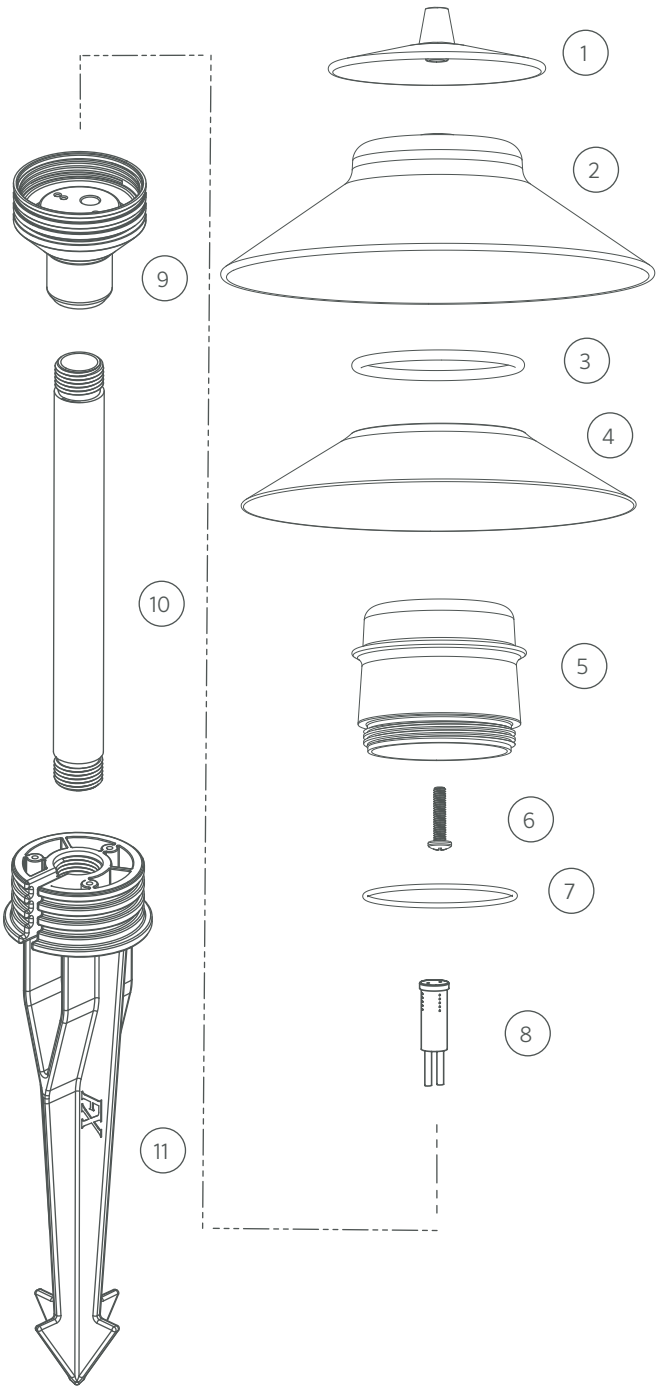
Replacement Parts

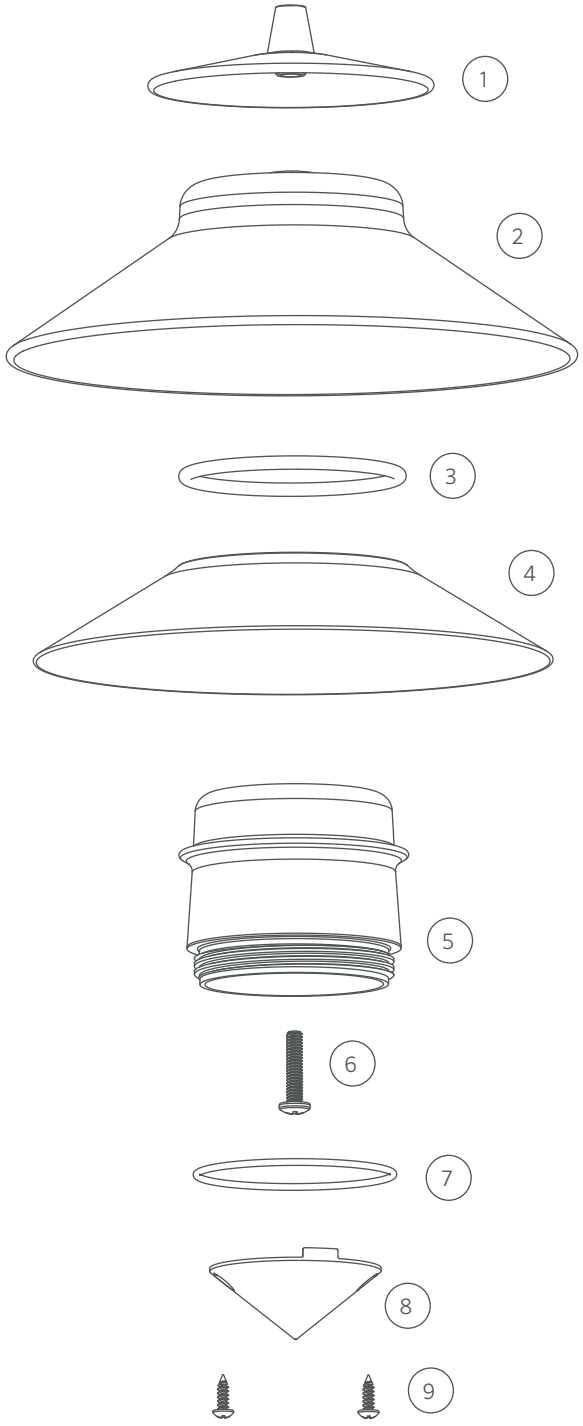
ITEM	DESCRIPTION	CATALOG #
1	Shade	-
2	Top	-
3	O-Ring	250010280011
4	Reflector, White	250018830000
5	Lens	753501
6	Screw, #8-32 x ¾"	250018780000
7	O-Ring	250010280032
8	Socket, G4	754601
9	Reducer	-
10	Riser, Aluminum	YYRXX*
11	Long Slot Spike (LSS)	250015840000
1-7	PL Top Assembly, G4	PLTAXX

** YY = Riser height in inches, XX = Powder coat color code*



Top Assembly Replacement Parts

ITEM	DESCRIPTION	CATALOG #
1	Shade	–
2	Top	–
3	O-Ring	250010280011
4	Reflector, White	250018830000
5	Lens	753500
6	Screw, #8-32 x ¾"	250018780000
7	O-Ring	250010280032
8	Reflector, Chrome	–
9	Screw, #4 x ⅜"	–
8-9	Grande Cone Kit	GCONEKIT



RISERS | A-RISER

Replacement Parts

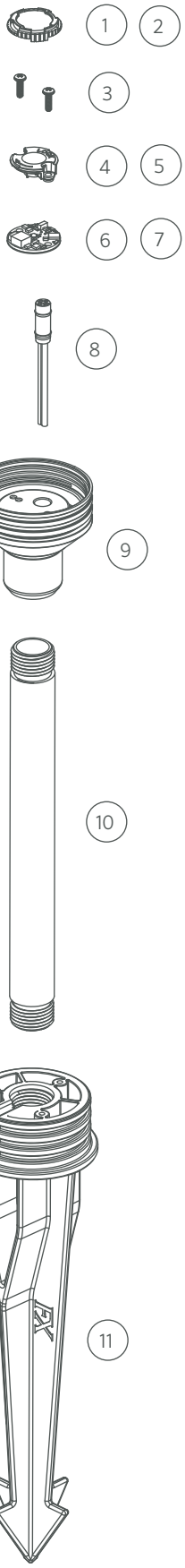
ITEM	DESCRIPTION	CATALOG #
1-2	Color Filter	See LED Chart
3	Screw	See LED Chart
4-5	Reflector	See LED Chart
6-7	LED Board	See LED Chart
8	Socket, 3-meter	752601
9	Reducer	–
10	Riser, Aluminum	YYRXX*
11	Long Slot Spike (LSS)	250015840000

** YY = Riser height in inches, XX = Powder coat color code*

A-RA Lamp Replacement

ITEM	DESCRIPTION	CATALOG #
1	1 LED Color Filter, Amber	770100
1	1 LED Color Filter, Blue	770101
1	1 LED Color Filter, Green	770102
2	3 LED Color Filter, Amber	770800
2	3 LED Color Filter, Blue	770801
2	3 LED Color Filter, Green	770802
3	Screw, #4-40 x ⅜" (Qty Req: 2)	762400
4	1 LED Reflector	770000
5	3 LED Reflector	770700
5	ZDC LED Reflector	250022050000
6	1 LED Board	1LEDULKIT‡
7	3 LED Board	3LEDULKIT‡
7	ZDC LED Board	ZDCKITM**

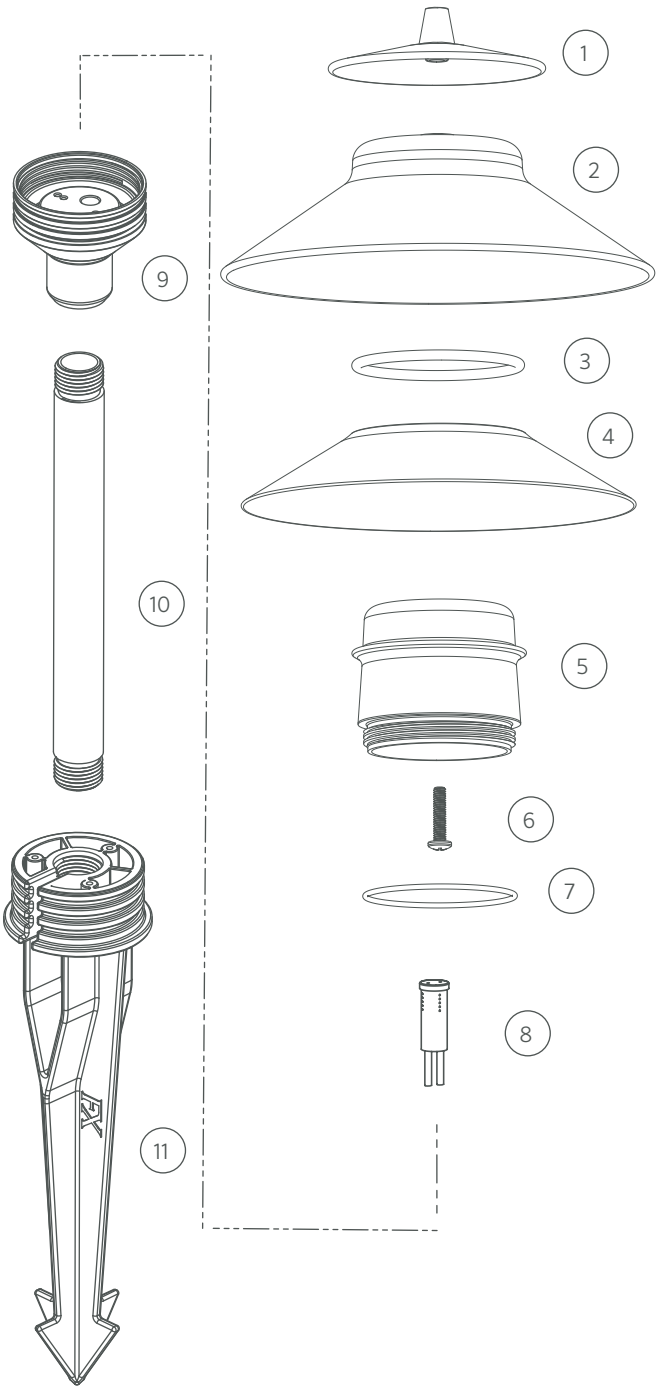
‡ ZD = Zoneable and dimmable (add ZD to front of part number)
*** ZDC kit includes LED board, ZDC reflector, screws, and flood lens diffuser (3LEDFLLENS)*



