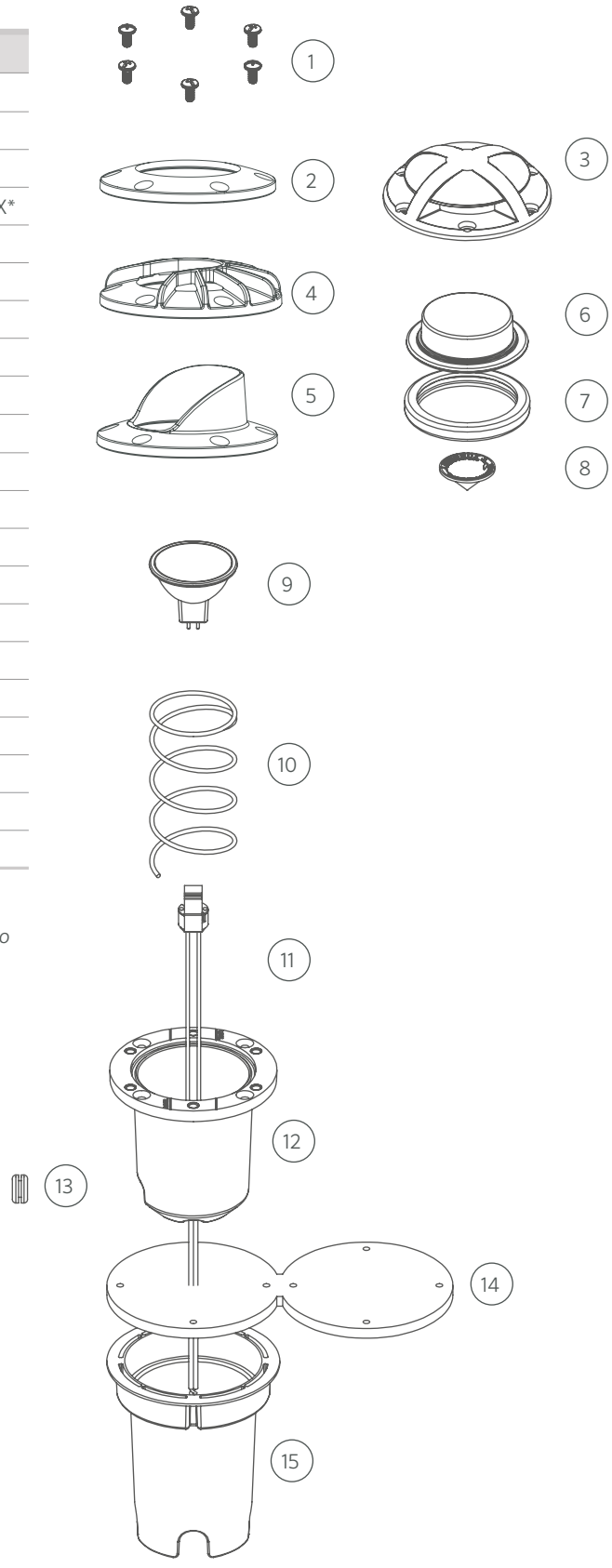
Replacement Parts

ITEM	DESCRIPTION		PART #
1	Screw, #10-24 x ⅜"		250015870000
2	Faceplate	Metal Ring	FC-FP-RG-XX*
		Camo Bronze Ring	250014330000
3		Brass Ground Wash	FC-FP-GW-ZZZ*-XX*
4		Brass Louver	FC-FP-LV-XX*
		Camo Bronze Louver	250014320000
5		Brass Cowling	FC-FP-CW-XX*
		Camo Bronze Cowling	250014310000
6	Lens	Clear	250014240000
		Frosted	250014240001
7	Lens Seal		250014250000
8	Upper Reflector		771000
9	Lamp, MR-16		See Lamp Chart
10	Spring		†
11	Socket Assembly		†
12	Inner Housing		†
13	Grommet		†
14	Construction Cover		250026950000
15	Outer Housing		250014260000
14-15	Mounting Kit		FC-SLEEVE-ASSY
16	Screw, #16 x 1½"		250013060000‡

** XX = Finish code*
**ZZZ = Orientation code (090, 180, 270, 360)*
† This part is not serviceable. Contact Customer Support or a local distributor to order a complete product.
‡ Not shown in diagram



