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-049

TEST OF ONE FLOOD FIXTURE WITH 36 LEDS, 4000K, 40DEG DIFFUSER.
SAMPLE #5

MODEL NO. EW REACHELITE POWERCORE, 100W, 4000K, 40 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, 40 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, 40 Degree Beam Diffuser, All LEDs On
DESCRIPTION: Flood Fixture with 36 LEDs, 4000K, 40deg Diffuser. Sample #5

Criteria	Integrating Sphere	Goniophotometer
Light Output (Lumens)	5125.8	5049.2
Total Power (W)	97.90	97.19
Lumen Efficacy (Lm/W)	52.4	52.0
Power Factor ( )	0.988	0.989
Current ATHD (%)	12.69	
Correlated Color Temp. (CCT-K)	3950	
Color Rendering Index (CRI - Ra)	80.7	
CRI - R9	5.5	
DUV ( )	0.004	
Chromaticity Coordinate (x)	0.385	
Chromaticity Coordinate (y)	0.388	
Chromaticity Coordinate (u')	0.224	
Chromaticity Coordinate (v')	0.507	

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°C +/- 1°C) – 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	120.09	818.7	97.19	0.989	5049.2	52.0

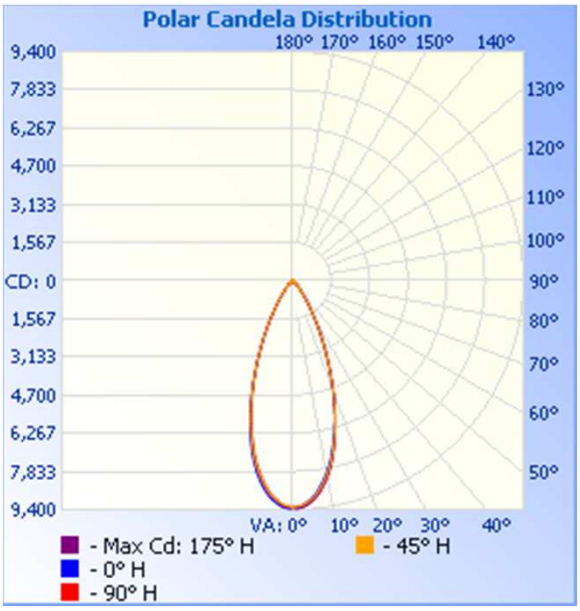
Maximum Cd: 9,351.2 at Horizontal: 175°, Vertical: 0.5°

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

Intensity (Candlepower) Summary at 25°C - Candelas

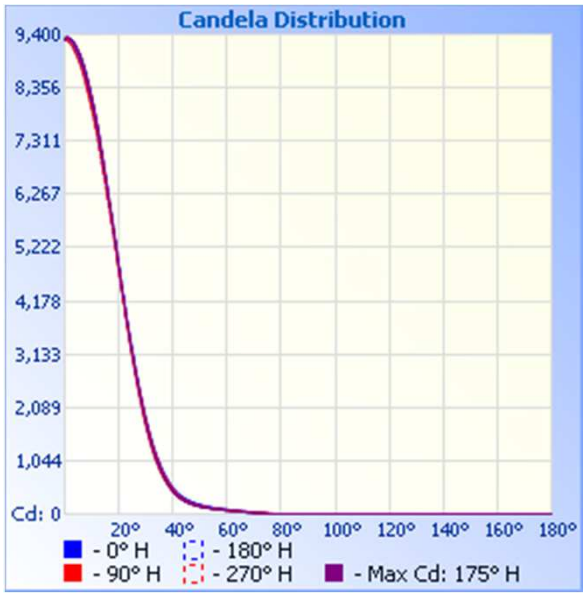
Angle	0	30	45	65	90
0	9290	9290	9290	9290	9290
5	8941	8948	8977	9030	9070
10	7976	8016	8060	8113	8151
15	6516	6556	6591	6616	6618
20	4819	4827	4838	4836	4801
25	3178	3159	3146	3118	3060
30	1865	1832	1817	1776	1717
35	1001	971	948	913	873
40	517	498	479	456	434
45	290	276	263	247	237
50	183	177	167	156	151
55	127	122	116	106	105
60	92	88	83	76	75
65	61	60	56	51	50
70	36	37	34	30	30
75	14	16	15	12	13
80	0	0	0	0	0
85	0	0	0	0	0
90	0	0	0	0	0