Replacement Parts

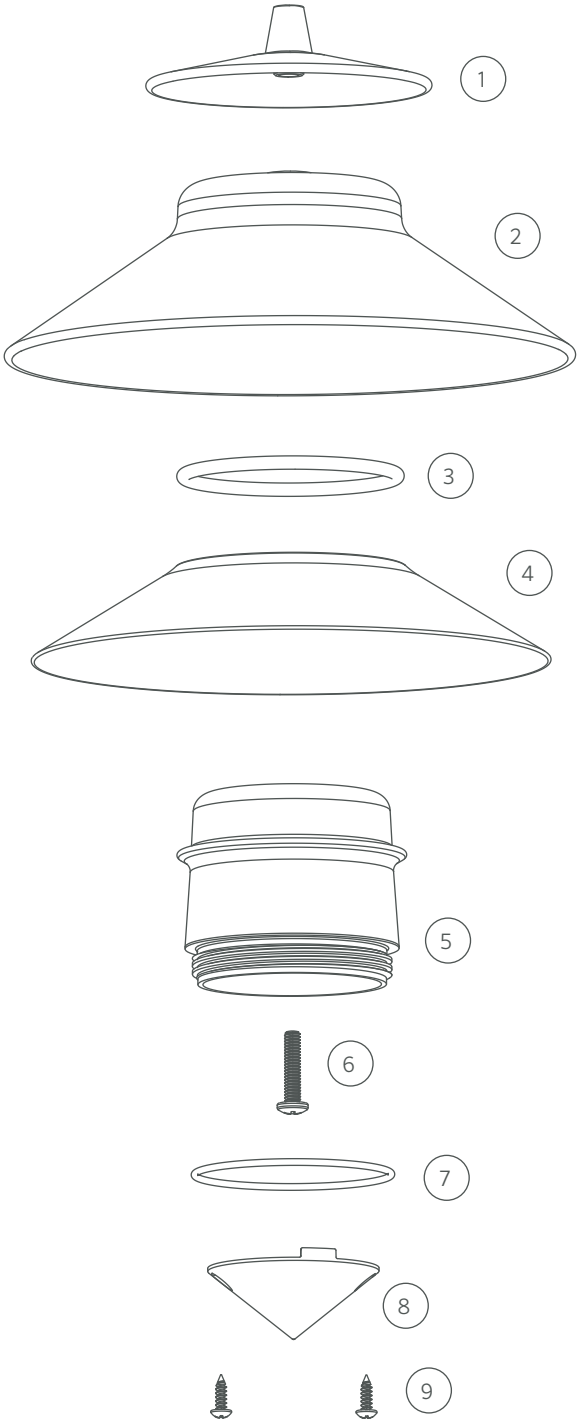
ITEM	DESCRIPTION	CATALOG #
1	Shade	-
2	Top	-
3	O-Ring	250010280011
4	Reflector, White	250018830000
5	Lens	753501
6	Screw, #8-32 x ¾"	250018780000
7	O-Ring	250010280032
8	Socket, G4	754601
9	Reducer	-
10	Riser, Aluminum	YYRXX*
11	Long Slot Spike (LSS)	250015840000
1-7	PL Top Assembly, G4	PLTAXX

** YY = Riser height in inches, XX = Powder coat color code*



Top Assembly Replacement Parts

ITEM	DESCRIPTION	CATALOG #
1	Shade	–
2	Top	–
3	O-Ring	250010280011
4	Reflector, White	250018830000
5	Lens	753500
6	Screw, #8-32 x ¾"	250018780000
7	O-Ring	250010280032
8	Reflector, Chrome	–
9	Screw, #4 x ⅜"	–
8-9	Grande Cone Kit	GCONEKIT





PROJECT

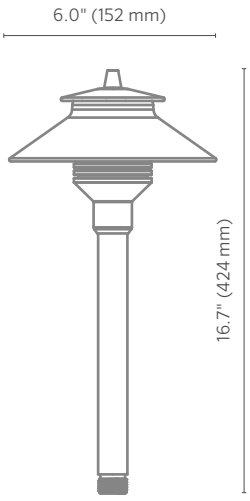
CATALOG #

TYPE

NOTES

PL Path Light **DESIGNER**

Shapely hat area light available in 1 or 3 LED. Aluminum construction. RGBW capable with **Luxor®** system.



Quick Facts

- Aluminum construction
- Two-layer marine-grade anodization and powder coat finish
- Cree® integrated LEDs
- Tamper-resistant features
- Color temperature filters
- Compatible with Luxor® technology
- Phase and PWM dimmable
- Input voltage: 10-15V

PL Path Light SPECIFICATIONS

Output	1LED	3LED	ZDC
Total Lumens†	26	84	66
Input Voltage	10 to 15V	10 to 15V	11 to 15V
Input Power (W)	2.0	4.2	6.0
VA	2.4	4.5	7.2
Efficacy (Lumens/Watt)	13	21	21
Color Rendering Index (CRI)	80+	80+	80+
Max Candela	12	27	26
Dimming	PWM, Phase**	PWM, Phase**	--
RGBW Available	No	No	Yes
Luxor Compatibility			
Default	Zoning	Zoning	--
ZD Option	Zoning/Dimming	Zoning/Dimming	--
ZDC Option	--	--	Zoning/Dimming/Color
Minimum Rated Life (L70)	50,000 Hrs	50,000 Hrs	50,000 Hrs

*** For optimal performance, use a trailing-edge, phase-cut dimmer.*
† Measured using the 3,900K CCT lens. Multipliers for other CCTs include 0.80 (2,700K), 0.65 (4,500K), and 0.65 (5,200K).

FX Luminaire
FX Luminaire is an industry-leading manufacturer of landscape and architectural lighting products with a focus on the advancement of LED technology and digital lighting control with zoning, dimming, and color adjustment capabilities. We offer a full spectrum of specification-driven lighting fixtures that can be utilized to create elegant, cutting-edge landscape lighting systems for commercial or residential applications. Our products are available exclusively via our extensive professional distributor network.

Materials
Die-cast aluminum A380 housing, top/shade, and riser.

Socket
Socket contains MoistureBlock™ technology, preventing moisture from wicking up into sealed areas of the fixture.

Lamp
Integrated module with Cree LEDs. Gold-plated connectors and conformal coated for maximum reliability and corrosion resistance. Proprietary on-board intelligent driver uses firmware-controlled temperature regulation, maximizing LED life. Field upgradeable and replaceable, the LEDs are rated to 50,000 hrs. Maximum drive current: 1 A.

Optics
Polycarbonate color temperature adjustment lenses included with fixture: 2,700K (preinstalled), 3,900K (no lens), 4,500K, and 5,200K. Conical reflector maximizes distribution according to riser height. Color temperature lenses field serviceable.

Wiring
18 AWG (1 mm); SPT-1W; 220°F (105°C); 300V; 10' (3 m) length without riser.

Power
Input 10-15 VAC/VDC, 50/60Hz. Remote transformer required (specify separately).

Housing
Die-cast aluminum housing with capacity for 1LED, 3LED, or ZDC integrated LEDs.

Riser
¾" (19 mm) aluminum riser with machined male threads.

Threads
Machined brass fitting with ½"-14 (13 mm) NPSM threads.

Lens
Frosted polycarbonate lens with high tolerance for thermal expansion, stress, and abuse.

Finish
Two-layer protection of sulfuric acid anodization and polyester TGIC powder coat, providing superior outdoor weathering in all conditions. Tested to ASTM standards.

Hardware
Includes 12" (305 mm) ABS slotted installation spike..

Ambient Operating Temperature
0°F to 140°F (-18°C to 60°C)

Weight
2.3 lbs. (1.0 kg)

Manufacturing
ISO 9001:2015 certified facility.

International Compliance
Compliant per IEC 60598-1 and IEC 60598-2-7 when used with ground mount ("GM-XX") accessory, or alternate mount greater than or equal to IP65.

Installation Requirements
Designed for installation in the downward lighting direction only.

Warranty
10-year limited warranty.

Control
ZD or **ZDC** options utilize Luxor technology to zone light fixtures in up to 250 groups, dim each group in 1% increments between 0 and 100%, or change to one of 30,000 colors with RGBW LEDs. Select the ZD option for zoning/dimming or ZDC for zoning/dimming/color. Standard fixture is zoneable with **Luxor**.

Sustainability
Innovation meets conservation in the design and manufacturing of our products. Where we can, we use recycled materials while maintaining superior functionality. Our LED products provide high-quality light at optimal energy efficiency, lifespan, and durability.

Listings
c UL us LISTED 3YJ8 · RoHS COMPLIANT · CE · IP 65

PL Path Light ORDERING INFORMATION

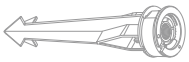
Top Assembly	Top Finish	Riser Type	Luxor Option	Lamp	Riser	Finish
PL*	BZ	A* *(Aluminum)*	[Default] *Zone*	1LED *44 Lumens*	8RA *8" (203 mm) Riser*	BZ *Bronze Metallic*
	DG		ZD *Zone/Dim*	3LED *94 Lumens*	12RA *12" (305 mm) Riser*	DG *Desert Granite*
	WI		ZDC *Zone/Dim/Color*	[default] *83 Lumens*	18RA *18" (457 mm) Riser*	WI *Weathered Iron*
	SB				24RA* *24" (610 mm) Riser*	SB *Sedona Brown*
	FB				30RA *30" (762 mm) Riser*	FB *Black*
	WG				36RA* *36" (914 mm) Riser*	WG *White Gloss*
	FW					FW *Flat White*
	AL					AL *Almond*

EXAMPLE FIXTURE CONFIGURATION: PL-FB + A-ZD-3LED-18RA-FB

PL	-		+		-		-		-		-	

** Ships with Long Slot Spike (250015840000)*

MOUNTING OPTIONS: Specify Separately

Mounts	Code	
SUPER J-BOX *2.5" (64 mm) x 12" (305 mm)*	SJ-XX*	
PROAIM RATCHETING SPIKE *2.4" (61 mm) x 10" (254 mm)*	PARS	
3-PRONG SPIKE *5.0" (127 mm) x 9.0" (229 mm)*	250020020000	
POST MOUNT *2.5" (64 mm) x 13" (330 mm)*	PM-XX*	
GROUND MOUNT *2.7" (67 mm) Diameter*	GM-XX*	
VERSABOX® *2.2" (57 mm) x 1.5" (39 mm)*	VB-050-XX*	

COUPLING OPTIONS: Order Individually

Couplings	Code	
STRAIGHT *1.3" (32 mm) x 2.0" (51 mm)*	COUP-XX*	

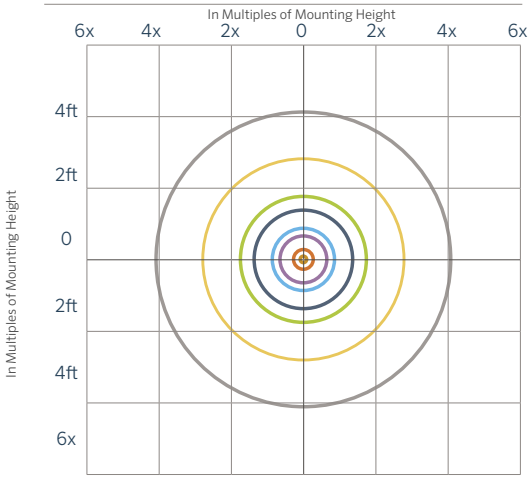
RISER OPTIONS: Order Individually

Riser	Code	
ALUMINUM RISER *0.8" (21 mm) Diameter*	YY-R-XX*	

**YY = riser height in inches (6" increments between 6" and 36"; 150 mm increments between 150 mm and 900 mm), XX = finish code*