MR-16 LED Lamp Chart

LUMENS / VA	CCT	BEAM ANGLE	PART #
272 lm / 4.2 VA	2700K	10° Very Narrow	MR16-LED-20-W-VN
247 lm / 4.2 VA	2700K	35° Flood	MR16-LED-20-W-FL
238 lm / 4.2 VA	2700K	60° Wide Flood	MR16-LED-20-W-WF
458 lm / 5.3 VA	2700K	10° Very Narrow	MR16-LED-35-W-VN
394 lm / 5.3 VA	2700K	35° Flood	MR16-LED-35-W-FL
310 lm / 5.3 VA	2700K	60° Wide Flood	MR16-LED-35-W-WF
447 lm / 6.5 VA	2700K	35° Flood	MR16-LED-50-W-FL
287 lm / 4.2 VA	3000K	10° Very Narrow	MR16-LED-20-S-VN
238 lm / 4.2 VA	3000K	35° Flood	MR16-LED-20-S-FL
242 lm / 4.2 VA	3000K	60° Wide Flood	MR16-LED-20-S-WF
458 lm / 5.3 VA	3000K	10° Very Narrow	MR16-LED-35-S-VN
394 lm / 5.3 VA	3000K	35° Flood	MR16-LED-35-S-FL
380 lm / 5.3 VA	3000K	60° Wide Flood	MR16-LED-35-S-WF
505 lm / 6.5 VA	3000K	35° Flood	MR16-LED-50-S-FL
287 lm / 4.2 VA	3900K	10° Very Narrow	MR16-LED-20-C-VN
288 lm / 4.2 VA	3900K	35° Flood	MR16-LED-20-C-FL
290 lm / 4.2 VA	3900K	60° Wide Flood	MR16-LED-20-C-WF
365 lm / 5.3 VA	3900K	10° Very Narrow	MR16-LED-35-C-VN
340 lm / 5.3 VA	3900K	35° Flood	MR16-LED-35-C-FL
350 lm / 5.3 VA	3900K	60° Wide Flood	MR16-LED-35-C-WF
464 lm / 6.5 VA	3900K	35° Flood	MR16-LED-50-C-FL

MR-16 ZD LED Lamp Chart

LUMENS / VA	CCT	BEAM ANGLE	PART #
458 lm / 5.3 VA	2700K	10° Very Narrow	MR16-ZD-35-W-VN
394 lm / 5.3 VA	2700K	35° Flood	MR16-ZD-35-W-FL
310 lm / 5.3 VA	2700K	60° Wide Flood	MR16-ZD-35-W-WF
447 lm / 6.5 VA	2700K	35° Flood	MR16-ZD-50-W-FL
458 lm / 5.3 VA	3000K	10° Very Narrow	MR16-ZD-35-S-VN
394 lm / 5.3 VA	3000K	35° Flood	MR16-ZD-35-S-FL
380 lm / 5.3 VA	3000K	60° Wide Flood	MR16-ZD-35-S-WF
505 lm / 6.5 VA	3000K	35° Flood	MR16-ZD-50-S-FL
365 lm / 5.3 VA	3900K	10° Very Narrow	MR16-ZD-35-C-VN
340 lm / 5.3 VA	3900K	35° Flood	MR16-ZD-35-C-FL
350 lm / 5.3 VA	3900K	60° Wide Flood	MR16-ZD-35-C-WF
464 lm / 6.5 VA	3900K	35° Flood	MR16-ZD-50-C-FL

MR-16 Eco LED Lamp Chart

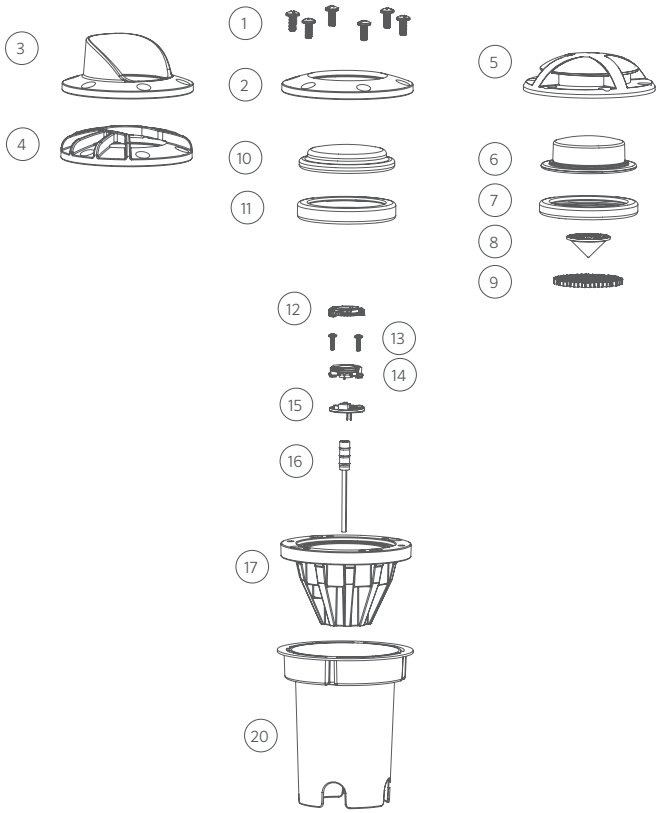
LUMENS / VA	CCT	BEAM ANGLE	PART #
320 lm / 6.2 VA	2700K	35° Flood	MR16-ECO-20-W-FL
309 lm / 6.2 VA	2700K	60° Wide Flood	MR16-ECO-20-W-WF
465 lm / 9.2 VA	2700K	35° Flood	MR16-ECO-50-W-FL
430 lm / 9.2 VA	2700K	60° Wide Flood	MR16-ECO-50-W-WF