Polar Candela Plot

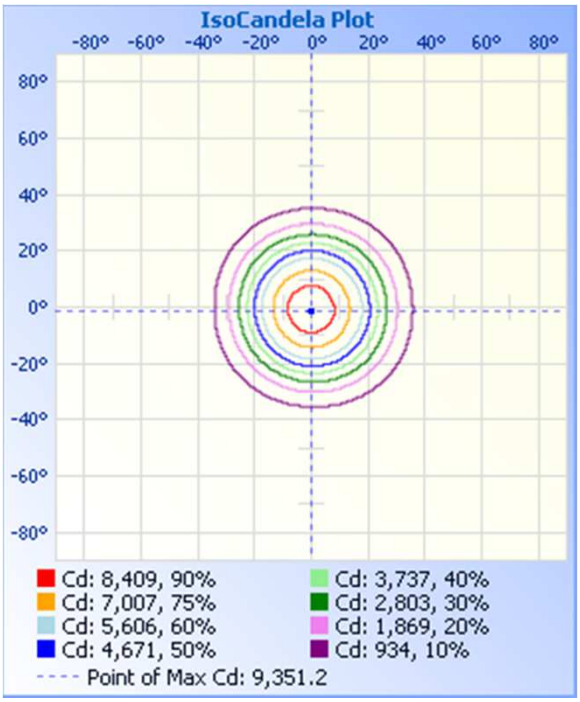


RESULTS:

Cartesian Candela Distribution Plot



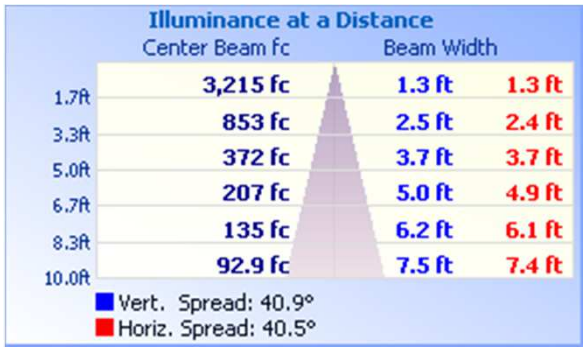
Isocandela Plot



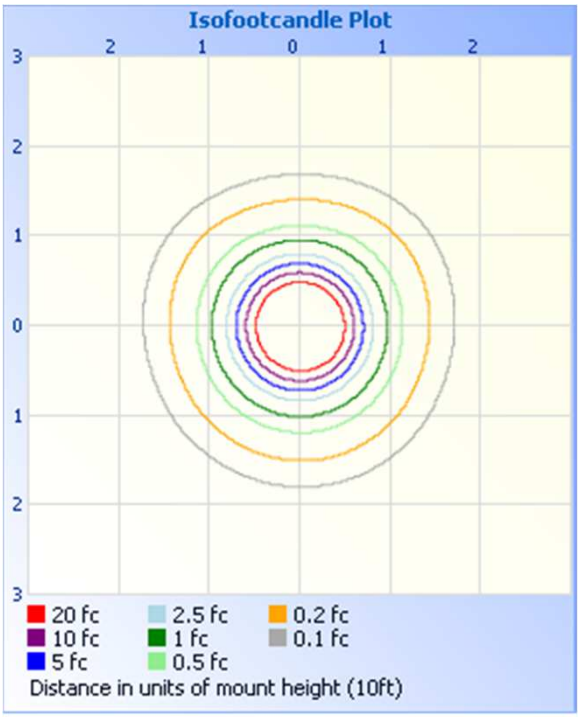
Isoillumination Plots

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	7170	6486	5854
55	3862	3534	3196
65	2516	2330	2082
75	911	1019	884
85	0	0	0

RESULTS:

Zonal Lumen Summary and Percentages at 25°C

Zone	Lumens	% Luminaire
0-30	4044.5	80.1
0-40	4661.0	92.3
0-60	4977.2	98.6
0-90	5049.2	100.0
60-90	72.0	1.4
70-100	15.9	0.3
90-120	0.0	0.0
90-180	0.0	0.0
0-180	5049.2	100.0

