



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

# REPORT

3933 US ROUTE 11 CORTLAND, NEW YORK 13045

Project No. G100227727

Date: February 3, 2011

REPORT NO. 100227727CRT-001A

TEST OF ONE MODEL OF LED PAR38 LAMPS

MODEL NO. AE26PAR38182760

RENDERED TO

NEXXUS LIGHTING INC.  
124 FLOYD SMITH DRIVE  
SUITE 300  
CHARLOTTE, NC 28262

TEST: Electrical and Photometric tests as required to the IESNA test standard.

LABORATORY NOTE: The laboratory that conducted the testing detailed in this report has been Qualified, Verified, and Recognized for LM-79 Testing for ENERGY STAR for SSL by US DOE's CALiPER program.

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 500259565.

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 Approved Method for Electrical and Photometric Measurements of Solid-State Lighting Products

ANSI NEMA ANSLG C78.377: 2008 Specifications of the Chromaticity of Solid State Lighting Products

DESCRIPTION OF SAMPLE: The client submitted 30 samples of model number AE26PAR38182760. The samples were received by Intertek on November 4, 2011, in undamaged condition, and ten samples were tested as received. The sample designations are N9027L through N9036L.

DATES OF TESTS: December 20, 2010 through January 26, 2011.

SUMMARY

Model No.: AE26PAR38182760
Description: PAR38

Criteria	Result
Total Lumen Output	783.6 Lumens
Total Power	17.09 W
Luminaire Efficacy	45.88
Power Factor	0.968
Current ATHD	20.77 %
Correlated Color Temperature (CCT)	2675 K
Color Rendering Index (CRI)	83.9
Chromaticity Coordinate (x)	0.462
Chromaticity Coordinate (y)	0.411
Chromaticity Coordinate (u')	0.264
Chromaticity Coordinate (v')	0.528
Color Spatial Uniformity	max $\Delta$ = 0.003

EQUIPMENT LIST

Equipment Used	Model Number	Control Number	Last Calibration Date	Calibration Due Date
Xitron Power Analyzer	2503H	E235	04/09/10	04/09/11
Elgar AC Power Supply	CW1251	--	--	--
Yokogawa Power Analyzer	WT1600	E462	06/11/10	06/11/11
Labsphere Diode Array	DAS 1100	N714	Before Use	Before Use
Leeds & Northup Standard Resistor	Manganin	Y089	02/10/10	02/10/11
Data Precision Digital Voltmeter	3600	V124	02/10/10	02/10/11
Fluke Multimeter	45	M133	02/10/10	02/10/11
Fluke Temperature Meter	52	T801	06/11/10	06/11/11
Kikusui DC Power Supply	35-10L	E160	---	---
Sorenson DC Power Supply	DLM150-20E	--	---	---
UDT Optometer	S370	N301	Before Use	Before Use
ITS Two Meter Diameter Integrating Sphere	---	N308	Before Use	Before Use
ITS Ten Foot Diameter Integrating Sphere	---	N307	Before Use	Before Use
NIST Luminous Flux Standard Sources	---	150-14, 8043, 8830	03/17/10	03/17/11
NIST Spectral Flux Standard Source	RF1024	---	09/18/10	100 hours of use
LSI High Speed Mirror Goniophotometer	6440	--	Before Use	Before Use
Labsphere CDS 1100 CCD Spectroradiometer	CDS1100	--	Before Use	Before Use
Optronics Spectroradiometer	EL750D	E288	Before Use	Before Use

## TEST METHODS

### Seasoning in Sample Orientation – LED Products

No seasoning was performed in accordance with IESNA LM-79.

### 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 Xitron or Yokogawa Power Analyzer.

Some graphics were created with Photometrics Plus software.

### Photometric and Electrical Measurements – Integrating Sphere Method

A Labsphere Model DAS 1100 Diode 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. Electrical measurements including voltage, current, and power were measured using the Xitron or Yokogawa Power Analyzer.

The calibration of the sphere photometer-spectroradiometer system is traceable to the National Institute of Standards and Technology.

### Color Spatial Uniformity

The spatial distribution of chromaticity coordinates ( $u'$   $v'$ ) were measured within two vertical planes (CIE),  $0^\circ$  and  $90^\circ$  in vertical  $10^\circ$  increments until the light output dropped to below 10% of the maximum light output. The averaged weighted chromaticity coordinate was calculated from these points. The data was then analyzed to check for delta color differences of the  $u'$ ,  $v'$  chromaticity coordinates.

