



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-047

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

MODEL NO. EW REACHELITE POWERCORE, 100W, 4000K, 10 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, 10 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.

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SUMMARY:

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

Criteria	Integrating Sphere	Goniophotometer
Light Output (Lumens)	5411.4	5365.2
Total Power (W)	97.90	97.21
Lumen Efficacy (Lm/W)	55.3	55.2
Power Factor ()	0.988	0.989
Current ATHD (%)	12.69	
Correlated Color Temp. (CCT-K)	3931	
Color Rendering Index (CRI - Ra)	80.6	
CRI - R9	5.6	
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	---	VBV	VBV
Sorenson DC Power Supply	XG 150-10	---	VBV	VBV
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	---	VBV	VBV
Sorenson DC Power Supply	XFR 150-8	---	VBV	VBV
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	120.06	818.8	97.21	0.989	5365.2	55.2

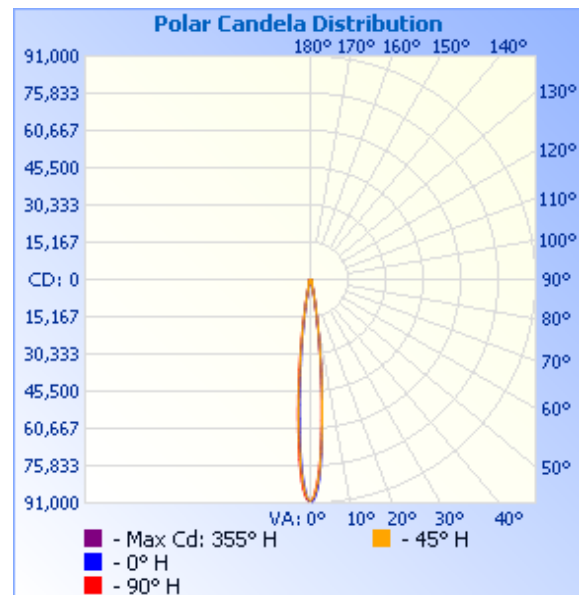
Maximum Cd: 90,688.0 at Horizontal: 355°, Vertical: 0.5°

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

Intensity (Candlepower) Summary at 25°C - Candelas

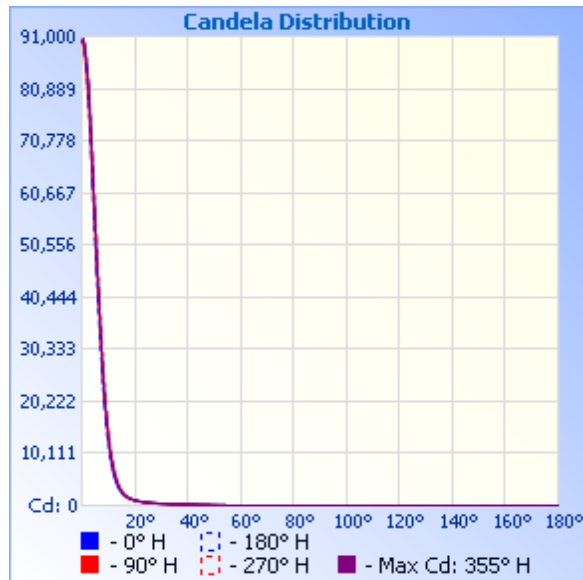
Angle	0	30	45	65	90
0	90005	90005	90005	90005	90005
5	54819	54313	53926	53485	52196
10	13370	13430	13845	13476	12902
15	2779	2829	2816	2777	2675
20	1087	1065	1045	1036	1024
25	623	598	574	561	568
30	429	403	373	355	367
35	320	287	256	236	248
40	246	210	181	164	174
45	183	155	132	115	122
50	132	113	95	80	85
55	91	79	64	50	56
60	57	50	38	28	33
65	29	25	16	10	15
70	6	5	0	0	1
75	0	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