Zonal Lumens and Percentages at 25°C

Zone	Lumens	% Luminaire
0-10	825.5	16.3
10-20	1791.2	35.5
20-30	1427.8	28.3
30-40	616.5	12.2
40-50	211.8	4.2
50-60	104.4	2.1
60-70	56.1	1.1
70-80	15.9	0.3
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	1.14	1.11	1.09	1.07	1.11	1.09	1.07	.95	1.05	1.03	1.02	1.01	1.00	.99	.98	.97	.96	.94
2	1.09	1.04	1.00	.97	1.06	1.02	.99	.89	.99	.96	.94	.96	.94	.92	.93	.92	.90	.88
3	1.04	.98	.93	.89	1.02	.96	.92	.84	.94	.90	.87	.91	.88	.86	.89	.87	.85	.83
4	.99	.92	.87	.83	.97	.91	.86	.79	.89	.85	.81	.87	.83	.81	.85	.82	.80	.78
5	.95	.87	.81	.78	.93	.86	.81	.75	.84	.80	.76	.83	.79	.76	.81	.78	.75	.74
6	.90	.82	.77	.73	.89	.82	.76	.71	.80	.76	.72	.79	.75	.72	.77	.74	.71	.70
7	.87	.78	.73	.69	.85	.77	.72	.67	.76	.72	.68	.75	.71	.68	.74	.70	.67	.66
8	.83	.74	.69	.65	.82	.74	.69	.64	.73	.68	.65	.72	.68	.64	.71	.67	.64	.63
9	.80	.71	.65	.62	.79	.70	.65	.61	.69	.65	.62	.69	.64	.61	.68	.64	.61	.60
10	.77	.68	.62	.59	.76	.67	.62	.58	.66	.62	.59	.66	.61	.58	.65	.61	.58	.57

Flood Summary

Flood Summary

	Efficiency	Lumens	Horizontal Spread	Vertical Spread
Field (10%):	88.1%	4,446.4	69.9	70.5
Beam (50%):	52.7%	2,663.4	40.5	40.9
Total:	100%	5,051.5		

RESULTS:

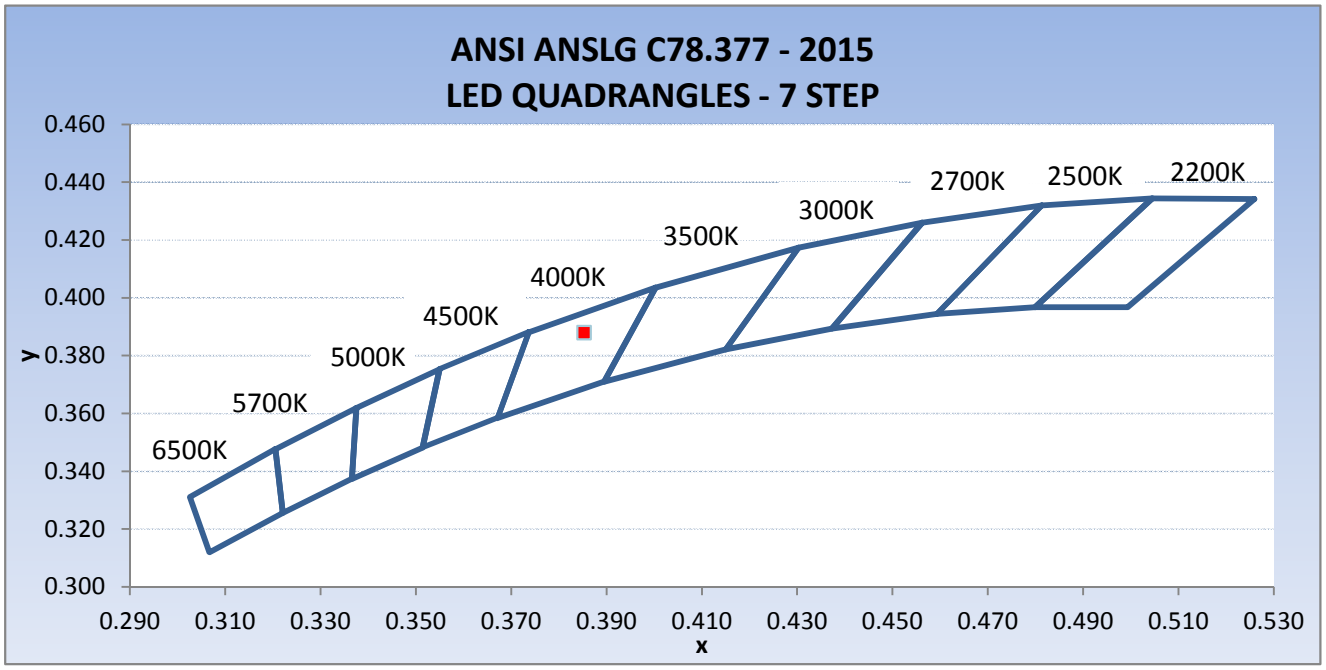
Photometric and Electrical Measurements at Ambient Temperature (25°C +/- 1°C) – Integrating Sphere Method