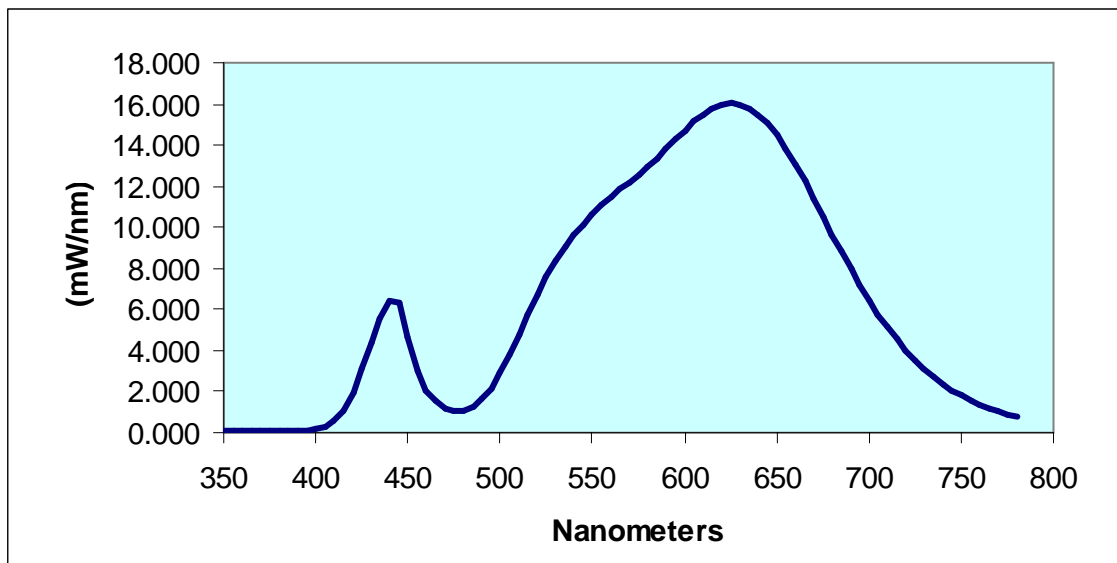


**RESULTS OF TESTS**

Spectral Distribution over Visible Wavelengths

nm	mW/nm	nm	mW/nm	nm	mW/nm	nm	mW/nm
AE26PAR38182760							
350	0.093	460	2.081	570	12.152	680	9.670
355	0.109	465	1.538	575	12.516	685	8.809
360	0.085	470	1.208	580	12.908	690	8.016
365	0.061	475	1.085	585	13.330	695	7.242
370	0.067	480	1.111	590	13.816	700	6.469
375	0.077	485	1.291	595	14.305	705	5.774
380	0.067	490	1.642	600	14.672	710	5.119
385	0.084	495	2.187	605	15.132	715	4.541
390	0.100	500	2.933	610	15.426	720	3.984
395	0.133	505	3.821	615	15.751	725	3.518
400	0.176	510	4.785	620	16.000	730	3.096
405	0.312	515	5.777	625	16.024	735	2.709
410	0.575	520	6.713	630	15.987	740	2.353
415	1.109	525	7.564	635	15.763	745	2.074
420	1.976	530	8.320	640	15.467	750	1.803
425	3.152	535	9.005	645	15.034	755	1.574
430	4.403	540	9.584	650	14.537	760	1.367
435	5.526	545	10.138	655	13.863	765	1.191
440	6.403	550	10.630	660	13.067	770	1.036
445	6.372	555	11.080	665	12.295	775	0.905
450	4.701	560	11.436	670	11.407	780	0.788
455	3.007	565	11.834	675	10.502		

**SHARP**  
**Sample No. N9036L**  
**Model No. AE26PAR38182760**  
**Spectral Data Over Visible Wavelengths**



RESULTS OF TESTS (cont'd)

Photometric and Electrical Measurements at 25°C – Integrating Sphere Method

Intertek Sample No.	Base Orientation	Input Voltage (Vac)	Input Current (ma)	Input Power (W)	Input Power Factor	Current ATHD (%)	Luminous Flux (Lumens)	Lumen Efficacy (Lumens per Watt)
AE26PAR38182760								
N9031L	Up	120.0	146.6	17.08	0.971	20.98	798.5	46.75
N9032L	Up	120.0	145.8	16.97	0.970	19.60	794.7	46.83
N9033L	Up	120.0	146.7	17.06	0.969	21.26	794.3	46.56
N9034L	Up	120.0	145.6	16.90	0.968	20.77	803.4	47.54
N9035L	Up	120.0	144.7	16.85	0.970	19.42	795.6	47.22
Average	Up	120.0	145.9	16.97	0.969	20.41	797.3	46.98
N9036L	Down	120.0	143.1	16.66	0.970	20.00	799.6	48.00
N9027L	Down	120.0	148.4	17.23	0.968	20.48	764.8	44.38
N9028L	Down	120.0	148.3	17.18	0.965	22.02	764.0	44.47
N9029L	Down	120.0	151.4	17.55	0.966	21.68	754.1	42.97
N9030L	Down	120.0	150.1	17.38	0.965	21.44	766.7	44.11
Average	Down	120.0	148.3	17.20	0.967	21.12	769.8	44.79
Average	All	120.0	147.1	17.09	0.968	20.77	783.6	45.88