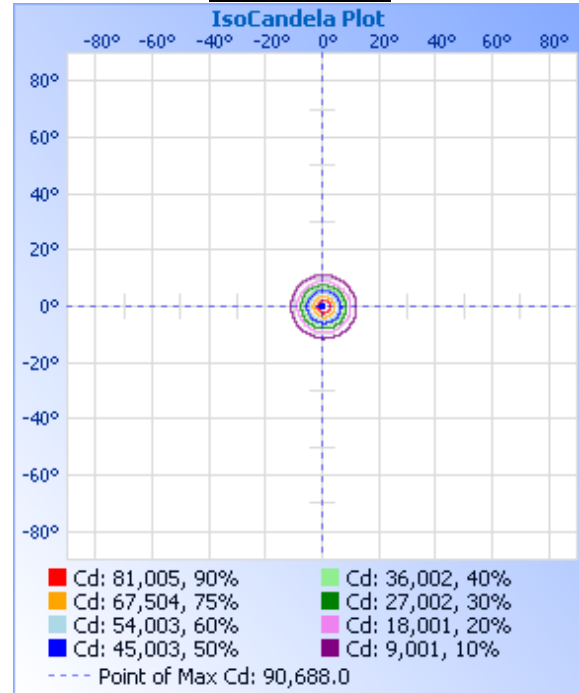


RESULTS:

Cartesian Candela Distribution Plot



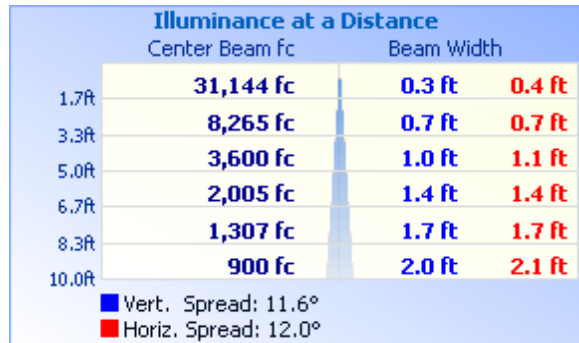
Isocandela Plot



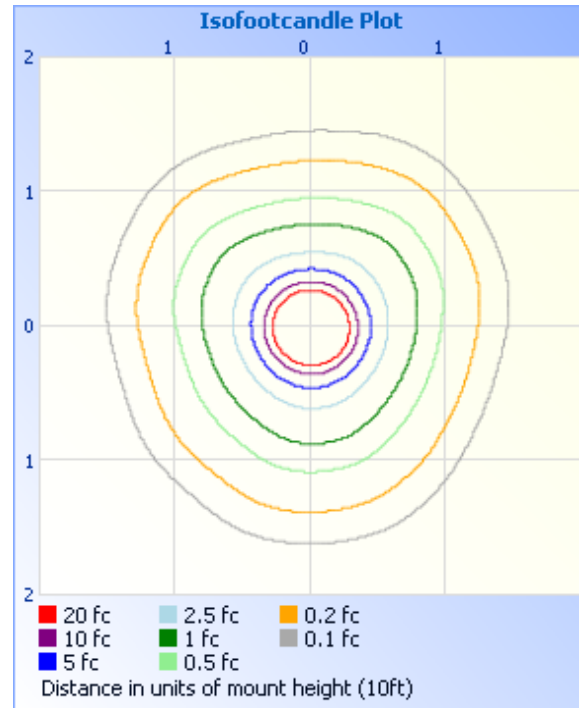
Isoillumination Plots

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	4520	3256	3022
55	2779	1951	1704
65	1186	69	632
75	0	0	0
85	0	0	0

RESULTS:

Zonal Lumen Summary and Percentages at 25°C

Zone	Lumens	% Luminaire
0-30	4995.9	93.1
0-40	5168.7	96.3
0-60	5344.9	99.6
0-90	5365.2	100.0
60-90	20.3	0.4
70-100	0.2	0.0
90-120	0.0	0.0
90-180	0.0	0.0
0-180	5365.2	100.0