PL Path Light PHOTOMETRICS

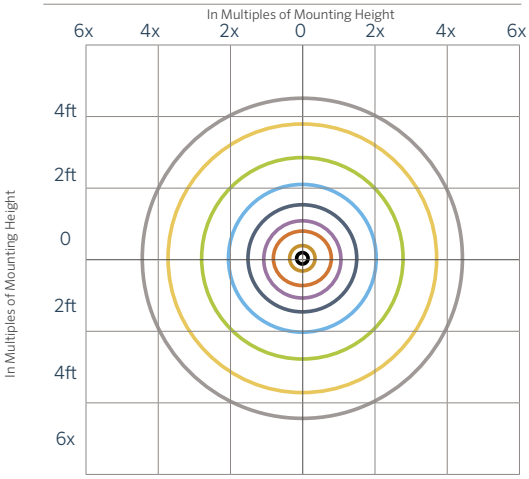
PL 1LED Isofootcandle Plot



20 fc (215 lx) 2.5 fc (27 lx) 0.2 fc (2 lx)
10 fc (108 lx) 1 fc (11 lx) 0.1 fc (1 lx)
5 fc (54 lx) 0.5 fc (5 lx) 50% Max Cd

Mounting Height: 1' (305 mm) Total LLF: 1

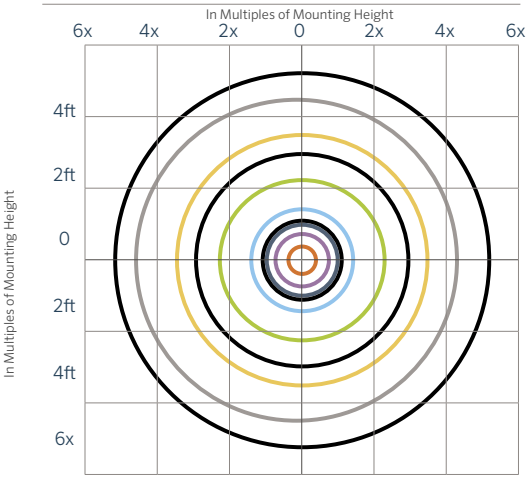
PL 3LED Isofootcandle Plot



20 fc (215 lx) 2.5 fc (27 lx) 0.2 fc (2 lx)
10 fc (108 lx) 1 fc (11 lx) 0.1 fc (1 lx)
5 fc (54 lx) 0.5 fc (5 lx) 50% Max Cd

Mounting Height: 1' (305 mm) Total LLF: 1

PL ZDC Isofootcandle Plot



20 fc (215 lx) 2.5 fc (27 lx) 0.2 fc (2 lx)
10 fc (108 lx) 1 fc (11 lx) 0.1 fc (1 lx)
5 fc (54 lx) 0.5 fc (5 lx) 50% Max Cd

Mounting Height: 1' (305 mm) Total LLF: 1

LIGHT LABORATORY INC.
8165 E Kaiser Blvd. Anaheim, CA 92808
p. 714.282.2270
f. 714.676.5558

Report No: L121506103
Date: 1/8/2016

NVLAP LAB CODE 200927-0

Report No: **L121506103**

Report Prepared For: Hunter Industries / FX Luminaire
1775 La Costa Meadows Dr

Model Number: **PL-ZDC-12RA-BZ**

Test: Electrical and Photometric tests

Standards Used: Appropriate part or all test guidelines were used for test performed:
IESNA LM79: 2008 Approved Methods for Electrical and Photometric Measurements of Solid-State Lighting Products
ANSI NEMA ANSLG C78.377: 2008 Specification of the Chromaticity of Solid State Lighting Products
ANSI C82.77:2002: Harmonic Emission Limits-Related Quality Requirements for Lighting Equipment

Description of Sample: Client submitted the sample. Catalog number is PL-ZDC-12RA-BZ. Received in working and undamaged condition. No modifications were necessary.

Testing Condition: Fixture is tested with no special conditions.

Sample Arrival Date: 12/21/15

Date of Tests: 1/4/16 - 1/8/16

Seasoning of Sample: No seasoning was performed in accordance with IESNA LM-79.

Equipment List

Equipment Used	Model No	Stock No	Calibration Due Date
Chroma Programmable AC Source	61604	PS-AC02	--
Yokogawa Digital Power Meter	WT210	MT-EL06-S1	11/18/16
Xitron Power Analyzer	2503AH	MT-EL01	11/30/16
ITECH DC Power Supply	IT6122	PSDC-03-S1	11/17/16
Fluke Digital Thermometer	52k/J	MT-TP02-GC	11/24/16
LLI Type C Goniophotometer System	RMG-C-MKII	CD-LL04-GC	--
LLI 2M Sphere	2MR97	CD-SN03-S2	--
LLI Spectroradiometer	SPR-3000	MT-SC01-S2	Before Use

*All Results in accordance to IESNA LM-79-2008: Approved Method for the Electrical and Photometric Testing of Solid-State Lighting.

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NVLAP LAB CODE 200927-0

Test Summary	
Manufacturer:	Hunter Industries / FX Luminaire
Model Number:	PL-ZDC-12RA-BZ
Driver Model Number:	N/A
Total Lumens:	66.18
Input Voltage (VAC/60Hz):	12.00
Input Current (Amp):	0.29
Input Power (W):	3.20
Input Power Factor:	0.92
Current ATHD @ 120V(%):	39%
Current ATHD @ 277V(%):	N/A
Efficacy:	21
Color Rendering Index (CRI):	85
Correlated Color Temperature (K):	4146
Chromaticity Coordinate x:	0.3743
Chromaticity Coordinate y:	0.3729
Ambient Temperature (°C):	25.0
Stabilization Time (Hours):	0:50
Total Operating Time (Hours):	1:20
Off State Power(W):	0.00



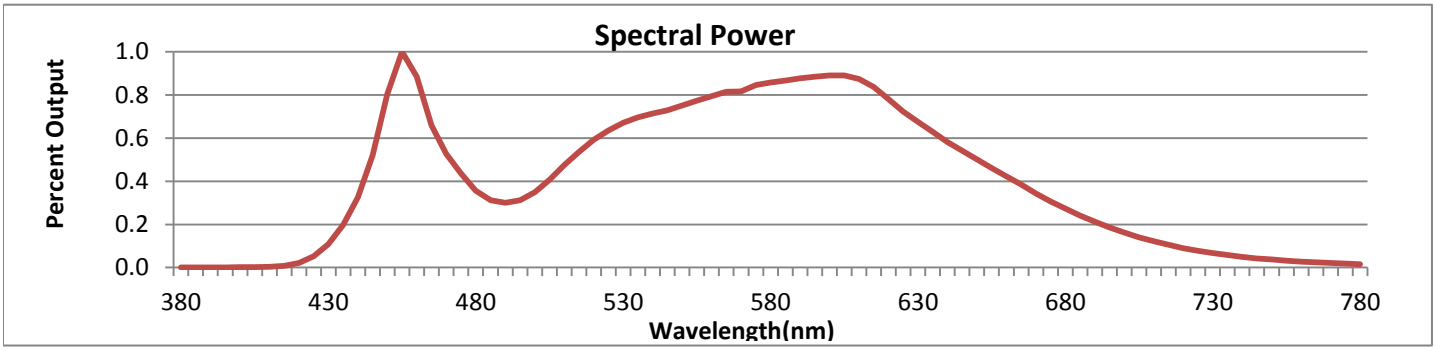
FIG. 1 LUMINAIRE

*All Results in accordance to IESNA LM-79-2008: Approved Method for the Electrical and Photometric Testing of Solid-State Lighting.

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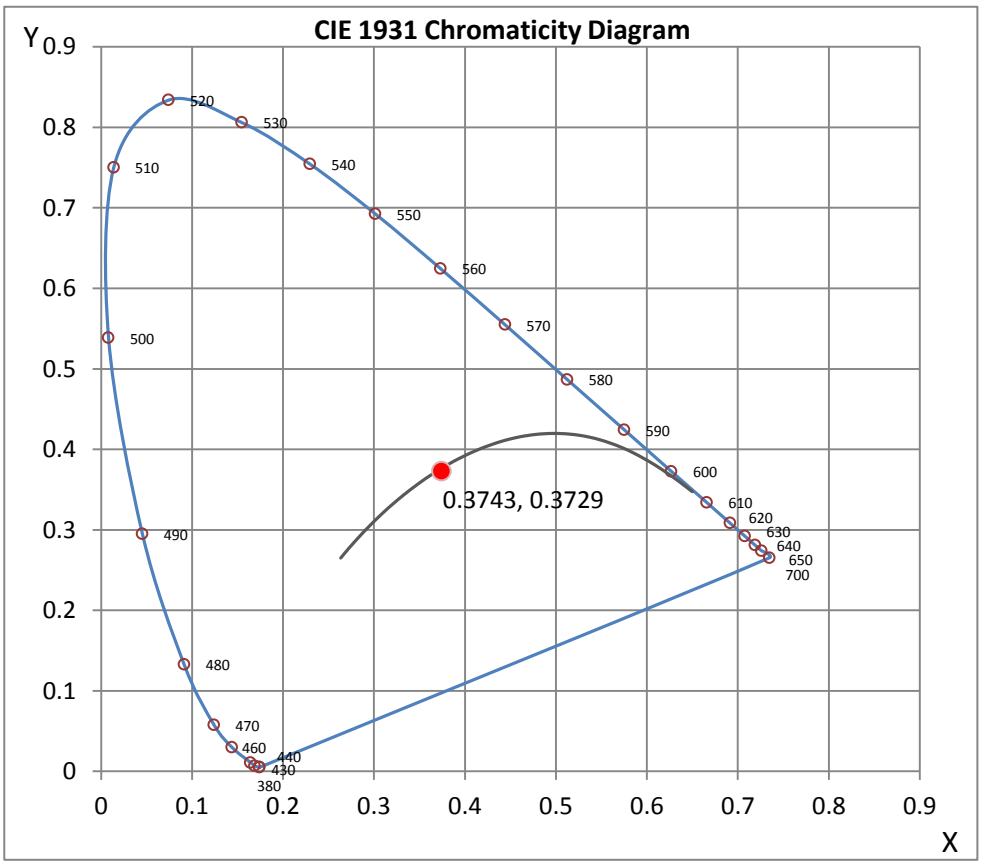
Wavelength	W/m²nm	440	0.3252	510	0.4747	580	0.8582	650	0.5025	720	0.0896
380	0.0012	450	0.8041	520	0.5920	590	0.8782	660	0.4227	730	0.0672
390	0.0010	460	0.8844	530	0.6708	600	0.8914	670	0.3433	740	0.0498
400	0.0014	470	0.5280	540	0.7142	610	0.8746	680	0.2728	750	0.0370
410	0.0035	480	0.3568	550	0.7510	620	0.7811	690	0.2124	760	0.0273
420	0.0213	490	0.3004	560	0.7944	630	0.6764	700	0.1619	770	0.0208
430	0.1090	500	0.3496	570	0.8170	640	0.5824	710	0.1220	780	0.0157

CRI & CCT

x	0.3743
y	0.3729
u'	0.2226
v'	0.4990
CRI	84.80
CCT	4146
Duv	0.00004

R Values

R1	84.18
R2	91.38
R3	94.58
R4	81.99
R5	82.39
R6	86.01
R7	87.82
R8	69.67
R9	22.54
R10	76.81
R11	79.41
R12	58.60
R13	86.33
R14	96.61



*All Results in accordance to IESNA LM-79-2008: Approved Method for the Electrical and Photometric Testing of Solid-State Lighting.

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NVLAP LAB CODE 200927-0

Test Methods

Photometric Measurements - Goniophotometer

A Custom Light Laboratory Type C Rotating Mirror Goniophotometer was used to measure candelas(intensity) at each angle of distribution as defined by IESNA for the appropriate fixture type.

Ambient temperature is set to 25°C and is measured from the center of the fixture, within 1ft from the outside of the fixture. Temperature is maintained at 25°C throughout the testing process and the sample is stabilized for at least 30mins and longer as necessary for the sample to achieve stabilization.

Electrical measurements are measured using the listed equipment.

Spectral Measurements - Integrating Sphere

A Sensing Spectroradiometer SPR-3000, in conjunction with Light Laboratory 2 meter integrating sphere was used to measure chromaticity coordinates, correlated color temperature(CCT) and the color rendering index(CRI) for each sample.