Intertek Sample No.	Base Position	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')
AE26PAR38182760									
N9031L	Up	2701	83.8	44.3	0.0002	0.460	0.411	0.262	0.528
N9032L	Up	2680	84.0	46.0	0.0000	0.462	0.412	0.263	0.528
N9033L	Up	2632	84.0	45.7	0.0006	0.467	0.414	0.265	0.530
N9034L	Up	2707	83.7	43.7	0.0002	0.460	0.411	0.262	0.527
N9035L	Up	2688	83.6	45.4	0.0005	0.461	0.411	0.263	0.527
Average	Up	2681	83.8	45.0	0.0003	0.462	0.412	0.263	0.528
N9036L	Down	2701	83.4	44.7	0.0008	0.459	0.409	0.263	0.527
N9027L	Down	2708	83.9	43.5	0.0009	0.458	0.409	0.262	0.526
N9028L	Down	2613	84.4	43.0	0.0006	0.468	0.414	0.266	0.530
N9029L	Down	2658	84.3	44.3	0.0005	0.462	0.410	0.265	0.527
N9030L	Down	2660	83.6	42.7	0.0005	0.462	0.410	0.264	0.527
Average	Down	2668	83.9	43.6	0.0007	0.462	0.410	0.264	0.528
Average	All	2675	83.9	44.3	0.0005	0.462	0.411	0.264	0.528

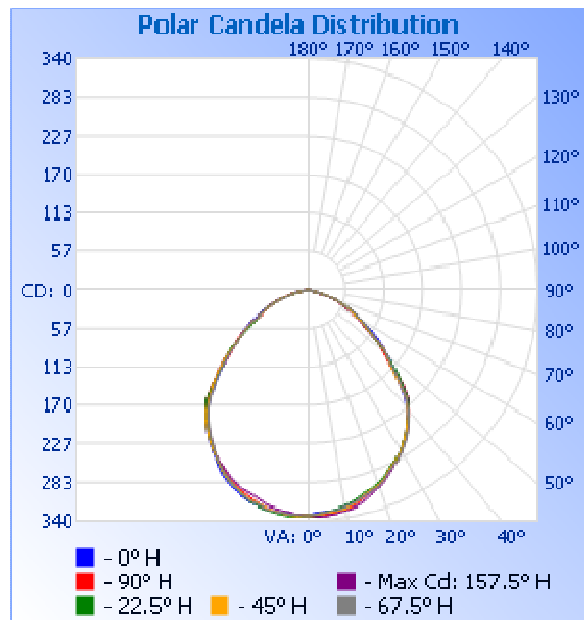
**RESULTS OF TESTS** (cont'd)

**Photometric and Electrical Measurements – 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)
<b>AE26PAR38182760</b>							
N9031L	UP	120.0	144.8	17.01	0.979	768.0	45.15

