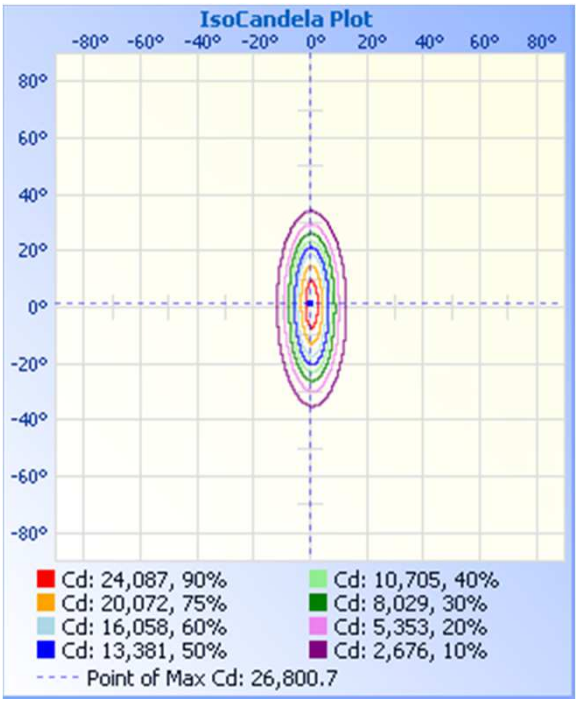


RESULTS:

Cartesian Candela Distribution Plot



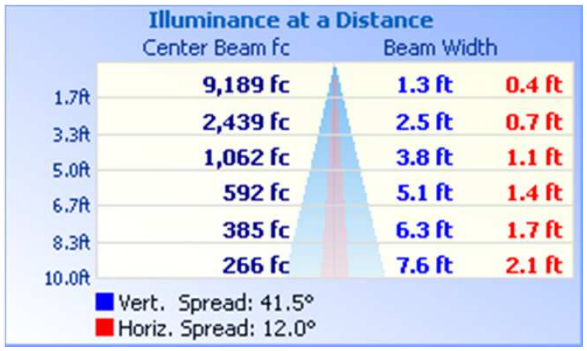
Isocandela Plot



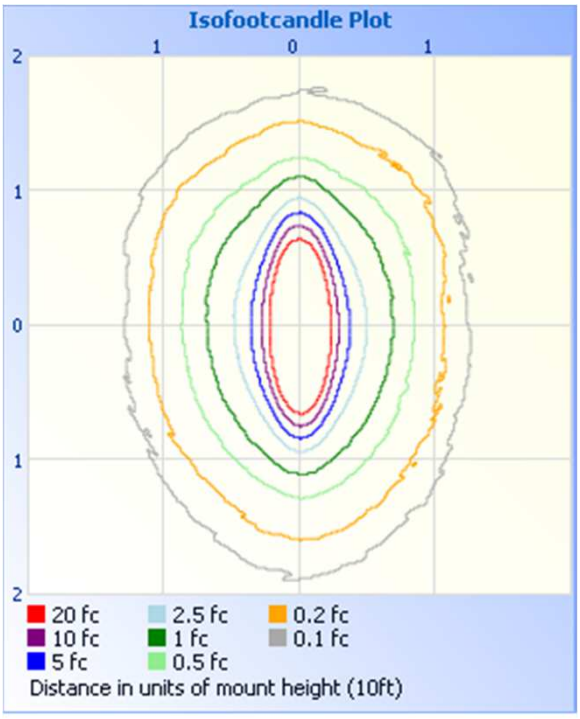
Isoillumination Plots

Mounting Height: 10ft

Illuminance - Cone of Light



Isoillumination Plot



Luminance Data (cd/sq.m)

Angles In Degrees	Average 0-Deg	Average 45-Deg	Average 90-Deg
45	11732	3210	1780
55	4751	1616	569
65	2573	364	0
75	870	0	0
85	0	0	0

RESULTS:

Zonal Lumen Summary and Percentages at 25℃

Zone	Lumens	% Luminaire
0-30	4426.7	88.0
0-40	4793.0	95.2
0-60	5006.1	99.5
0-90	5032.3	100.0
60-90	26.3	0.5
70-100	1.8	0.0
90-120	0.0	0.0
90-180	0.0	0.0
0-180	5032.3	100.0

Zonal Lumens and Percentages at 25℃

Zone	Lumens	% Luminaire
0-10	1655.5	32.9
10-20	1820.9	36.2
20-30	950.3	18.9
30-40	366.3	7.3
40-50	144.6	2.9
50-60	68.5	1.4
60-70	24.4	0.5
70-80	1.8	0.0
80-90	0.0	0.0