fxl.com/**MR-16**

Replacement Parts

ITEM	DESCRIPTION		PART #
1	Screw, #10-24 x ⅜"		250015870000
2	Faceplate	Ring	FC-FP-RG-XX*-
3		Cowling	FC-FP-CW-XX*
4		Louver	FC-FP-LV-XX*
5		Ground Wash	FC-FP-GW-ZZZ*-XX*
6	Lens, Ground Wash		250021960000
7	Seal, Ground Wash		250021970000
8	Upper Reflector		771000
9	Hex Baffle, 2" (50 mm)		250015260000
10	Lens	Clear	250014240000
		Frosted	250014240001
11	Seal, Ring/Cowling/Louver		250014250000
12	Beam Angle Lens		See LED Chart
13	Screw		See LED Chart
14	Reflector		See LED Chart
15	LED Board		See LED Chart
16	Socket, 10' (3 m)		†
17	Body		†
18‡	Screw, #6 x 1½" (Qty. 4)		250013060000
19‡	Construction Cover		250026950000
20	Outer Housing		250014260000
18-20	Mounting Kit		FCSLEEVEASSY

** XX = Finish code*
** ZZZ = Orientation code (090, 180, 270, 360)*
† This part is not serviceable. Contact Customer Support or a local distributor to order a new product.
‡ Not shown in diagram



2nd Gen LED Chart

DESCRIPTION	PART #
LED Replacement Kits (Board, Reflector, Screws, Beam Angle Lenses)	
1 LED Up Light Kit (2700K)	KIT-1LED-RD-W
3 LED Up Light Kit (2700K)	KIT-3LED-RD-W
6 LED Up Light Kit (2700K)	KIT-6LED-RD-W
9 LED Up Light Kit (2700K)	KIT-9LED-RD-W
ZD 1 LED Up Light Kit (2700K)	KIT-ZD-1LED-RD-W
ZD 3 LED Up Light Kit (2700K)	KIT-ZD-3LED-RD-W
ZD 6 LED Up Light Kit (2700K)	KIT-ZD-6LED-RD-W
ZD 9 LED Up Light Kit (2700K)	KIT-ZD-9LED-RD-W
ZDC 3 LED Kit, Medium	ZDC-KITM
ZDC 3 LED Kit, Large	ZDC-KITL
Reflectors	
1 LED Reflector	770000
3 LED Reflector	770700
6 LED/9 LED Reflector	771400
ZDC 3 LED Reflector, Medium	250022050000
ZDC 3 LED Reflector, Large	250020690000
Screws	
1 LED/3 LED Screw, #4-40 x ⅜" (Qty Req: 2)	762400
6 LED/9 LED Screw, #4-40 x 7⁄16" (Qty Req: 3)	250014550000

Beam Angle Lens Chart

DESCRIPTION	PART #
Round Beam Angle Lenses	
1 LED Spot Lens (20°)	770600
1 LED Flood Lens (35°)	1LED-FL-LENS
1 LED Wide Flood Lens (60°)	1LED-WFL-LENS
3 LED Spot Lens (20°)	771300
3 LED Flood Lens (35°)	3LED-FL-LENS
3 LED Wide Flood Lens (60°)	3LED-WFL-LENS
6 LED/9 LED Spot Lens (20°)	771600
6 LED/9 LED Flood Lens (35°)	9LED-FL-LENS
6 LED/9 LED Wide Flood Lens (60°)	9LED-WFL-LENS

