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-045

TEST OF ONE FLOOD FIXTURE WITH 36 LEDS, 4000K, CLEAR LENS.
SAMPLE #5

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

Note: Gonio testing was conducted on a Type A Goniometer and not tested to LM-79 requirements.

DESCRIPTION OF SAMPLE: The client submitted one production sample of model number eW ReachElite Powercore, 100W, 4000K, No 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 7, 2017 through June 15, 2017.

SUMMARY:

MODEL NO. eW ReachElite Powercore, 100W, 4000K, No Diffuser, All LEDs On
DESCRIPTION: Flood Fixture with 36 LEDs, 4000K, Clear Lens. Sample #5

Criteria	Integrating Sphere	Goniophotometer
Light Output (Lumens)	5969.5	5900.3
Total Power (W)	97.90	97.85
Lumen Efficacy (Lm/W)	61.0	60.3
Power Factor ( )	0.988	0.989
Current ATHD (%)	12.69	
Correlated Color Temp. (CCT-K)	3923	
Color Rendering Index (CRI - Ra)	80.2	
CRI - R9	3.7	
DUV ( )	0.004	
Chromaticity Coordinate (x)	0.387	
Chromaticity Coordinate (y)	0.389	
Chromaticity Coordinate (u')	0.224	
Chromaticity Coordinate (v')	0.508	

Criteria	Luminaire Only
Voltage (VAC)	119.3
Current (mA)	841.2
Power (W)	99.35
Power Factor ( )	0.990
Lumen Efficacy (Lm/W)	60.1

EQUIPMENT LIST

Equipment Used	Model No.	Control No.	Last Cal.	Cal. Due
Goniometer	O109	snt 10	10/3/2017	10/3/2018
25M Photometer	sms 10	O115	10/24/2017	10/24/2018
Hygro-Thermometer	445715	T1555	5/16/2017	5/16/2018
Level	No 98	L142	7/20/2016	7/20/2017
Power Analyzer	WT230	U094	4/25/2017	4/25/2018
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
Elgar AC Power Supply	CW1251	---	VBU	VBU
Yokogawa Power Analyzer	WT1600	E474	5/4/2017	5/4/2018

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 Type A 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, but this Type A method is not approved per LM-79. Electrical measurements including voltage, current, and power were measured using a power analyzer.

Electrical measurements – Luminaire Only Benchtop Testing
The SSL sample was operated on the client provided driver at rated input volts in its designated orientation. The SSL sample was stabilized before measurements were made. 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

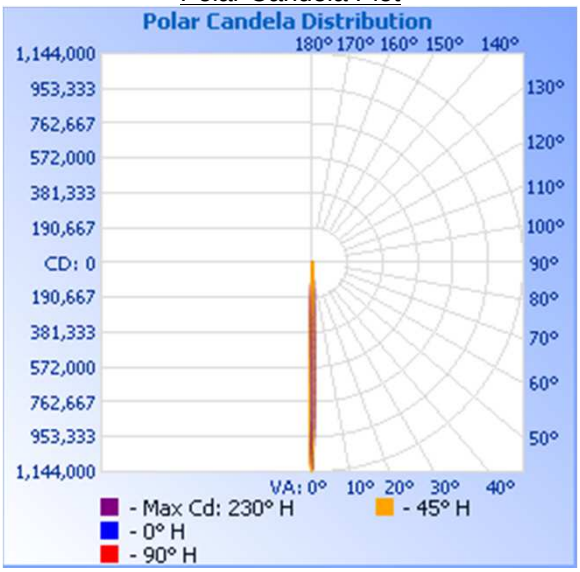
Intertek Control No.	Base Orientation	Input Voltage (VAC)	Input Current (mA)	Input Power (W)	Input Power Factor ( )	Light Output (Lumens)	Lumen Efficacy (lm/W)
CRT1705221531-002	Base Up	120.20	823.6	97.85	0.989	5900.3	60.3