Ambient temperature is set to 25°C and is measured from the center of the fixture, within 1ft from the outside of the fixture. Temperature is maintained at 25°C throughout the testing process and the sample is stabilized for at least 30mins and longer as necessary for the sample to achieve stabilization.

Electrical measurements are measured using the listed equipment.

Disclaimers:

This report must not be used by the customer to claim product certification, approval or endorsement by NVLAP, NIST or any agency of Federal Government.

Report Prepared by : Keyur Patel

Test Report Released by:

Jeff Ahn
Engineering Manager

Test Report Reviewed by:

Steve Kang
Quality Assurance

**Attached are photometric data reports. Total number of pages: 8*

*All Results in accordance to IESNA LM-79-2008: Approved Method for the Electrical and Photometric Testing of Solid-State Lighting.

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Photometric Test Report

IES FLOOD REPORT
PHOTOMETRIC FILENAME : L121506103.IES

DESCRIPTIVE INFORMATION (From Photometric File)

IESNA:LM-63-2002
[TEST] L121506103
[TESTLAB] LIGHT LABORATORY, INC.
[ISSUEDATE] 1/7/2016
[MANUFAC] HUNTER INDUSTRIES/FX LUMINAIRE
[LUMCAT] PL-ZDC-12RA-BZ
[LUMINAIRE] 5.75"DIA. X 16"H. LED FIXTURE
[BALLASTCAT] N.A.
[LAMPPOSITION] 0,0
[LAMPCAT] N/A
[OTHER] INDICATING THE CANDELA VALUES ARE ABSOLUTE AND
[MORE] SHOULD NOT BE FACTORED FOR DIFFERENT LAMP RATINGS.
[INPUT] 12VAC, 3.20W
[TEST PROCEDURE] IESNA:LM-79-08

Note: Candela values converted from Type-C to Type-B

CHARACTERISTICS

NEMA Type	7 H x 7 V
Maximum Candela	26.25
Maximum Candela Angle	0H 0V
Horizontal Beam Angle (50%)	76.6
Vertical Beam Angle (50%)	76.6
Horizontal Field Angle (10%)	169.4
Vertical Field Angle (10%)	169.4
Lumens Per Lamp	N.A. (absolute)
Total Lamp Lumens	N.A. (absolute)
Beam Lumens	24
Beam Efficiency	N.A.
Field Lumens	66
Field Efficiency	N.A.
Spill Lumens	0
Luminaire Lumens	66
Total Efficiency	N.A.
Total Luminaire Watts	3.2
Ballast Factor	1.00

Photometric Toolbox Professional Edition - Copyright 2002-2011 by Lighting Analysts, Inc.
Calculations based on published IES Methods and recommendations, values rounded for display purposes.
Results derived from content of manufacturers photometric file.

IES FLOOD REPORT
PHOTOMETRIC FILENAME : L121506103.IES

AXIAL CANDELA

DEG.	HOR.	DEG.	VERT.
90	0	90	0
85	2.32	85	2.32
75	12.73	75	12.73
65	8.67	65	8.67
55	8.41	55	8.41
47.5	9.79	47.5	9.79
42.5	11.09	42.5	11.09
37.5	13.51	37.5	13.51
33	16.52	33	16.52
29	18.66	29	18.66
25.5	18.92	25.5	18.92
22.5	19.11	22.5	19.11
19.5	19.36	19.5	19.36
17	19.87	17	19.87
15	20.28	15	20.28
13	20.93	13	20.93
11	21.58	11	21.58
9	22.51	9	22.51
7	23.7	7	23.7
5	24.89	5	24.89
3	25.43	3	25.43
1	25.98	1	25.98
0	26.25	0	26.25
-1	25.98	-1	25.98
-3	25.43	-3	25.43
-5	24.89	-5	24.89
-7	23.7	-7	23.7
-9	22.51	-9	22.51
-11	21.58	-11	21.58
-13	20.93	-13	20.93
-15	20.28	-15	20.28
-17	19.87	-17	19.87
-19.5	19.36	-19.5	19.36
-22.5	19.11	-22.5	19.11
-25.5	18.92	-25.5	18.92
-29	18.66	-29	18.66
-33	16.52	-33	16.52
-37.5	13.51	-37.5	13.51
-42.5	11.09	-42.5	11.09
-47.5	9.79	-47.5	9.79
-55	8.41	-55	8.41
-65	8.67	-65	8.67
-75	12.73	-75	12.73
-85	2.32	-85	2.32
-90	0	-90	0

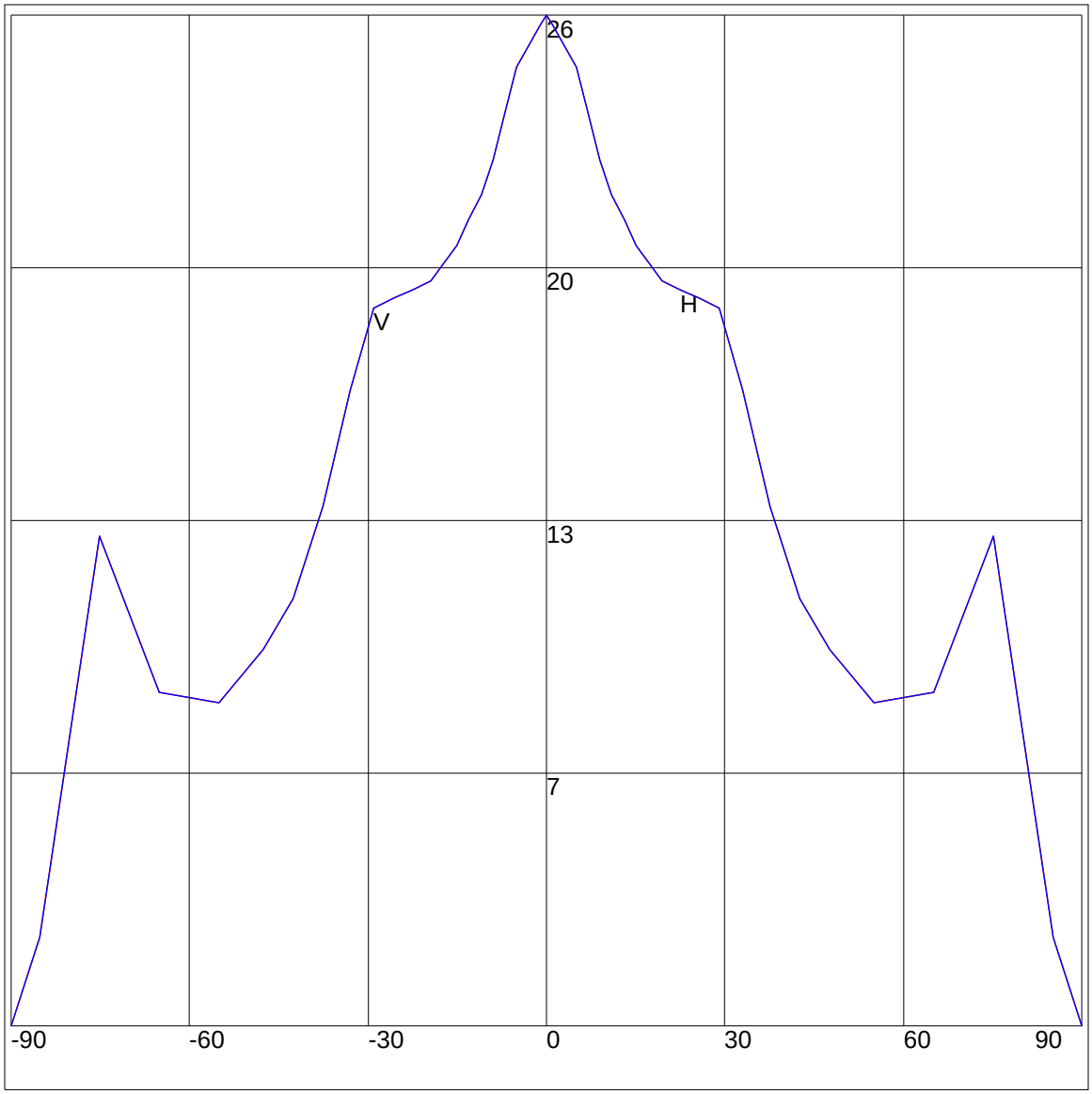
ZONAL LUMEN SUMMARY

Zone	%
0-20	12
0-30	25.2
0-40	39.3
0-60	62.9
0-80	94.3
0-90	100
10-90	96.6
20-40	27.3
20-50	39.4
40-70	36.9
60-80	31.4
70-80	18
80-90	5.7
90-110	0
90-120	0
90-130	0
90-150	0
90-180	0
110-180	0
0-180	100

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Results derived from content of manufacturers photometric file.

IES FLOOD REPORT
PHOTOMETRIC FILENAME : L121506103.IES

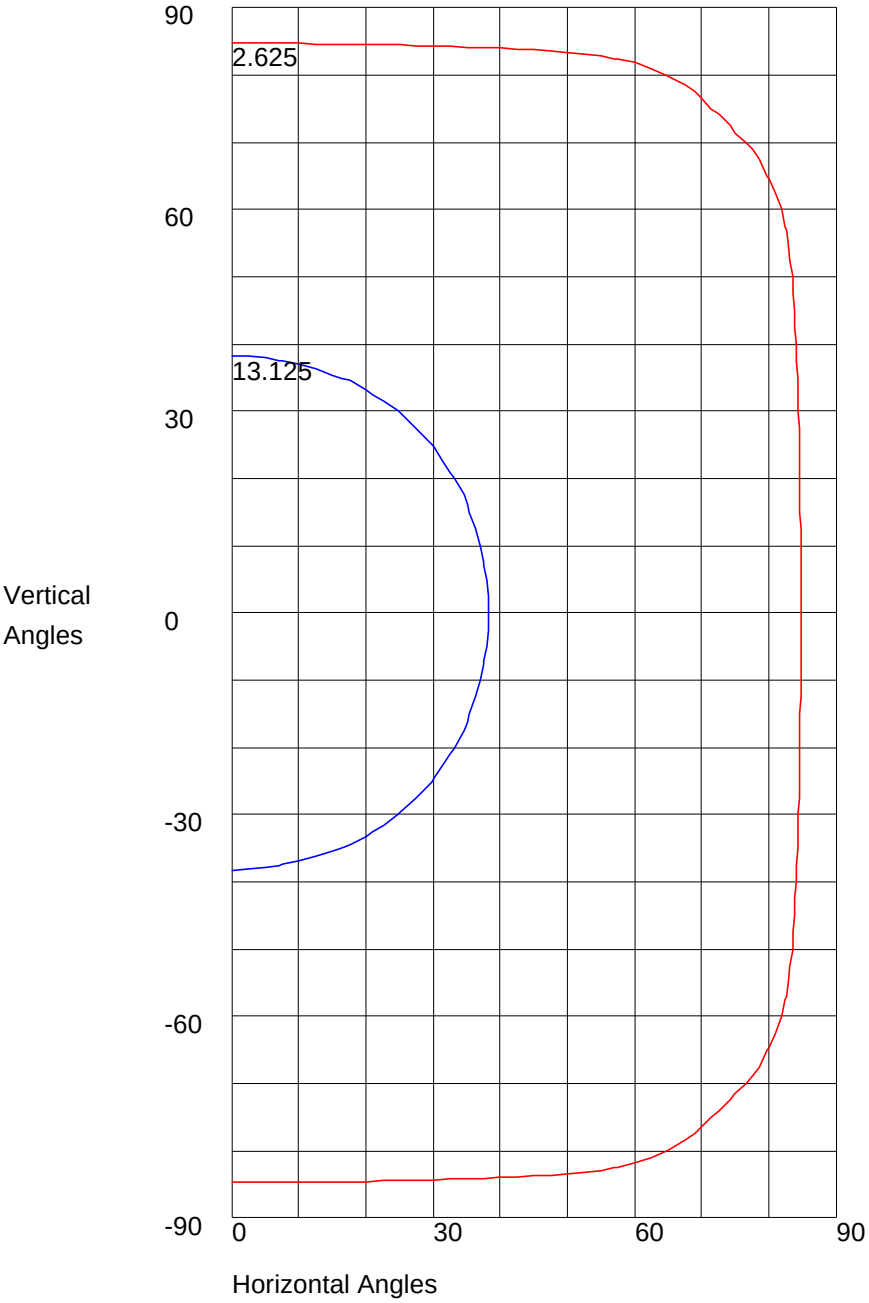
AXIAL CANDELA DISPLAY



Maximum Candela = 26.25 Located At Horizontal Angle = 0, Vertical Angle = 0
H - Horizontal Axial Candela
V - Vertical Axial Candela

IES FLOOD REPORT
PHOTOMETRIC FILENAME : L121506103.IES

ISOCANDELA CURVES



Maximum Candela = 26.25 Located At Horizontal Angle = 0, Vertical Angle = 0
50% Maximum Candela = 13.125
10% Maximum Candela = 2.625

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Results derived from content of manufacturers photometric file.