1st Gen LED Chart

DESCRIPTION	PART #
LED Replacement Kits (Board, Color Filters, Reflector, Screws)	
1 LED Up Light Kit (3900K)	1LED-UL-KIT
3 LED Up Light Kit (3900K)	3LED-UL-KIT
6 LED Up Light Kit (3900K)	6LED-UL-KIT
9 LED Up Light Kit (3900K)	9LED-UL-KIT
ZD 1 LED Up Light Kit (3900K)	ZD-1LED-UL-KIT
ZD 3 LED Up Light Kit (3900K)	ZD-3LED-UL-KIT
ZD 3 LED T Up Light Kit (TURTLE)	ZD-3LED-T-KIT
ZD 6 LED Up Light Kit (3900K)	ZD-6LED-UL-KIT
ZD 9 LED Up Light Kit (3900K)	ZD-9LED-UL-KIT
Color Filter Lenses Only	
1 LED Color Filter, Amber	770100
1 LED Color Filter, Blue	770101
1 LED Color Filter, Green	770102
3 LED Color Filter, Amber	770800
3 LED Color Filter, Blue	770801
3 LED Color Filter, Green	770802
6 LED/9 LED Color Filter, Amber	771500
6 LED/9 LED Color Filter, Blue	771501
6 LED/9 LED Color Filter, Green	771502
Optics Kits (Color Filters, Reflector, Screws)	
1 LED Optics Kit	1LED-OPTICS-KIT
3 LED Optics Kit	3LED-OPTICS-KIT
6 LED/9 LED Optics Kit	9LED-OPTICS-KIT



PROJECT

CATALOG #

TYPE

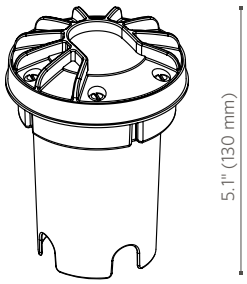
NOTES

FC Well Light STANDARD PREMIUM

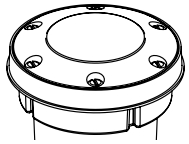
The subterranean FC well light provides controlled, glare-free illumination for smaller-scale spaces. Its compact size is perfect for discreet up lighting applications.

Quick Facts

- Die-cast brass or composite construction
- Compatible with Luxor® technology
- MR-16 lamp type
- Input voltage: 10-15V

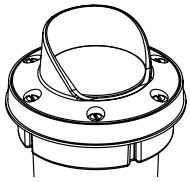


FC-LV



FC-RG

Height: 4.8" (122 mm)



FC-CW

Height: 6.8" (173 mm)

FC Well Light SPECIFICATIONS

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 used to create elegant landscape lighting systems for commercial or residential applications. Our products are available exclusively via our extensive professional distributor network.

Materials
Die-cast C360 brass or composite PBT faceplate. Black oxide stainless steel setscrews and PBT construction sleeve.

Wiring
18 AWG (1 mm); SPT-1W; 220°F (105°C); 300V; 10' (3 m) length

Weight
2.4 lbs (1.1 kg)

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

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

Lamp
GU5.3 lamp base. Preinstalled LED MR-16 with Cree® LEDs offers a warm 2,700K color temperature with a minimum rated life (L70) 40,000 hours.

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

Housing
PPS and PBT composite housing with capacity for MR-16 lamps.

Installation Requirements
Designed for recessed installation in the upward direction only.

Warranty
10-year limited warranty on luminaire; 5-year limited warranty on preinstalled FX lamps.

Manufacturing
9001:2015 ISO certified facility

Faceplate
Die-cast C360 brass or composite faceplate with features for protection, glare control, and optimal beam pattern.

Lens
RG, CW, or LV: Tempered glass lens with shock resistance and high tolerance for thermal expansion and stress.

Finish
Options of brass in natural or nickel plate finish or PBT composite in Desert Tan or Camo Bronze.

Hardware
Includes six black oxide stainless steel faceplate screws and two gold tamper-resistant wood screws to secure housing to construction sleeve.

Control
Luxor zoning and dimming technology with use of Luxor Cube (LCM-LV). Luxor technology allows up to 250 groups, dimmable in 1% increments between 0 and 100%.

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.

International Compliance
Compliant per IEC 60598-1 and IEC 60598-2-7 by selecting the “e” version in parts builder.