Maximum Cd: 1,143,700.0 at Horizontal: 230°, Vertical: 0.2° Luminous Opening: (L: 18.5", W: 4.75")

Intensity (Candlepower) Summary at 25°C - Candelas

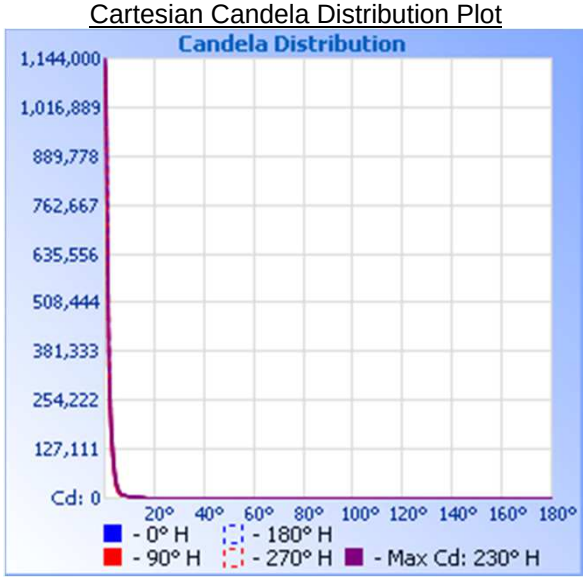
Angle	0	30	45	65	90
0	1105226	1105226	1105226	1105226	1105226
5	22551	20719	20111	19868	20656
10	4009	3883	3813	3787	3834
15	1617	1543	1511	1511	1571
20	834	838	825	792	787
25	543	552	549	517	504
30	396	423	429	376	354
35	284	294	304	264	247
40	222	382	299	207	199
45	174	187	200	170	161
50	150	165	180	127	119
55	142	168	167	109	102
60	82	87	89	82	76
65	60	64	67	60	58
70	40	41	41	41	37
75	24	25	22	22	19
80	10	10	10	8	5
85	2	2	2	1	0
90	0	0	0	0	0

Polar Candela Plot

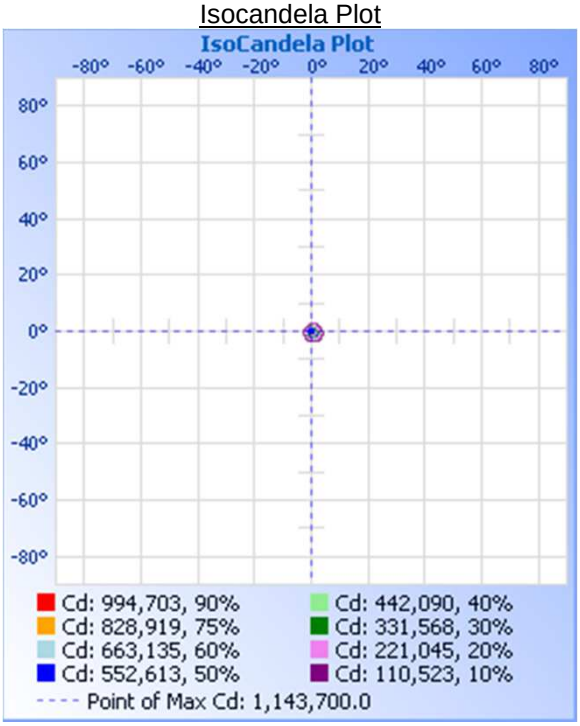


RESULTS:

Cartesian Candela Distribution Plot



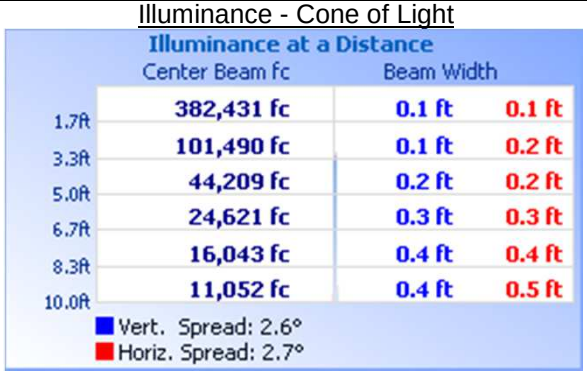
Isocandela Plot



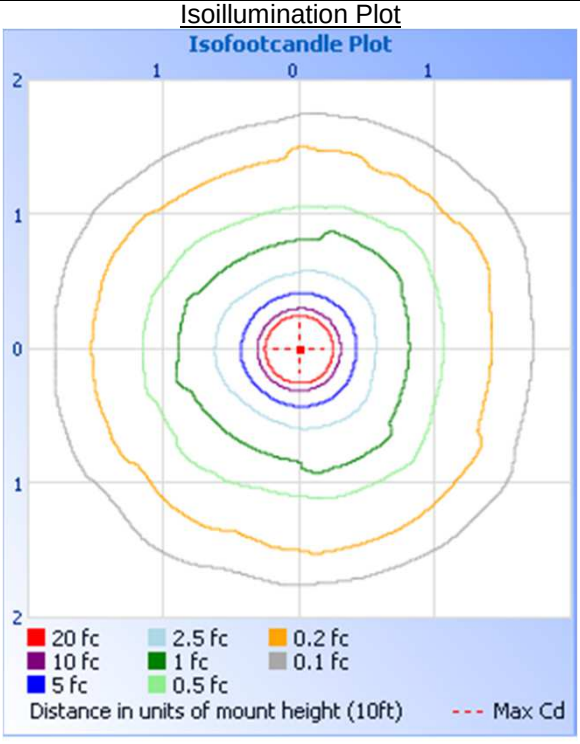
Isoillumination Plots

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	4486	4821	4033
55	4748	5597	3168
65	2543	2756	2432
75	1611	1528	1264
85	305	360	101

RESULTS:

Zonal Lumen Summary and Percentages at 25°C

Zone	Lumens	% Luminaire
0-30	5355.6	90.8
0-40	5544.5	94.0
0-60	5808.3	98.4
0-90	5900.3	100.0
60-90	92.0	1.6
70-100	28.2	0.5
90-120	0.0	0.0
90-180	0.0	0.0
0-180	5900.3	100.0

Zonal Lumens and Percentages at 25°C

Zone	Lumens	% Luminaire
0-10	4586.8	77.7
10-20	510.5	8.7
20-30	258.2	4.4
30-40	189.0	3.2
40-50	150.0	2.5
50-60	113.8	1.9
60-70	63.8	1.1
70-80	25.3	0.4
80-90	2.9	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	1.16	1.14	1.12	1.11	1.13	1.12	1.10	.98	1.08	1.07	1.06	1.04	1.03	1.02	1.01	1.00	.99	.98
2	1.13	1.09	1.07	1.05	1.11	1.08	1.05	.96	1.05	1.03	1.01	1.02	1.00	.99	.99	.98	.97	.96
3	1.10	1.06	1.03	1.00	1.08	1.05	1.02	.95	1.02	1.00	.98	1.00	.98	.97	.98	.96	.95	.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	.92
5	1.05	1.01	.97	.95	1.04	1.00	.97	.92	.98	.96	.94	.97	.95	.93	.95	.94	.92	.91
6	1.03	.99	.95	.93	1.02	.98	.95	.91	.97	.94	.92	.96	.93	.92	.94	.92	.91	.90
7	1.02	.97	.94	.91	1.01	.96	.93	.90	.95	.93	.91	.94	.92	.90	.93	.91	.90	.89
8	1.00	.95	.92	.90	1.00	.95	.92	.89	.94	.92	.90	.93	.91	.89	.93	.91	.89	.88
9	.99	.94	.91	.89	.98	.94	.91	.88	.93	.91	.89	.92	.90	.88	.92	.90	.88	.88
10	.98	.93	.90	.88	.97	.93	.90	.87	.92	.90	.88	.92	.89	.88	.91	.89	.88	.87