Coefficients of Utilization

Coefficients Of Utilization - Zonal Cavity Method

Effective Floor Cavity Reflectance: 20%

RCC %:	80				70				50			30			10			0
RW %:	70	50	30	0	70	50	30	0	50	30	20	50	30	20	50	30	20	0
RCR: 0	1.19	1.19	1.19	1.19	1.16	1.16	1.16	1.00	1.11	1.11	1.11	1.06	1.06	1.06	1.02	1.02	1.02	1.00
1	1.15	1.12	1.10	1.08	1.12	1.10	1.08	.96	1.06	1.05	1.03	1.03	1.01	1.00	.99	.98	.98	.96
2	1.10	1.06	1.03	1.00	1.08	1.05	1.02	.92	1.02	.99	.97	.99	.97	.95	.96	.95	.93	.92
3	1.06	1.01	.97	.94	1.05	1.00	.96	.89	.97	.94	.92	.95	.93	.91	.93	.91	.89	.88
4	1.03	.97	.92	.89	1.01	.96	.92	.85	.94	.90	.87	.92	.89	.87	.90	.88	.86	.84
5	.99	.93	.88	.85	.98	.92	.87	.82	.90	.86	.84	.89	.85	.83	.87	.84	.82	.81
6	.96	.89	.84	.81	.94	.88	.84	.79	.87	.83	.80	.86	.82	.80	.84	.81	.79	.78
7	.93	.86	.81	.78	.92	.85	.81	.76	.84	.80	.77	.83	.79	.77	.82	.79	.76	.75
8	.90	.83	.78	.75	.89	.82	.78	.74	.81	.77	.74	.80	.77	.74	.79	.76	.74	.73
9	.87	.80	.75	.72	.86	.79	.75	.71	.79	.75	.72	.78	.74	.72	.77	.74	.72	.70
10	.85	.77	.73	.70	.84	.77	.73	.69	.76	.72	.70	.76	.72	.70	.75	.72	.69	.68

Flood Summary

Flood Summary

	Efficiency	Lumens	Horizontal Spread	Vertical Spread
Field (10%):	82.5%	4,150.0	24.3	69.5
Beam (50%):	42.9%	2,158.9	12	41.5
Total:	100.7%	5,068.4		

RESULTS:

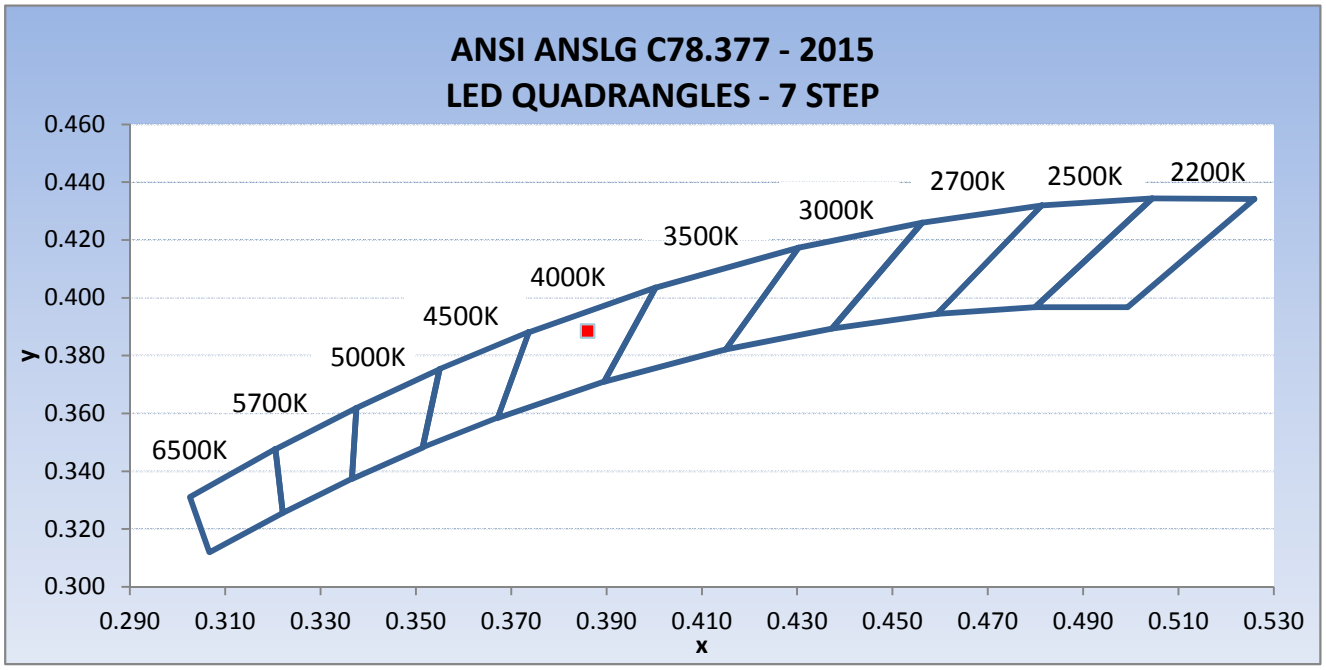
Photometric and Electrical Measurements at Ambient Temperature (25℃ +/- 1℃) – Integrating Sphere Met hod