Listings
c UL us LISTED 3YJ8 RoHS COMPLIANT CE

FC Well Light ORDERING INFORMATION

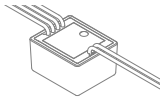
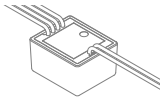
Fixture	Lamp	Compliance	Faceplate	Finish
FC*	**NL** *No Lamp*	**[default]** *UL Listed*	**RG** *Ring*	**BS** *Natural Brass*
	LED20WWF	**e** *CE Certified*	**LV** *Louver*	**NP** *Nickel Plate*
	LED20WFL *20E Eq., 4W, 4.3VA, 2,700K, 35°*		**CW** *Cowling*	**CB** *Camo Bronze*
	LED35WFL *35W Eq., 5W, 5.4VA, 2,700K, 35°*			**DT** *Desert Tan*
	ZD35WFL *35W Eq., 5W, 5.4VA, 2,700K, 35°*			

EXAMPLE FIXTURE CONFIGURATION:
FC-LED20WFL-CW-CB

FC - [ ] - [ ] - [ ] - [ ]

*Includes Construction Sleeve (250014350000)

LUXOR® TECHNOLOGY OPTIONS: Specify Separately

Cubes	Code	
LOW-VOLTAGE CUBE *Supports AC dimmable LEDs and incandescent: MAX LOAD: 60W/5A*	LCM-LV	
RELAY/0-10V CUBE *Supports relay switch: MAX LOAD: 250VAC/5A*	LCM-RLY-010V	

Cree is a registered trademark of Cree Inc. MoistureBlock is a trademark of DSM&T Co. Inc.

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Lamp Chart

LAMP		COMMENTS	WATTAGE	BEAM ANGLE	FOR USE WITH
	Halogen MR-8	2,000 Average Life Hour	20	Wide	CG
			20N	Narrow	CG
	Halogen MR-11	2,000 Average Life Hour	10	Wide	SM
			20	Wide	FC, MP, SM
			35	Wide	CL, TS, SM
	Halogen MR-16	5,000 Average Life Hour 10,000 Hour option available (for fixtures using 20/35/50 Watt)	20	Wide	LO, LR, MU, RP, RS, TE
			20V	Very Narrow	LO, LR, MU, RP, RS, TE
			35	Wide	LO, LR, MU, RP, RS, TE
			50	Wide	LO, LR, MU, RP, TE
			35V	Very Narrow	LO, LR, MU, RP, RS, TE
			50N	Narrow	LO, LR, MU, RP, TE
			50V	Very Narrow	LO, LR, MU, RP, TE
	Titan Halogen MR-16	12,000 Average Life Hour (for fixtures using 20 Watt) 18,000 Average Life Hour (for fixtures using 35/50 Watt)	20	Wide	LB
			35	Wide	LB
			50	Wide	LB
	Xenon G4	10,000 Average Life Hour (for fixtures using 10/15 Watt) 5,000 Average Life Hour (for fixtures using 20 Watt)	10	N/A	BD, CA, CB, CM,CP, CR, CV, DL, DM, DP, DR, DS, EA, GT, MM, PF, PR, PV, QF, SC, SP, RL, UN
			15	N/A	BD, CA, CB, CV, DL, DM, DR, DS, EA, PF, PR, QF, SC, SP
			20	N/A	BD, CA, CB, CM, CR, CV, DL, DM, DR, DS, EA, GN, GT, LM, PD, PF, PR, QF, RL, SC, SP
	Halogen T3	2,000 Average Life Hour	5	N/A	SI
			10	N/A	BD, CA, CB, CR, CV, DL, DM, DP, DR, DS, EA, GT, MM, PF, PR, PV, QF, RL, SC, SI, SP,
			20	N/A	BD, CA, CB, CR, CV, DL, DM, DR, DS EA, GT, PF, PR, QF, RL, SC, SI, SP,
			35	N/A	GN, GT, RL, SI
	Halogen AR-11	2,000 Average Life Hour	20	Wide	CL, ML, TC, TS, VL
			20N	Narrow	CL, PM, TC, TS, VL
			20V	Very Narrow	CL, TC, TS, VL
	Halogen AR-20	2,000 Average Life Hour	50	Wide	TS
			50N	Narrow	TS
	Incandescent 93	900 Average Life Hour	12	N/A	AL, FG, LS, TD
	Incandescent 1141	1,200 Average Life Hour	18	N/A	AL, FG, TD
	Incandescent 1156	1,200 Average Life Hour	25	N/A	AL, FG, TD
	Halogen PAR36	4,000 Average Life Hour	20	Wide	CF
			35	Wide	CF

BEAM ANGLE KEY (APPROXIMATE VALUES)			
Very Narrow: 10°	Narrow: 25°	Wide: 40°	Very Wide: 60°

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

Report No: L101410418
Date: 11/18/2014

NVLAP LAB CODE 200927-0

Report No: **L101410418**

Report Prepared For: Hunter Industries
1840 La Costa Meadows Dr, San Marcos, CA. 92078

Model Number: **FCZDC3LEDRGBZ**

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 FCZDC3LEDRGBZ . Received in working and undamaged condition. No modifications were necessary.