Zonal Lumens and Percentages at 25°C

Zone	Lumens	% Luminaire
0-10	3719.7	69.3
10-20	996.3	18.6
20-30	279.9	5.2
30-40	172.8	3.2
40-50	113.3	2.1
50-60	63.0	1.2
60-70	20.1	0.4
70-80	0.2	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 %:	<u>70</u>	<u>50</u>	<u>30</u>	<u>0</u>	<u>70</u>	<u>50</u>	<u>30</u>	<u>0</u>	<u>50</u>	<u>30</u>	<u>20</u>	<u>50</u>	<u>30</u>	<u>20</u>	<u>50</u>	<u>30</u>	<u>20</u>	<u>50</u>	<u>30</u>	<u>20</u>	<u>0</u>
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	1.00	1.00	1.00
1	1.16	1.14	1.12	1.11	1.13	1.12	1.10	.98	1.08	1.07	1.06	1.04	1.03	1.03	1.01	1.00	1.00	.98	.98	.98	.98
2	1.13	1.10	1.07	1.05	1.11	1.08	1.06	.96	1.05	1.03	1.02	1.02	1.01	.99	.99	.98	.97	.96	.96	.96	.96
3	1.10	1.06	1.03	1.01	1.08	1.05	1.02	.95	1.02	1.00	.98	1.00	.98	.97	.98	.97	.95	.94	.94	.94	.94
4	1.07	1.03	1.00	.97	1.06	1.02	.99	.93	1.00	.98	.96	.98	.96	.95	.97	.95	.94	.93	.93	.93	.93
5	1.05	1.00	.97	.95	1.04	1.00	.97	.92	.98	.96	.94	.97	.95	.93	.95	.94	.92	.91	.91	.91	.91
6	1.03	.98	.95	.93	1.02	.98	.95	.90	.96	.94	.92	.95	.93	.91	.94	.92	.91	.90	.90	.90	.90
7	1.01	.96	.93	.91	1.00	.96	.93	.89	.95	.92	.90	.94	.91	.90	.93	.91	.89	.89	.89	.89	.89
8	1.00	.95	.91	.89	.99	.94	.91	.88	.93	.91	.89	.93	.90	.88	.92	.90	.88	.87	.87	.87	.87
9	.98	.93	.90	.88	.98	.93	.90	.87	.92	.89	.88	.91	.89	.87	.91	.89	.87	.86	.86	.86	.86
10	.97	.92	.89	.87	.96	.92	.89	.86	.91	.88	.87	.90	.88	.86	.90	.88	.86	.85	.85	.85	.85

Flood Summary

Flood Summary

	Efficiency	Lumens	Horizontal Spread	Vertical Spread
Field (10%):	75.4%	4,043.0	23.1	22.5
Beam (50%):	35.9%	1,924.3	12	11.6
Total:	101.3%	5,433.2		

RESULTS:

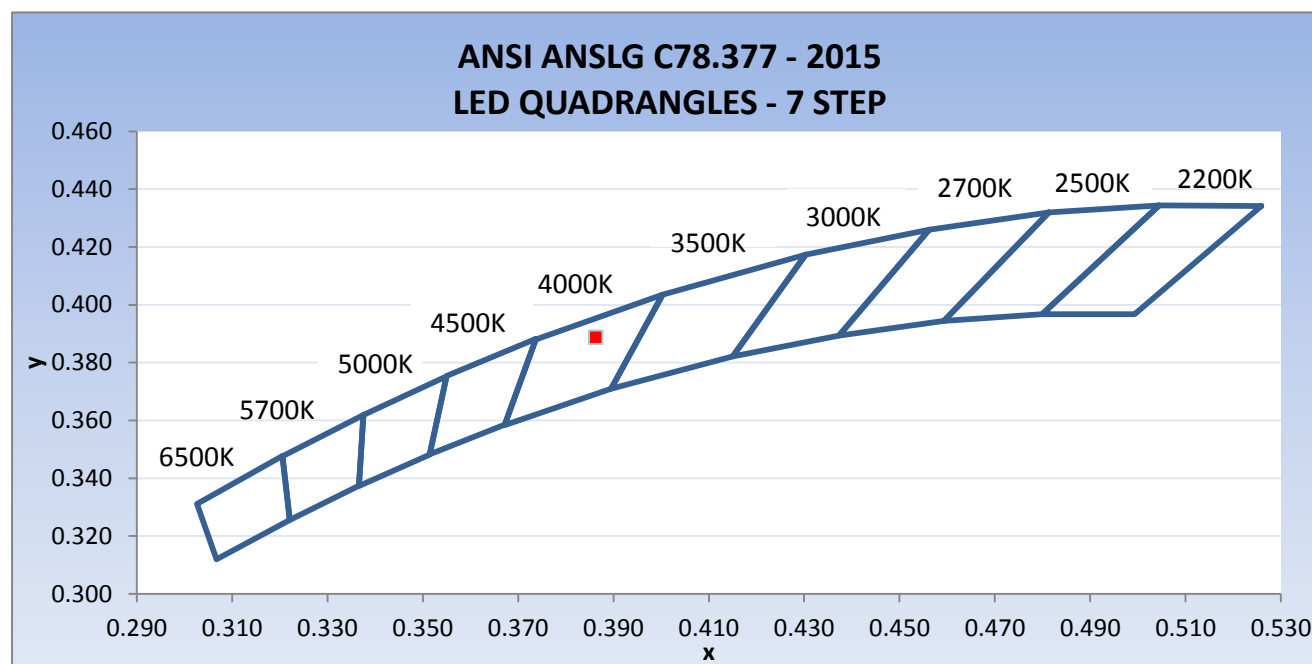
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Intertek Control No.	Base Orientation	Input Voltage (VAC)	Input Current (mA)	Input Power (W)	Input Power Factor ()	Current ATHD (%)
CRT1705221531-002	Base Up	120.04	825.3	97.90	0.988	12.69