Intertek Control No.	Base Orientation	Input Voltage (VAC)	Input Current (mA)	Input Power (W)	Input Power Factor ( )	Current ATHD (%)
CRT1705221531-002	Base Up	120.04	825.3	97.90	0.988	12.69

Light Output (Lumens)	Lumen Efficacy (lm/W)	Correlated Color Temperature - CCT (K)	CRI -Ra	CRI -R9	DUV ( )
5155.7	52.7	3937	80.6	5.1	0.004

CIE 31' Chromaticity Coordinate (x)	CIE 31' Chromaticity Coordinate (y)	CIE 76' Chromaticity Coordinate (u')	CIE 76' Chromaticity Coordinate (v')
0.386	0.389	0.224	0.508

ANSI C78.377 SSL Chromaticity (2015 Version)

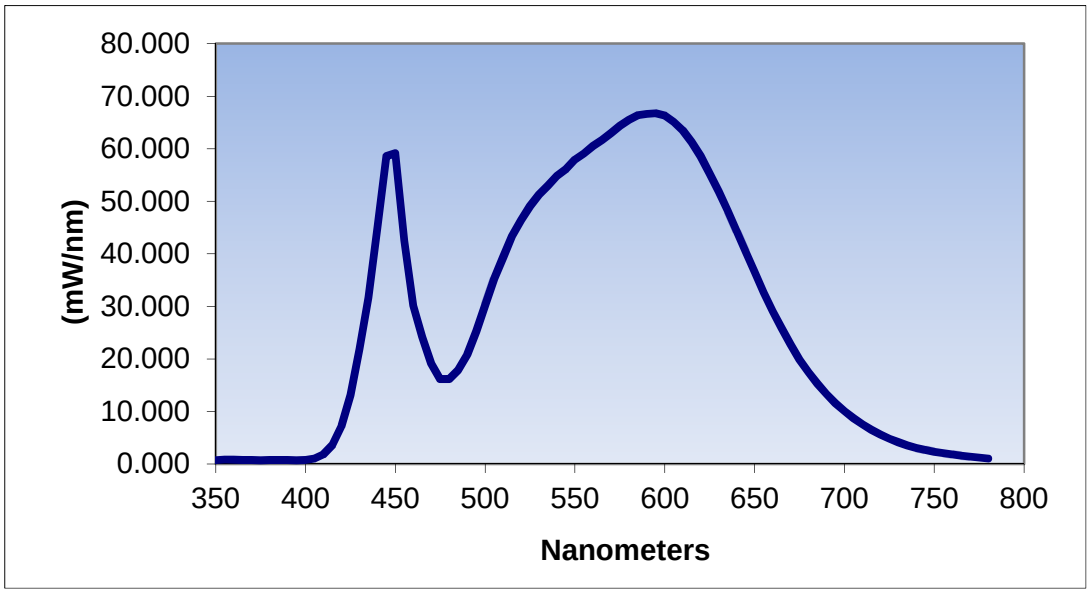


RESULTS

Spectral Distribution Over Visible Wavelengths

nm	mW/nm	nm	mW/nm	nm	mW/nm	nm	mW/nm
350	0.752	460	30.126	570	62.963	680	17.496
355	0.857	465	24.185	575	64.343	685	15.287
360	0.829	470	19.129	580	65.443	690	13.356
365	0.755	475	16.147	585	66.361	695	11.581
370	0.728	480	16.163	590	66.648	700	10.061
375	0.686	485	17.876	595	66.719	705	8.744
380	0.715	490	20.836	600	66.322	710	7.542
385	0.732	495	25.215	605	65.096	715	6.500
390	0.714	500	30.266	610	63.507	720	5.631
395	0.691	505	35.252	615	61.270	725	4.792
400	0.768	510	39.361	620	58.573	730	4.128
405	1.047	515	43.348	625	55.321	735	3.563
410	1.829	520	46.430	630	51.821	740	3.081
415	3.629	525	49.102	635	48.207	745	2.695
420	7.259	530	51.310	640	44.275	750	2.335
425	13.130	535	52.974	645	40.410	755	2.077
430	21.882	540	54.814	650	36.535	760	1.822
435	31.696	545	56.066	655	32.659	765	1.591
440	44.977	550	57.898	660	29.090	770	1.411
445	58.575	555	59.063	665	25.906	775	1.235
450	59.143	560	60.545	670	22.795	780	1.076
455	42.513	565	61.626	675	19.886		

Spectral Data Over Visible Wavelengths



PRODUCT PICTURE:

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:

Ryan Siddon

Ryan Siddon
Project Engineer
Lighting Division

Report Reviewed By:

Melanie Brittain

Melanie Brittain
Associate Engineer
Lighting Division

Attachments:
Gonio IES File - eW ReachElite Powercore, 100W, 4000K, 10x40 Degree Beam Diffuser, All LEDs On
Sphere Raw CSV File - eW ReachElite Powercore, 100W, 4000K, 10x40 Degree Beam Diffuser, All LEDs On