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www.lightlaboratory.com

NVLAP TESTING
NVLAP LAB CODE 200927-0

Report No: **L021702005** **Issue Date: 2/15/2017**

Report Prepared For: Hunter Industries
1775 La Costa Meadows Dr. San Marcos CA 92708

Model Number: **PL-LED10W-12R-BZ**

Test: Electrical and Photometric tests

Standards Used: Appropriate part or all test guidelines were used for test performed:
IESNA LM79: 2008 Approved Methods for Electrical and Photometric Measurements of Solid-State Lighting Products
ANSI NEMA ANSLG C78.377: 2008 Specification of the Chromaticity of Solid State Lighting Products
ANSI C82.77:2002: Harmonic Emission Limits-Related Quality Requirements for Lighting Equipment

Description of Sample: Client submitted the sample. Received in working and undamaged condition. No modifications were necessary.

Testing Condition: Fixture is tested with no special conditions.

Sample Arrival Date: 2/9/17

Date of Tests: 2/13/17 - 2/15/17

Seasoning of Sample: No seasoning was performed in accordance with IESNA LM-79.

Equipment List

Equipment Used	Model No	Stock No	Calibration Due Date
Chroma Programmable AC Source	61604	PS-AC02	--
Yokogawa Digital Power Meter	WT210	MT-EL06-S1	11/28/17
ITECH	IT6122	PS-DC03-S1	11/28/17
Fluke Digital Thermometer	52k/J	MT-TP02-GC	11/28/17
LLI Type C Goniophotometer System	RMG-C-MKII	CD-LL04-GC	--
LLI 2M Sphere	2MR97	CD-SN03-S2	--
LLI Spectroradiometer	SPR-3000	MT-SC01-S2	Before Use

*All Results in accordance to IESNA LM-79-2008: Approved Method for the Electrical and Photometric Testing of Solid-State Lighting.

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NVLAP TESTING
NVLAP LAB CODE 200927-0

Test Summary	
Manufacturer:	Hunter Industries
Model Number:	PL-LED10W-12R-BZ
Driver Model Number:	N/A
Total Lumens:	19.40
Input Voltage (VAC/60Hz):	12.00
Input Current (Amp):	0.070
Input Power (W):	0.781
Input Power Factor:	0.93
Current ATHD @ 12V(%):	36%
Current ATHD @ 277V(%):	N/A
Efficacy:	25
Color Rendering Index (CRI):	84
Correlated Color Temperature (K):	2820
Chromaticity Coordinate x:	0.4484
Chromaticity Coordinate y:	0.4047
Ambient Temperature (°C):	25.0
Stabilization Time (Hours):	0:30
Total Operating Time (Hours):	1:35

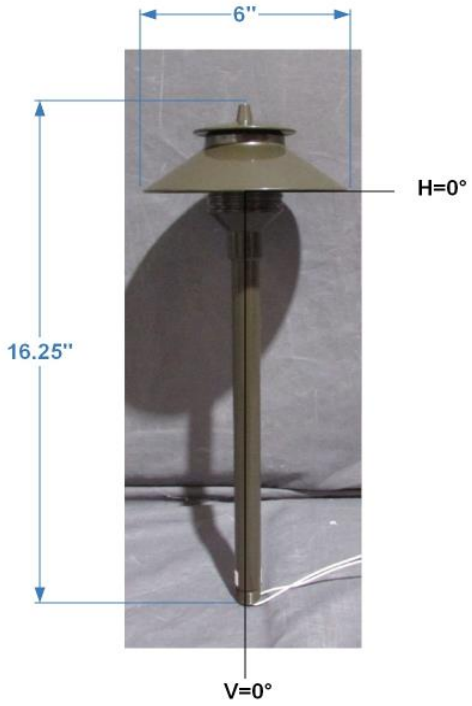


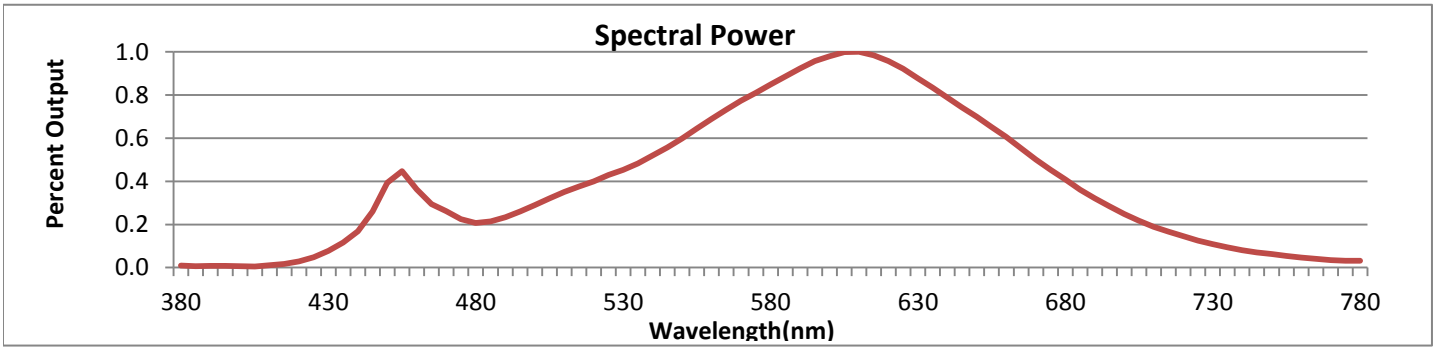
FIG. 1 LUMINAIRE

*All Results in accordance to IESNA LM-79-2008: Approved Method for the Electrical and Photometric Testing of Solid-State Lighting.

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Report No: L021702005

NVLAP TESTING
NVLAP LAB CODE 200927-0



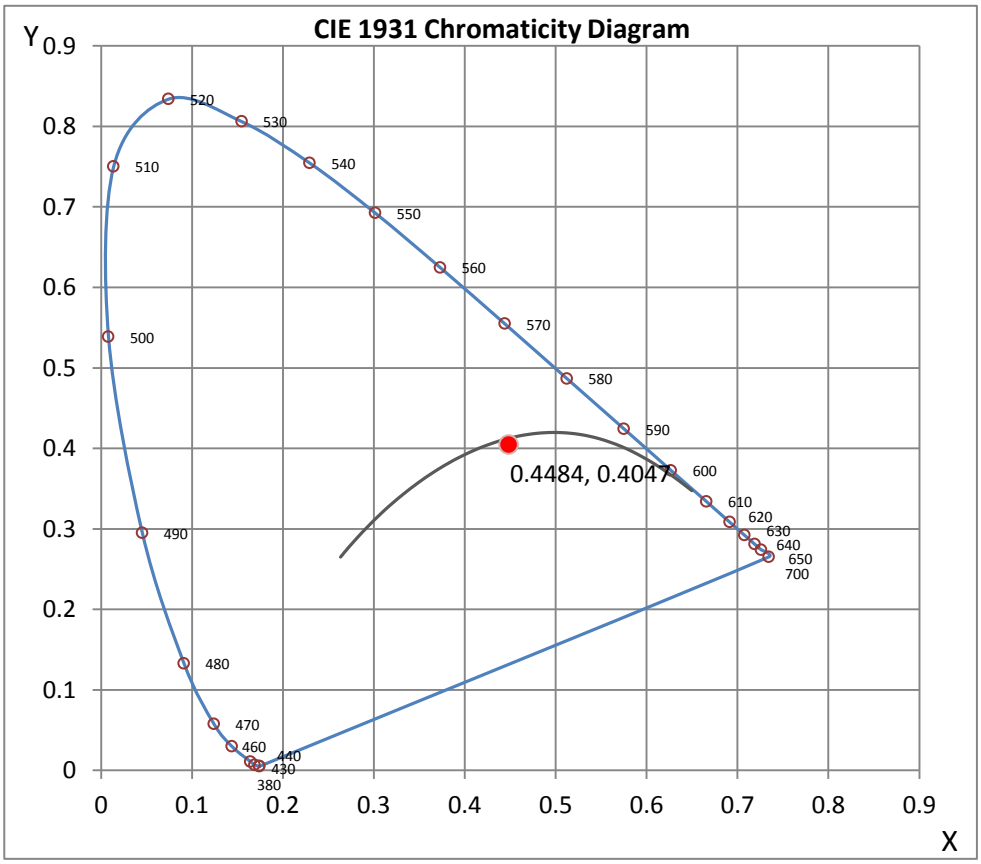
Wavelength	W/m²nm	440	0.1684	510	0.3502	580	0.8495	650	0.6990	720	0.1452
380	0.0090	450	0.3932	520	0.4002	590	0.9231	660	0.6054	730	0.1090
390	0.0087	460	0.3629	530	0.4527	600	0.9800	670	0.5004	740	0.0814
400	0.0065	470	0.2610	540	0.5192	610	1.0000	680	0.4080	750	0.0626
410	0.0108	480	0.2060	550	0.5988	620	0.9581	690	0.3214	760	0.0470
420	0.0288	490	0.2340	560	0.6887	630	0.8771	700	0.2486	770	0.0349
430	0.0772	500	0.2896	570	0.7744	640	0.7879	710	0.1894	780	0.0316

CRI & CCT

x	0.4484
y	0.4047
u'	0.2577
v'	0.5233
CRI	83.60
CCT	2820
Duv	-0.00114

R Values

R1	82.25
R2	92.30
R3	96.13
R4	80.01
R5	81.87
R6	90.03
R7	83.67
R8	62.81
R9	19.87
R10	81.91
R11	77.71
R12	74.49
R13	84.51
R14	98.56



*All Results in accordance to IESNA LM-79-2008: Approved Method for the Electrical and Photometric Testing of Solid-State Lighting.

LIGHT LABORATORY INC.
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NVLAP TESTING
NVLAP LAB CODE 200927-0

Test Methods

Photometric Measurements - Goniophotometer

A Custom Light Laboratory Type C Rotating Mirror Goniophotometer was used to measure candelas(intensity) at each angle of distribution as defined by IESNA for the appropriate fixture type.

Ambient temperature is set to 25°C and is measured from the center of the fixture, within 1ft from the outside of the fixture. Temperature is maintained at 25°C throughout the testing process and the sample is stabilized for at least 30mins and longer as necessary for the sample to achieve stabilization.

Electrical measurements are measured using the listed equipment.

Spectral Measurements - Integrating Sphere

A Sensing Spectroradiometer SPR-3000, in conjunction with Light Laboratory 2 meter integrating sphere was used to measure chromaticity coordinates, correlated color temperature(CCT) and the color rendering index(CRI) for each sample.

Ambient temperature is set to 25°C and is measured from the center of the fixture, within 1ft from the outside of the fixture. Temperature is maintained at 25°C throughout the testing process and the sample is stabilized for at least 30mins and longer as necessary for the sample to achieve stabilization.

Electrical measurements are measured using the listed equipment.