Light Output (Lumens)	Lumen Efficacy (lm/W)	Correlated Color Temperature - CCT (K)	CRI -Ra	CRI -R9	DUV ()
5411.4	55.3	3931	80.6	5.6	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)

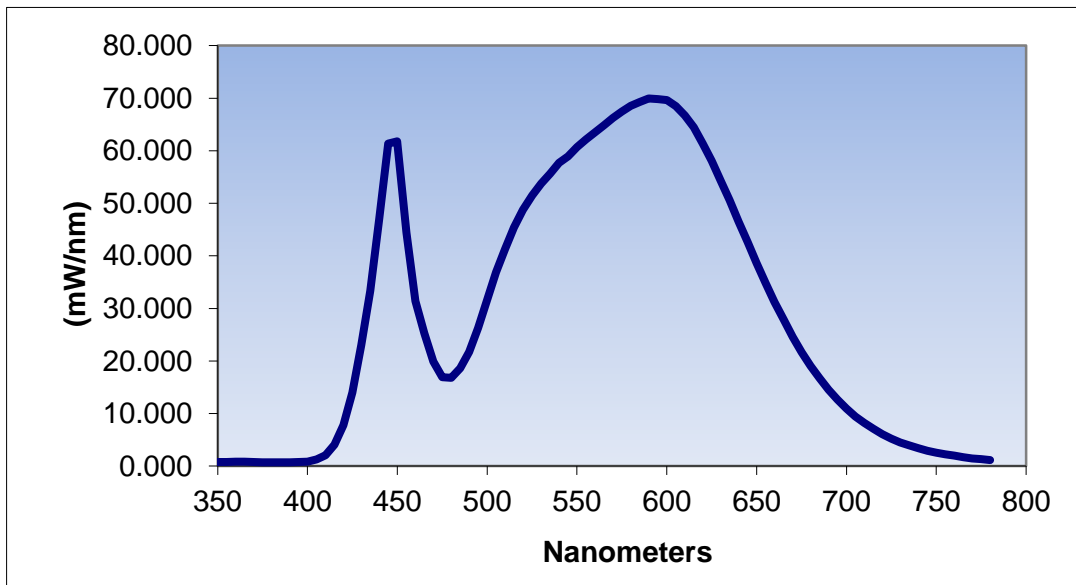


RESULTS

Spectral Distribution Over Visible Wavelengths

nm	mW/nm	nm	mW/nm	nm	mW/nm	nm	mW/nm
350	0.752	460	31.389	570	66.201	680	19.046
355	0.744	465	25.221	575	67.469	685	16.739
360	0.825	470	19.908	580	68.554	690	14.513
365	0.826	475	16.881	585	69.274	695	12.651
370	0.786	480	16.795	590	69.925	700	10.968
375	0.726	485	18.600	595	69.803	705	9.417
380	0.682	490	21.710	600	69.668	710	8.208
385	0.731	495	26.313	605	68.495	715	7.081
390	0.739	500	31.608	610	66.743	720	6.052
395	0.784	505	36.863	615	64.474	725	5.242
400	0.840	510	41.240	620	61.349	730	4.480
405	1.239	515	45.432	625	58.042	735	3.921
410	2.077	520	48.780	630	54.287	740	3.365
415	4.075	525	51.467	635	50.564	745	2.932
420	7.797	530	53.738	640	46.502	750	2.556
425	14.010	535	55.617	645	42.658	755	2.232
430	23.045	540	57.719	650	38.660	760	1.966
435	33.354	545	58.894	655	34.872	765	1.687
440	47.070	550	60.695	660	31.208	770	1.471
445	61.377	555	62.169	665	27.900	775	1.297
450	61.801	560	63.481	670	24.575	780	1.132
455	44.402	565	64.800	675	21.652		

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
Project Engineer
Lighting Division

Report Reviewed By:



Jeffrey Davis
Engineering Supervisor
Lighting Division

Attachments:

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