Flood Summary

Flood Summary

	Efficiency	Lumens	Horizontal Spread	Vertical Spread
Field (10%):	52.3%	3,087.3	6.6	6.5
Beam (50%):	15.5%	916.6	2.7	2.6
Total:	100.7%	5,941.9		

RESULTS:

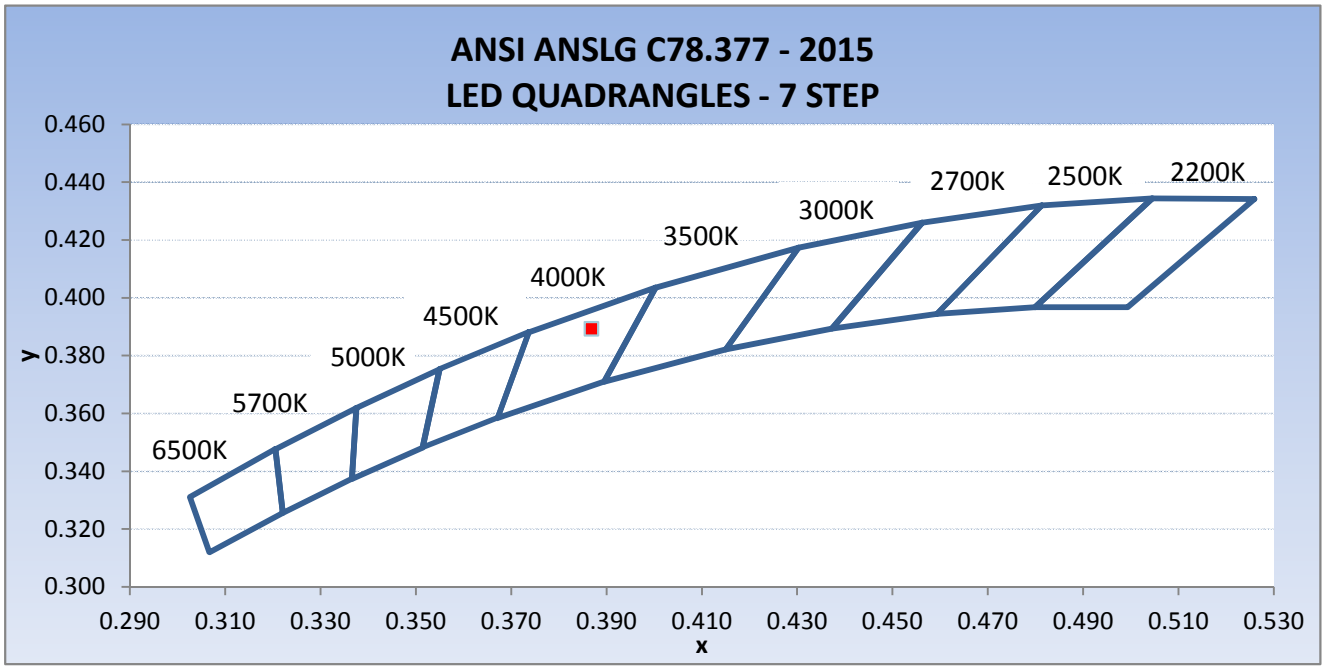
Photometric and Electrical Measurements at Ambient Temperature (25°C +/- 1°C) – Integrating Sphere Method

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 ( )
5969.5	61.0	3923	80.2	3.7	0.004

CIE 31' Chromaticity Coordinate (x)	CIE 31' Chromaticity Coordinate (y)	CIE 76' Chromaticity Coordinate (u')	CIE 76' Chromaticity Coordinate (v')
0.387	0.389	0.224	0.508

ANSI C78.377 SSL Chromaticity (2015 Version)



Electrical Output Measurements at Ambient Temperature (25°C +/- 1°C) – Luminaire Only Benchtop Testing