Disclaimers:

This report must not be used by the customer to claim product certification, approval or endorsement by NVLAP, NIST or any agency of Federal Government.

Report Prepared by : Keyur Patel

Test Report Released by:

Jeff Ahn
Engineering Manager

Test Report Reviewed by:

Steve Kang
Quality Assurance

**Attached are photometric data reports. Total number of pages: 8*

*All Results in accordance to IESNA LM-79-2008: Approved Method for the Electrical and Photometric Testing of Solid-State Lighting.

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Photometric Test Report

IES FLOOD REPORT
PHOTOMETRIC FILENAME : L021702005.IES

DESCRIPTIVE INFORMATION (From Photometric File)

IESNA:LM-63-2002
[TEST] L021702005
[TESTLAB] LIGHT LABORATORY, INC.
[ISSUEDATE] 2/15/2017
[MANUFAC] HUNTER INDUSTRIES
[LUMCAT] PL-LED10W-12R-BZ
[LUMINAIRE] PL FIXTURE, 1W G4, 12” RISER IN BRONZE
[BALLASTCAT] N/A
[LAMPPOSITION] 0,0
[LAMPCAT] N/A
[OTHER] INDICATING THE CANDELA VALUES ARE ABSOLUTE AND
[MORE] SHOULD NOT BE FACTORED FOR DIFFERENT LAMP RATINGS.
[INPUT] 12VAC, 0.781W
[TEST PROCEDURE] IESNA:LM-79-08

Note: Candela values converted from Type-C to Type-B

CHARACTERISTICS

NEMA Type	7 H x 7 V
Maximum Candela	12.143
Maximum Candela Angle	0H 0V
Horizontal Beam Angle (50%)	34.9
Vertical Beam Angle (50%)	54.6
Horizontal Field Angle (10%)	156.3
Vertical Field Angle (10%)	171.3
Lumens Per Lamp	N.A. (absolute)
Total Lamp Lumens	N.A. (absolute)
Beam Lumens	4
Beam Efficiency	N.A.
Field Lumens	19
Field Efficiency	N.A.
Spill Lumens	0
Luminaire Lumens	19
Total Efficiency	N.A.
Total Luminaire Watts	0.781
Ballast Factor	1.00

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Results derived from content of manufacturers photometric file.

IES FLOOD REPORT
PHOTOMETRIC FILENAME : L021702005.IES

AXIAL CANDELA

DEG.	HOR.	DEG.	VERT.
90	.053	90	.07
85	.386	85	1.387
75	1.597	75	3.142
65	2.001	65	1.966
55	2.668	55	2.194
47.5	3.248	47.5	2.66
42.5	3.617	42.5	3.028
37.5	3.985	37.5	3.467
33	4.438	33	4.357
29	4.968	29	5.611
25.5	5.46	25.5	6.569
22.5	5.671	22.5	6.636
19.5	5.862	19.5	6.6
17	6.116	17	6.776
15	6.32	15	6.917
13	6.79	13	7.233
11	7.261	11	7.548
9	7.959	9	8.022
7	8.928	7	8.731
5	10.024	5	9.673
3	11.305	3	11.393
1	12.113	1	12.095
0	12.143	0	12.143
-1	12.113	-1	12.095
-3	11.305	-3	11.393
-5	10.024	-5	9.673
-7	8.928	-7	8.731
-9	7.959	-9	8.022
-11	7.261	-11	7.548
-13	6.79	-13	7.233
-15	6.32	-15	6.917
-17	6.116	-17	6.776
-19.5	5.862	-19.5	6.6
-22.5	5.671	-22.5	6.636
-25.5	5.46	-25.5	6.569
-29	4.968	-29	5.611
-33	4.438	-33	4.357
-37.5	3.985	-37.5	3.467
-42.5	3.617	-42.5	3.028
-47.5	3.248	-47.5	2.66
-55	2.668	-55	2.194
-65	2.001	-65	1.966
-75	1.597	-75	3.142
-85	.386	-85	1.387
-90	.053	-90	.07

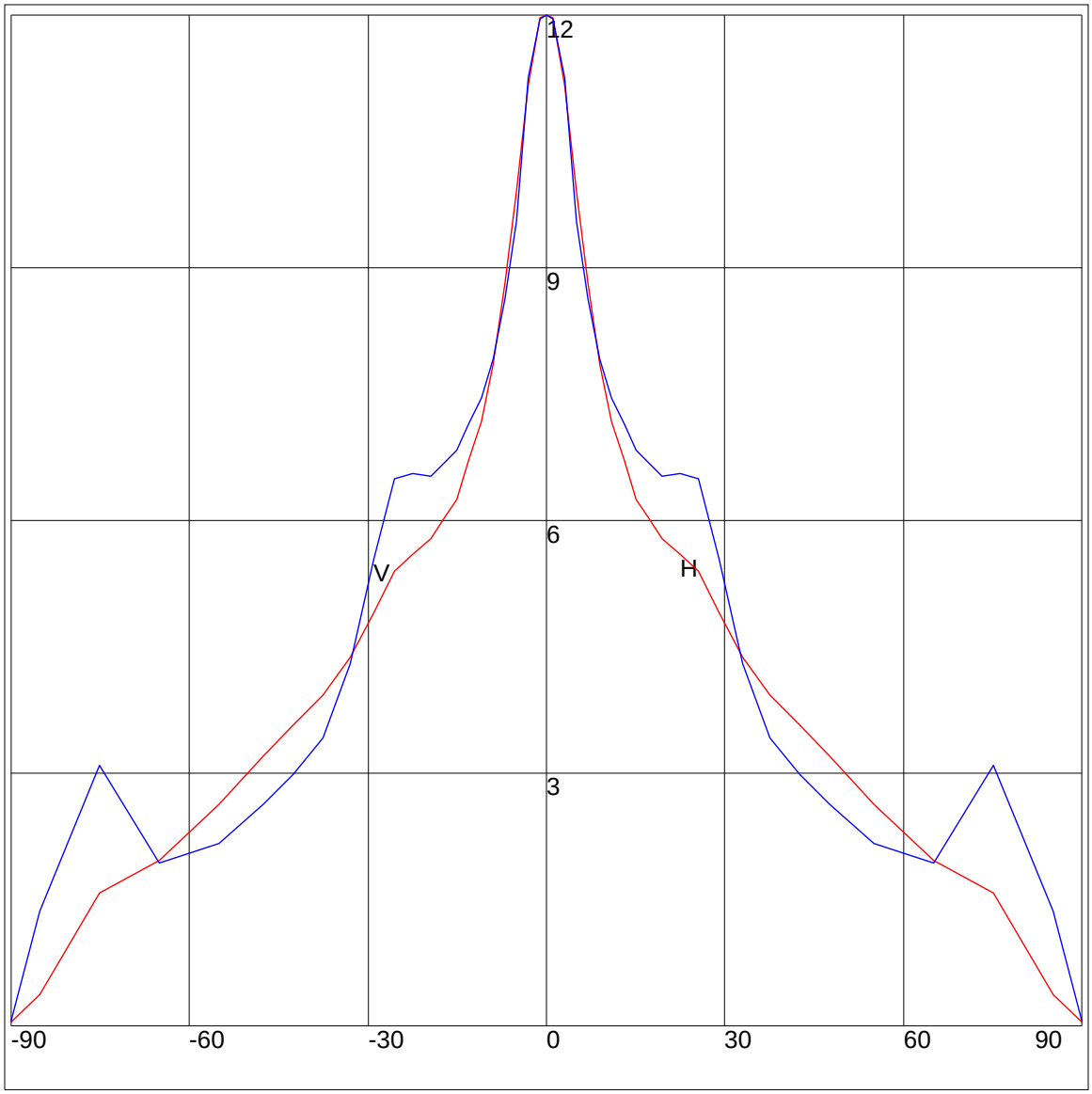
ZONAL LUMEN SUMMARY

Zone	%
0-20	14.3
0-30	28.8
0-40	42.2
0-60	65.8
0-80	91.8
0-90	100
10-90	95.5
20-40	27.9
20-50	40.4
40-70	34.2
60-80	26
70-80	15.4
80-90	8.2
90-110	0
90-120	0
90-130	0
90-150	0
90-180	0
110-180	0
0-180	100

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Results derived from content of manufacturers photometric file.

IES FLOOD REPORT
PHOTOMETRIC FILENAME : L021702005.IES

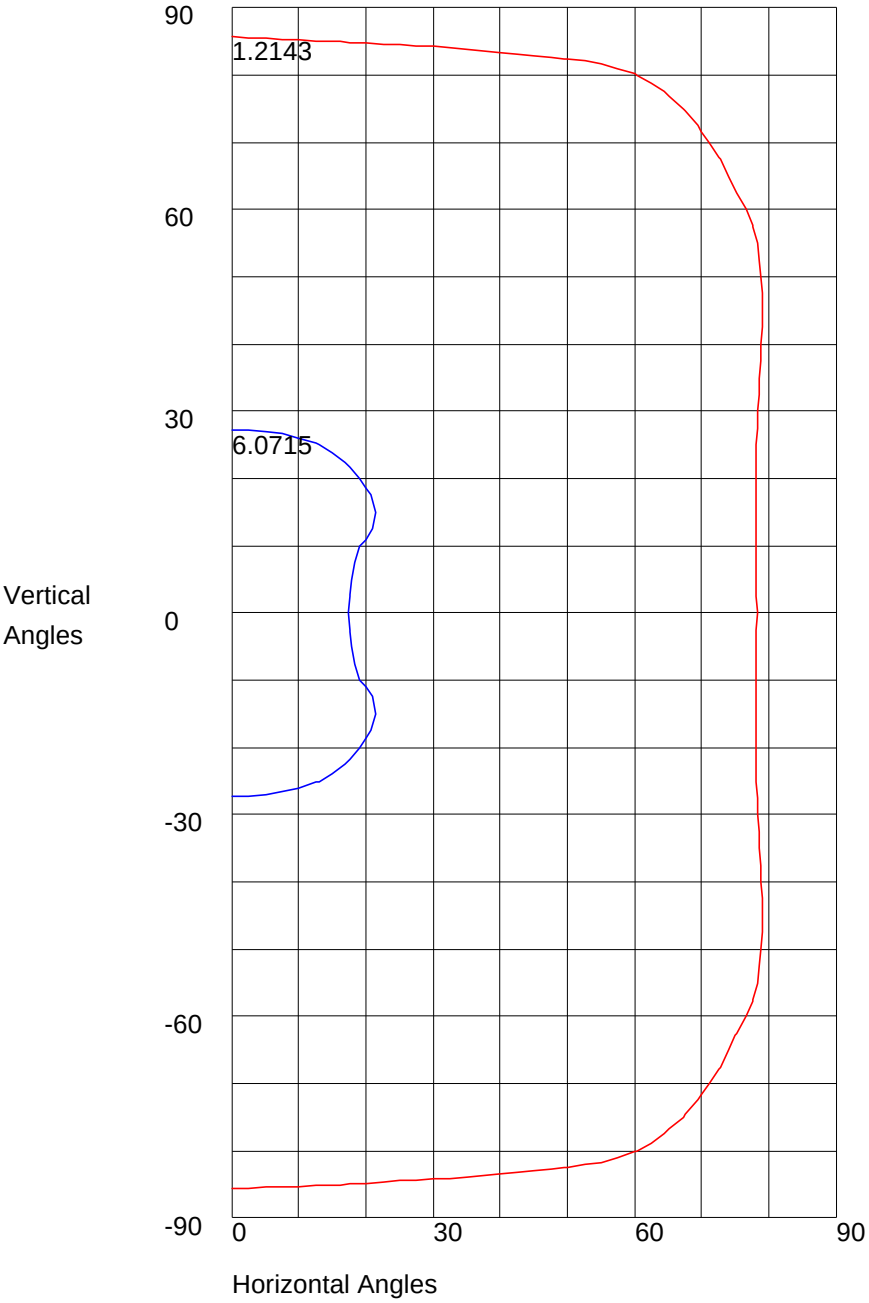
AXIAL CANDELA DISPLAY



Maximum Candela = 12.143 Located At Horizontal Angle = 0, Vertical Angle = 0
H - Horizontal Axial Candela
V - Vertical Axial Candela

IES FLOOD REPORT
PHOTOMETRIC FILENAME : L021702005.IES

ISOCANDELA CURVES



Maximum Candela = 12.143 Located At Horizontal Angle = 0, Vertical Angle = 0
50% Maximum Candela = 6.0715
10% Maximum Candela = 1.2143

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www.lightlaboratory.com

NVLAP TESTING
NVLAP LAB CODE 200927-0

Report No: **L021702006** **Issue Date: 2/16/2017**

Report Prepared For: Hunter Industries
1775 La Costa Meadows Dr. San Marcos CA 92708

Model Number: **PL-LED20W-12R-BZ**

Test: Electrical and Photometric tests

Standards Used: Appropriate part or all test guidelines were used for test performed:
IESNA LM79: 2008 Approved Methods for Electrical and Photometric Measurements of Solid-State Lighting Products
ANSI NEMA ANSLG C78.377: 2008 Specification of the Chromaticity of Solid State Lighting Products
ANSI C82.77:2002: Harmonic Emission Limits-Related Quality Requirements for Lighting Equipment

Description of Sample: Client submitted the sample. Received in working and undamaged condition. No modifications were necessary.