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 ( )
5125.8	52.4	3950	80.7	5.5	0.004

CIE 31' Chromaticity Coordinate (x)	CIE 31' Chromaticity Coordinate (y)	CIE 76' Chromaticity Coordinate (u')	CIE 76' Chromaticity Coordinate (v')
0.385	0.388	0.224	0.507

ANSI C78.377 SSL Chromaticity (2015 Version)

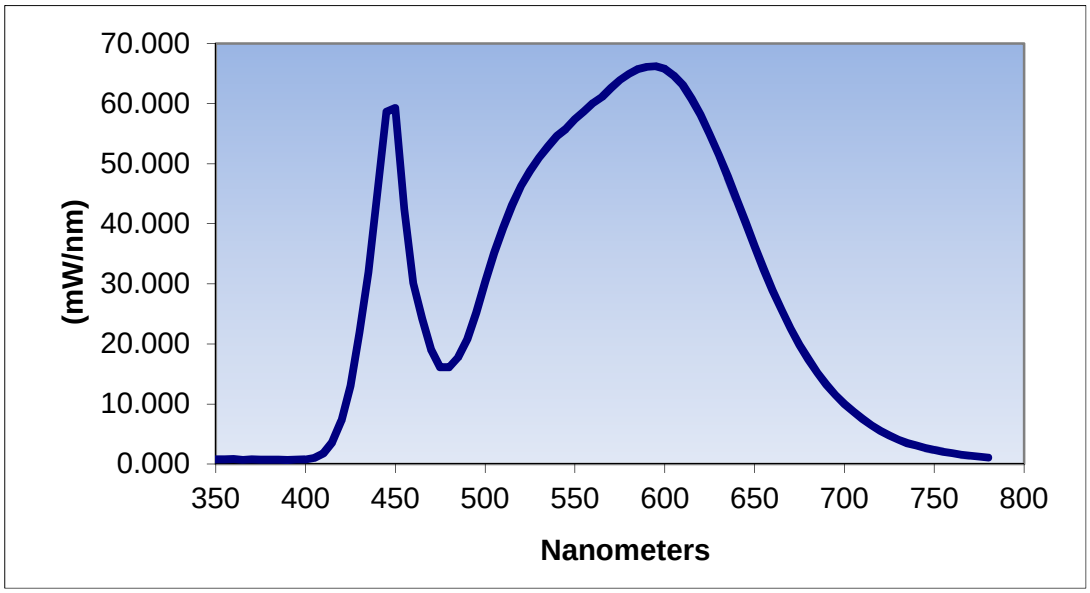


RESULTS

Spectral Distribution Over Visible Wavelengths

nm	mW/nm	nm	mW/nm	nm	mW/nm	nm	mW/nm
350	0.755	460	30.138	570	62.611	680	17.409
355	0.782	465	24.177	575	63.945	685	15.179
360	0.790	470	19.052	580	64.938	690	13.227
365	0.728	475	16.110	585	65.781	695	11.492
370	0.746	480	16.115	590	66.138	700	9.960
375	0.686	485	17.739	595	66.236	705	8.687
380	0.678	490	20.765	600	65.836	710	7.505
385	0.685	495	25.204	605	64.716	715	6.455
390	0.674	500	30.341	610	63.150	720	5.512
395	0.751	505	35.194	615	60.817	725	4.763
400	0.765	510	39.319	620	58.112	730	4.074
405	1.006	515	43.121	625	54.936	735	3.499
410	1.781	520	46.296	630	51.482	740	3.082
415	3.620	525	48.838	635	47.857	745	2.680
420	7.233	530	50.981	640	43.940	750	2.340
425	13.032	535	52.870	645	40.190	755	2.048
430	21.883	540	54.618	650	36.231	760	1.824
435	31.933	545	55.795	655	32.447	765	1.565
440	45.165	550	57.410	660	28.924	770	1.374
445	58.641	555	58.691	665	25.681	775	1.213
450	59.280	560	60.095	670	22.582	780	1.085
455	42.486	565	61.144	675	19.826		

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, 40 Degree Beam Diffuser, All LEDs On
Sphere Raw CSV File - eW ReachElite Powercore, 100W, 4000K, 40 Degree Beam Diffuser, All LEDs On