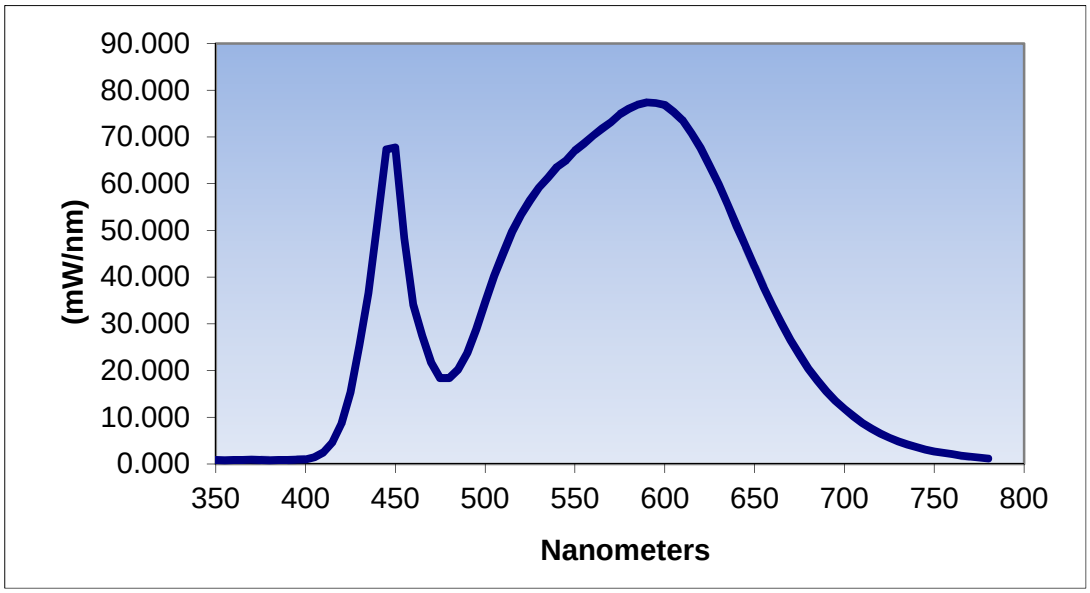
Intertek Control No.	Base Orientation	Luminaire Voltage (VAC)	Luminaire Current (mA)	Luminaire Power (W)	Luminaire Power Factor ( )	Luminaire Efficacy (lm/W)
CRT1705221531-002	Base Up	119.34	841.2	99.35	0.990	60.1

RESULTS

Spectral Distribution Over Visible Wavelengths

nm	mW/nm	nm	mW/nm	nm	mW/nm	nm	mW/nm
350	0.844	460	34.108	570	73.196	680	20.445
355	0.744	465	27.485	575	74.875	685	17.882
360	0.864	470	21.717	580	76.042	690	15.590
365	0.853	475	18.400	585	76.929	695	13.534
370	0.882	480	18.339	590	77.428	700	11.761
375	0.829	485	20.244	595	77.314	705	10.189
380	0.753	490	23.812	600	76.885	710	8.784
385	0.815	495	28.859	605	75.396	715	7.570
390	0.812	500	34.647	610	73.580	720	6.496
395	0.888	505	40.315	615	70.780	725	5.611
400	1.006	510	45.080	620	67.624	730	4.805
405	1.452	515	49.741	625	63.851	735	4.179
410	2.456	520	53.389	630	59.782	740	3.613
415	4.632	525	56.470	635	55.517	745	3.125
420	8.736	530	59.192	640	50.923	750	2.719
425	15.361	535	61.229	645	46.570	755	2.399
430	25.499	540	63.576	650	42.193	760	2.105
435	36.612	545	64.960	655	37.860	765	1.815
440	51.766	550	67.047	660	33.849	770	1.558
445	67.380	555	68.581	665	30.109	775	1.370
450	67.764	560	70.301	670	26.532	780	1.188
455	48.376	565	71.793	675	23.397		

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, No Diffuser, All LEDs On
Sphere Raw CSV File - eW ReachElite Powercore, 100W, 4000K, No Diffuser, All LEDs On