Testing Condition: Fixture is tested with no special conditions.

Sample Arrival Date: 2/9/17

Date of Tests: 2/16/17 - 2/16/17

Seasoning of Sample: No seasoning was performed in accordance with IESNA LM-79.

Equipment List

Equipment Used	Model No	Stock No	Calibration Due Date
Chroma Programmable AC Source	61604	PS-AC02	--
Yokogawa Digital Power Meter	WT210	MT-EL06-S1	11/28/17
ITECH	IT6122	PS-DC03-S1	11/28/17
Fluke Digital Thermometer	52k/J	MT-TP02-GC	11/28/17
LLI Type C Goniophotometer System	RMG-C-MKII	CD-LL04-GC	--
LLI 2M Sphere	2MR97	CD-SN03-S2	--
LLI Spectroradiometer	SPR-3000	MT-SC01-S2	Before Use

*All Results in accordance to IESNA LM-79-2008: Approved Method for the Electrical and Photometric Testing of Solid-State Lighting.

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NVLAP TESTING
NVLAP LAB CODE 200927-0

Test Summary	
Manufacturer:	Hunter Industries
Model Number:	PL-LED20W-12R-BZ
Driver Model Number:	N/A
Total Lumens:	33.83
Input Voltage (VAC/60Hz):	12.00
Input Current (Amp):	0.105
Input Power (W):	1.160
Input Power Factor:	0.92
Current ATHD @ 12V(%):	38%
Current ATHD @ 277V(%):	N/A
Efficacy:	29
Color Rendering Index (CRI):	83
Correlated Color Temperature (K):	2602
Chromaticity Coordinate x:	0.4627
Chromaticity Coordinate y:	0.4030
Ambient Temperature (°C):	25.0
Stabilization Time (Hours):	0:35
Total Operating Time (Hours):	1:35

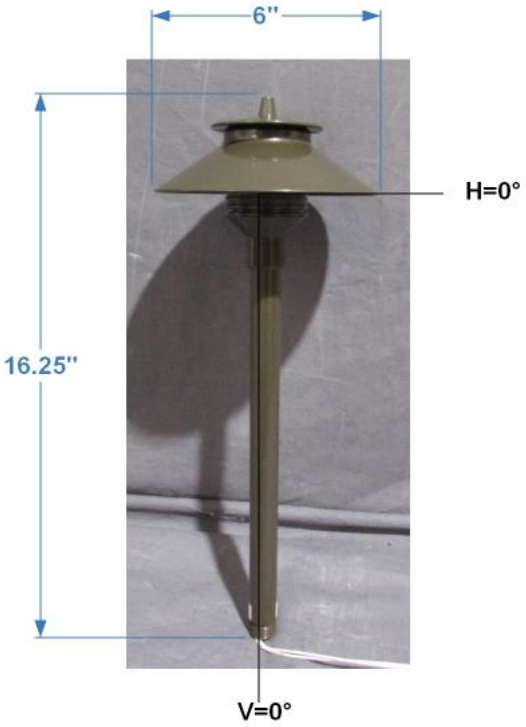


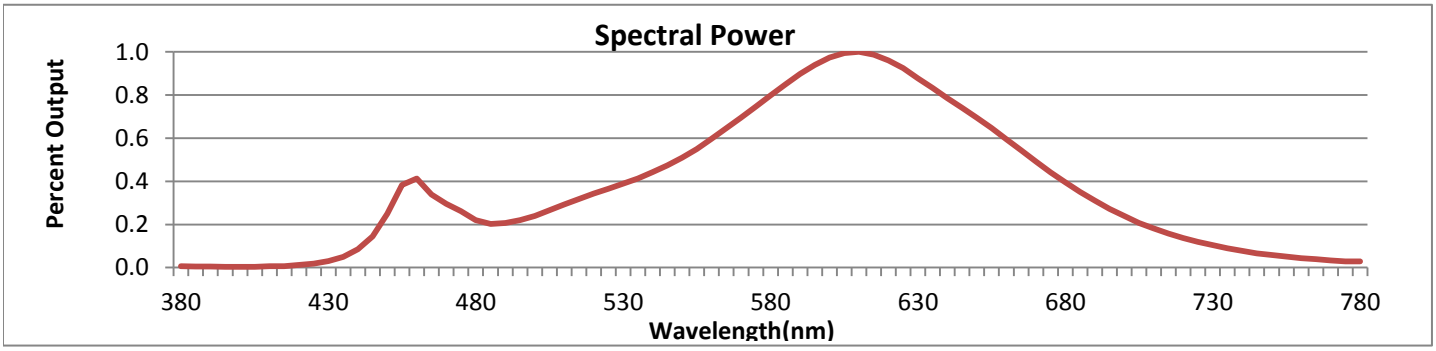
FIG. 1 LUMINAIRE

*All Results in accordance to IESNA LM-79-2008: Approved Method for the Electrical and Photometric Testing of Solid-State Lighting.

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Report No: L021702006

NVLAP TESTING
NVLAP LAB CODE 200927-0



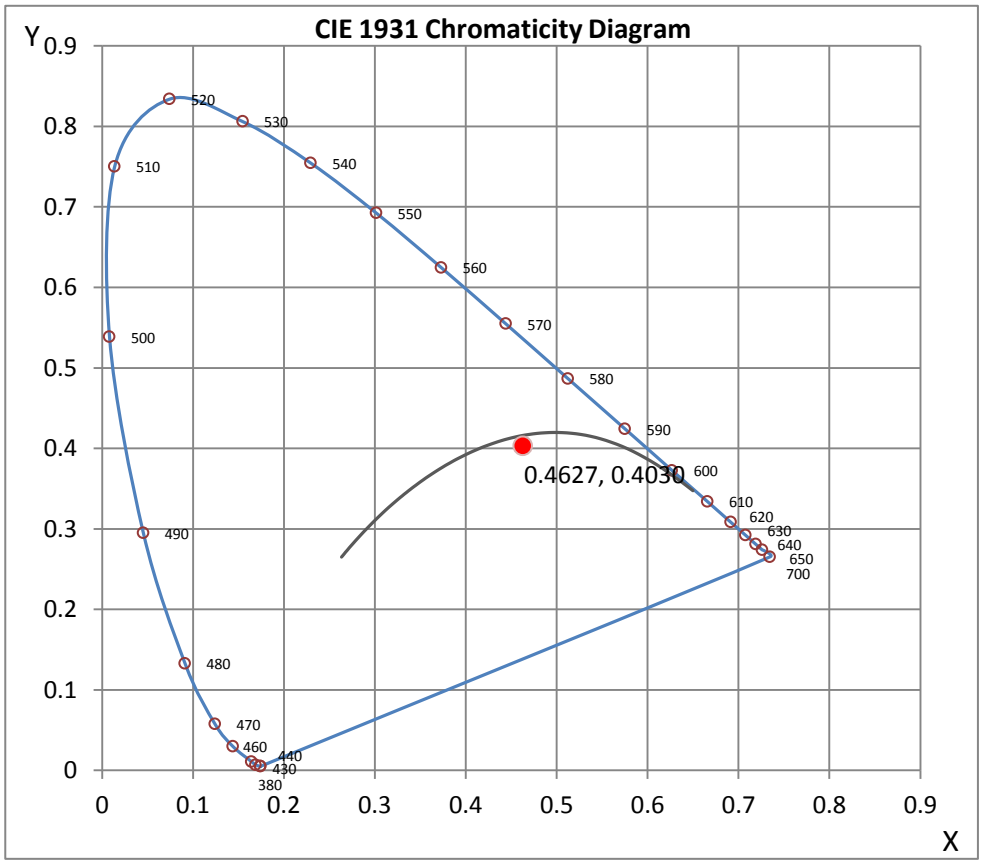
Wavelength	W/m²nm	440	0.0853	510	0.2921	580	0.7996	650	0.6948	720	0.1375
380	0.0062	450	0.2500	520	0.3435	590	0.8985	660	0.5956	730	0.1039
390	0.0045	460	0.4124	530	0.3899	600	0.9741	670	0.4913	740	0.0771
400	0.0040	470	0.2965	540	0.4420	610	1.0000	680	0.3958	750	0.0585
410	0.0061	480	0.2199	550	0.5100	620	0.9612	690	0.3105	760	0.0440
420	0.0117	490	0.2074	560	0.5974	630	0.8770	700	0.2390	770	0.0331
430	0.0305	500	0.2388	570	0.6955	640	0.7856	710	0.1814	780	0.0285

CRI & CCT

x	0.4627
y	0.4030
u'	0.2678
v'	0.5248
CRI	83.20
CCT	2602
Duv	-0.00301

R Values

R1	83.16
R2	95.25
R3	91.51
R4	78.56
R5	83.30
R6	94.40
R7	79.84
R8	59.24
R9	18.06
R10	88.97
R11	77.01
R12	79.42
R13	86.33
R14	96.24



*All Results in accordance to IESNA LM-79-2008: Approved Method for the Electrical and Photometric Testing of Solid-State Lighting.

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www.lightlaboratory.com

NVLAP TESTING
NVLAP LAB CODE 200927-0

Test Methods

Photometric Measurements - Goniophotometer

A Custom Light Laboratory Type C Rotating Mirror Goniophotometer was used to measure candelas(intensity) at each angle of distribution as defined by IESNA for the appropriate fixture type.

Ambient temperature is set to 25°C and is measured from the center of the fixture, within 1ft from the outside of the fixture. Temperature is maintained at 25°C throughout the testing process and the sample is stabilized for at least 30mins and longer as necessary for the sample to achieve stabilization.

Electrical measurements are measured using the listed equipment.

Spectral Measurements - Integrating Sphere

A Sensing Spectroradiometer SPR-3000, in conjunction with Light Laboratory 2 meter integrating sphere was used to measure chromaticity coordinates, correlated color temperature(CCT) and the color rendering index(CRI) for each sample.

Ambient temperature is set to 25°C and is measured from the center of the fixture, within 1ft from the outside of the fixture. Temperature is maintained at 25°C throughout the testing process and the sample is stabilized for at least 30mins and longer as necessary for the sample to achieve stabilization.

Electrical measurements are measured using the listed equipment.

Disclaimers:

This report must not be used by the customer to claim product certification, approval or endorsement by NVLAP, NIST or any agency of Federal Government.

Report Prepared by : Keyur Patel

Test Report Released by:

Jeff Ahn
Engineering Manager

Test Report Reviewed by:

Steve Kang
Quality Assurance

**Attached are photometric data reports. Total number of pages: 8*

*All Results in accordance to IESNA LM-79-2008: Approved Method for the Electrical and Photometric Testing of Solid-State Lighting.