**Intensity (Candlepower) Summary at 25°C - Candelas**

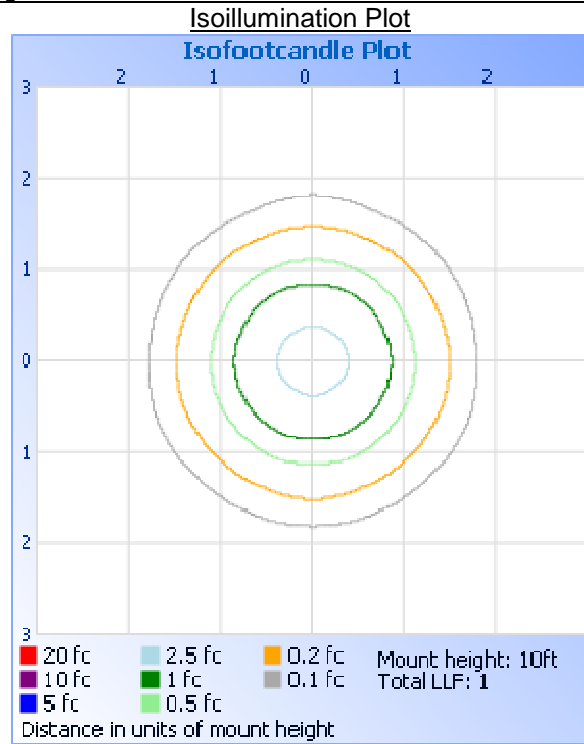
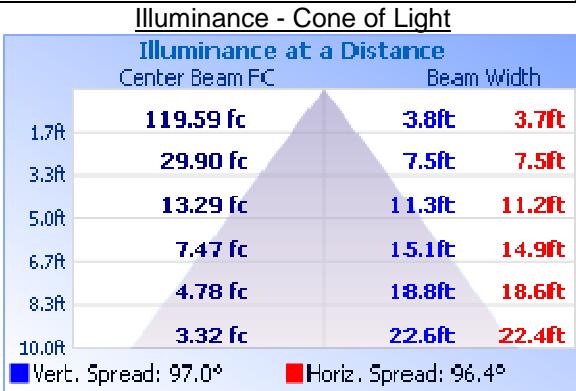
Angle	0	22.5	45	67.5	90
<b>AE26PAR38182760</b>					
0	332	332	332	332	332
5	327	328	330	328	332
10	323	323	326	324	327
15	315	312	315	316	317
20	306	303	305	307	306
25	290	289	290	292	291
30	275	274	275	277	275
35	253	253	253	256	254
40	229	231	229	231	232
45	190	197	189	194	200
50	160	160	156	156	149
55	128	120	120	122	124
60	92	92	90	96	90
65	68	69	68	72	65
70	48	47	47	48	44
75	23	26	25	26	24
80	8	10	10	11	8
85	1	1	1	1	1
90	0	0	0	0	0



## RESULTS OF TESTS (cont'd)

### Illumination Plots

Model No.: AE26PAR38182760  
Mounting Height: 10 ft.



### Zonal Lumen Summary and Percentages at 25°C

Zone	Lumens	% Luminaire
AE26PAR38182760		
0-30	255.6	33.3
0-40	414.2	53.9
0-60	672.1	87.5
60-90	95.9	12.5
0-90	768.0	100.0
90-180	0.0	0.0
0-180	768.0	100.0

### Reflector Summary

	Efficiency (%)	Lumens	Horizontal Spread (°)	Vertical Spread (°)
AE26PAR38182760				
Field (10%):	97.7	750.2	145.3	144.9
Beam (50%):	70.7	542.9	96.4	97.0
Total:	100.0	767.9		

RESULTS OF TESTS (cont'd)

Color Spatial Uniformity

Sample No: N9031L

Model No.: AE26PAR38182760

Vertical Angle (°)	Horizontal Angle = 0°			Horizontal Angle = 90°		
	Candlepower (cd)	CIE' 1976 Chromaticity u'	CIE' 1976 Chromaticity v'	Candlepower (cd)	CIE' 1976 Chromaticity u'	CIE' 1976 Chromaticity v'
0	332	0.2591	0.5181	332	0.2613	0.5184
10	327	0.2596	0.5186	323	0.2613	0.5185
20	306	0.2603	0.5195	306	0.2615	0.5192
30	275	0.2609	0.5206	275	0.2618	0.5202
40	232	0.2618	0.5219	229	0.2623	0.5216
50	149	0.2627	0.5232	160	0.2628	0.5228
60	90	0.2633	0.5237	92	0.2641	0.5244
70	44	0.2630	0.5222	48	0.2644	0.5244

Weighted Average

u'	v'
0.2620	0.5214

Vertical Angle (°)	Horz. 0 Δu'	Horiz. 0 Δv'	Horz. 90 Δu'	Horiz. 90 Δv'
0	-0.0029	-0.0033	-0.0007	-0.0030
10	-0.0024	-0.0028	-0.0007	-0.0029
20	-0.0017	-0.0019	-0.0005	-0.0022
30	-0.0011	-0.0008	-0.0002	-0.0012
40	-0.0002	0.0005	0.0003	0.0002
50	0.0007	0.0018	0.0008	0.0014
60	0.0013	0.0023	0.0021	0.0030
70	0.0010	0.0008	0.0024	0.0030

Pictures (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:

Handwritten signature of Steven Mosier in black ink.

Steven Mosier  
Technician I  
Lighting Division

Attachment: None

Report Reviewed By:

Handwritten signature of Jacki Swiernik in black ink.

Jacki Swiernik  
Project Engineer  
Lighting Division