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Photometric Test Report

IES FLOOD REPORT
PHOTOMETRIC FILENAME : L021702006.IES

DESCRIPTIVE INFORMATION (From Photometric File)

IESNA:LM-63-2002
[TEST] L021702006
[TESTLAB] LIGHT LABORATORY, INC.
[ISSUEDATE] 2/16/2017
[MANUFAC] HUNTER INDUSTRIES
[LUMCAT] PL-LED20W-12R-BZ
[LUMINAIRE] PL FIXTURE, 1.6W G4, 12” RISER IN BRONZE
[BALLASTCAT] N/A
[LAMPPOSITION] 0,0
[LAMPCAT] N/A
[OTHER] INDICATING THE CANDELA VALUES ARE ABSOLUTE AND
[MORE] SHOULD NOT BE FACTORED FOR DIFFERENT LAMP RATINGS.
[INPUT] 12VAC, 1.160W
[TEST PROCEDURE] IESNA:LM-79-08

Note: Candela values converted from Type-C to Type-B

CHARACTERISTICS

NEMA Type	7 H x 7 V
Maximum Candela	18.097
Maximum Candela Angle	0H 0V
Horizontal Beam Angle (50%)	46.2
Vertical Beam Angle (50%)	61.3
Horizontal Field Angle (10%)	160.8
Vertical Field Angle (10%)	169.5
Lumens Per Lamp	N.A. (absolute)
Total Lamp Lumens	N.A. (absolute)
Beam Lumens	9
Beam Efficiency	N.A.
Field Lumens	33
Field Efficiency	N.A.
Spill Lumens	0
Luminaire Lumens	34
Total Efficiency	N.A.
Total Luminaire Watts	1.16
Ballast Factor	1.00

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Calculations based on published IES Methods and recommendations, values rounded for display purposes.
Results derived from content of manufacturers photometric file.

IES FLOOD REPORT
PHOTOMETRIC FILENAME : L021702006.IES

AXIAL CANDELA

DEG.	HOR.	DEG.	VERT.
90	.105	90	.123
85	.667	85	1.668
75	3.142	75	6.917
65	3.669	65	4.231
55	4.459	55	3.862
47.5	5.319	47.5	4.521
42.5	5.899	42.5	5.126
37.5	6.575	37.5	6.144
33	7.415	33	7.935
29	8.265	29	9.817
25.5	8.806	25.5	10.505
22.5	9.111	22.5	10.594
19.5	9.425	19.5	10.648
17	9.855	17	10.964
15	10.199	15	11.217
13	10.838	13	11.695
11	11.477	11	12.172
9	12.387	9	12.832
7	13.657	7	13.78
5	15.202	5	15.044
3	17.046	3	17.116
1	18.046	1	18.029
0	18.097	0	18.097
-1	18.046	-1	18.029
-3	17.046	-3	17.116
-5	15.202	-5	15.044
-7	13.657	-7	13.78
-9	12.387	-9	12.832
-11	11.477	-11	12.172
-13	10.838	-13	11.695
-15	10.199	-15	11.217
-17	9.855	-17	10.964
-19.5	9.425	-19.5	10.648
-22.5	9.111	-22.5	10.594
-25.5	8.806	-25.5	10.505
-29	8.265	-29	9.817
-33	7.415	-33	7.935
-37.5	6.575	-37.5	6.144
-42.5	5.899	-42.5	5.126
-47.5	5.319	-47.5	4.521
-55	4.459	-55	3.862
-65	3.669	-65	4.231
-75	3.142	-75	6.917
-85	.667	-85	1.668
-90	.105	-90	.123

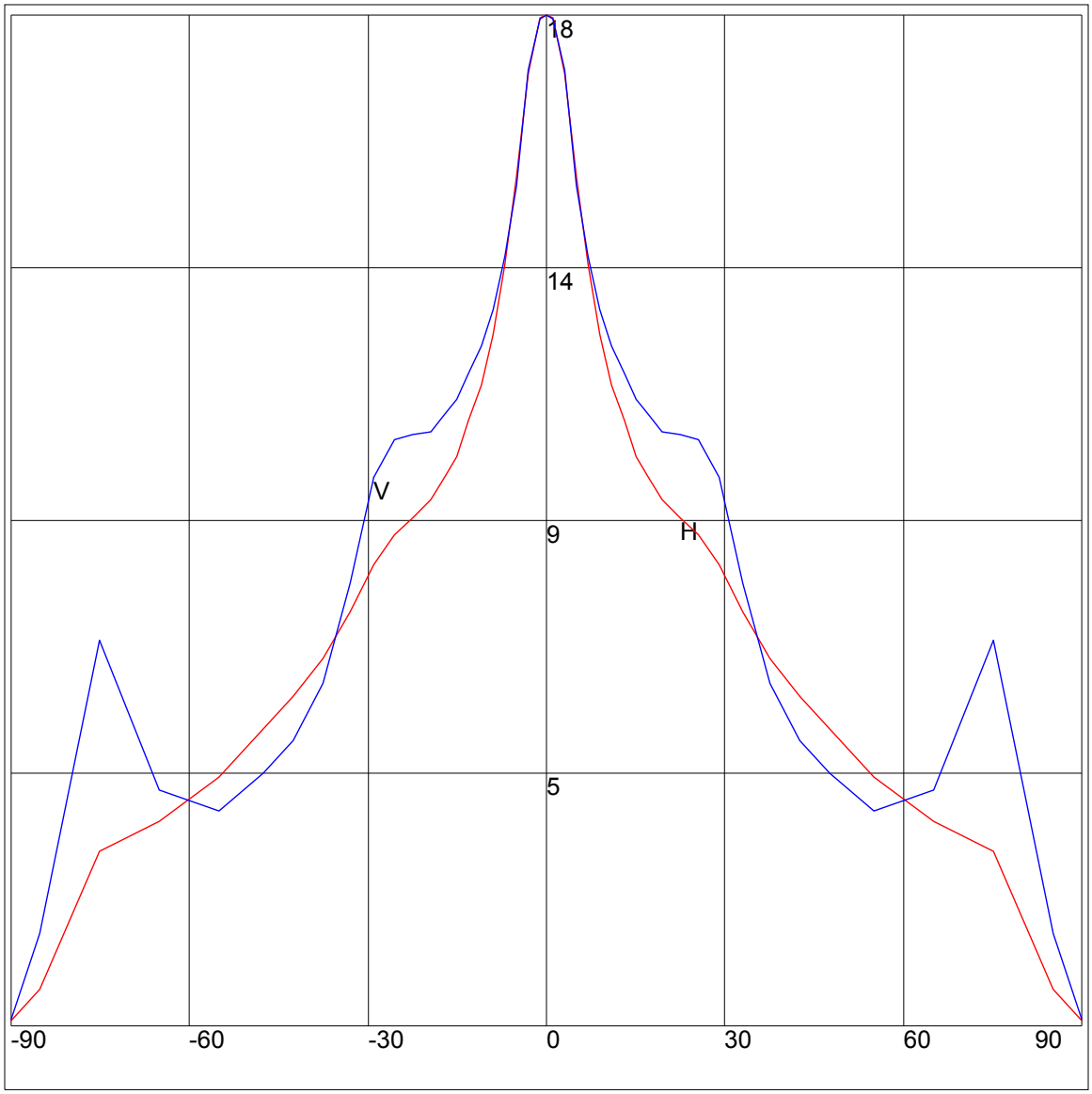
ZONAL LUMEN SUMMARY

Zone	%
0-20	13
0-30	26.6
0-40	40
0-60	63.2
0-80	94
0-90	100
10-90	96
20-40	27
20-50	38.9
40-70	35.9
60-80	30.8
70-80	18.1
80-90	6
90-110	0
90-120	0
90-130	0
90-150	0
90-180	0
110-180	0
0-180	100

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Results derived from content of manufacturers photometric file.

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AXIAL CANDELA DISPLAY

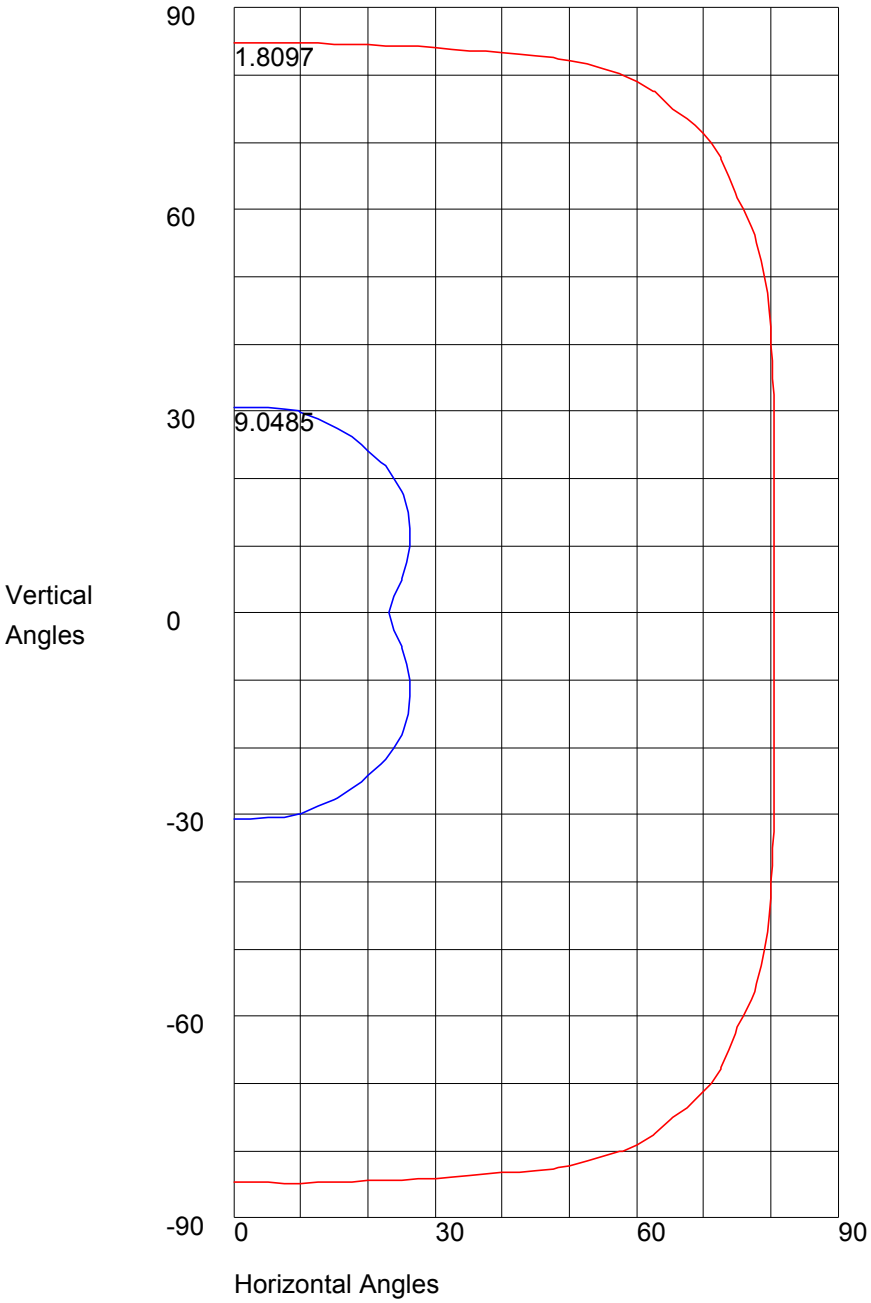


Maximum Candela = 18.097 Located At Horizontal Angle = 0, Vertical Angle = 0
H - Horizontal Axial Candela
V - Vertical Axial Candela

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ISOCANDELA CURVES



Maximum Candela = 18.097 Located At Horizontal Angle = 0, Vertical Angle = 0
50% Maximum Candela = 9.0485
10% Maximum Candela = 1.8097

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