Testing Condition: Fixture is tested with no special conditions.

Sample Arrival Date: 11/7/14

Date of Tests: 11/18/14 - 11/18/14

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	01/04/15
Xitron Power Analysis System	2503AH	MT-EL01	01/09/15
BK Precision DC Power Supply	1747	PSDC-04	01/08/15
Fluke Digital Thermometer	52k/J	MT-TP02-GC	01/04/15
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
Model Number:	FCZDC3LEDRGBZ
Driver Model Number:	N/A
Total Lumens:	216.12
Input Voltage (VAC/60Hz):	12.00
Input Current (Amp):	0.47
Input Power (W):	5.22
Input Power Factor:	0.93
Current ATHD @ 12V(%):	38%
Current ATHD @ 277V(%):	N/A
Efficacy:	41
Color Rendering Index (CRI):	83
Correlated Color Temperature (K):	3884
Chromaticity Coordinate x:	0.3860
Chromaticity Coordinate y:	0.3809
Ambient Temperature (°F):	77.0
Stabilization Time (Hours):	1:00
Total Operating Time (Hours):	2:00
Off State Power(W):	0.00

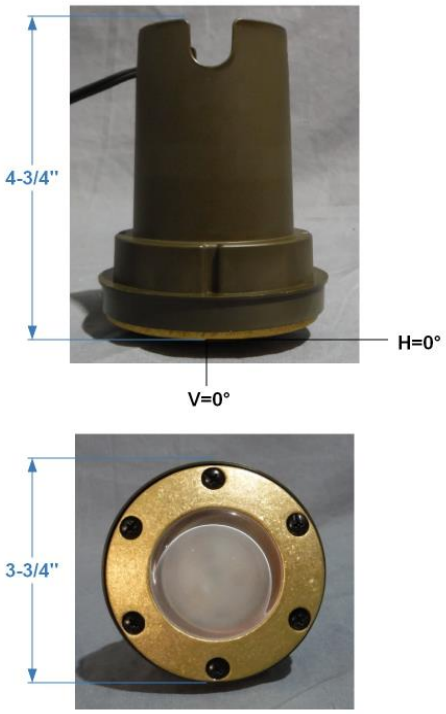


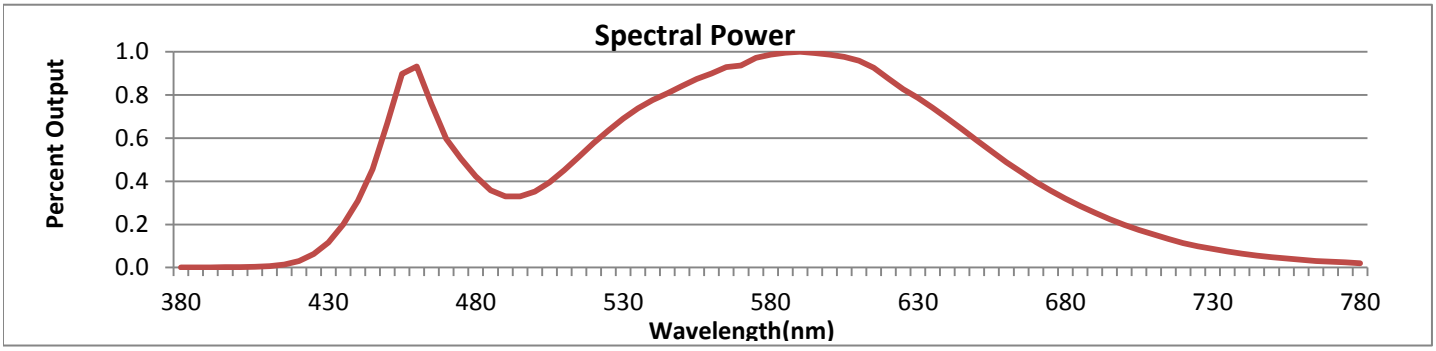
FIG. 1 LUMINAIRE

*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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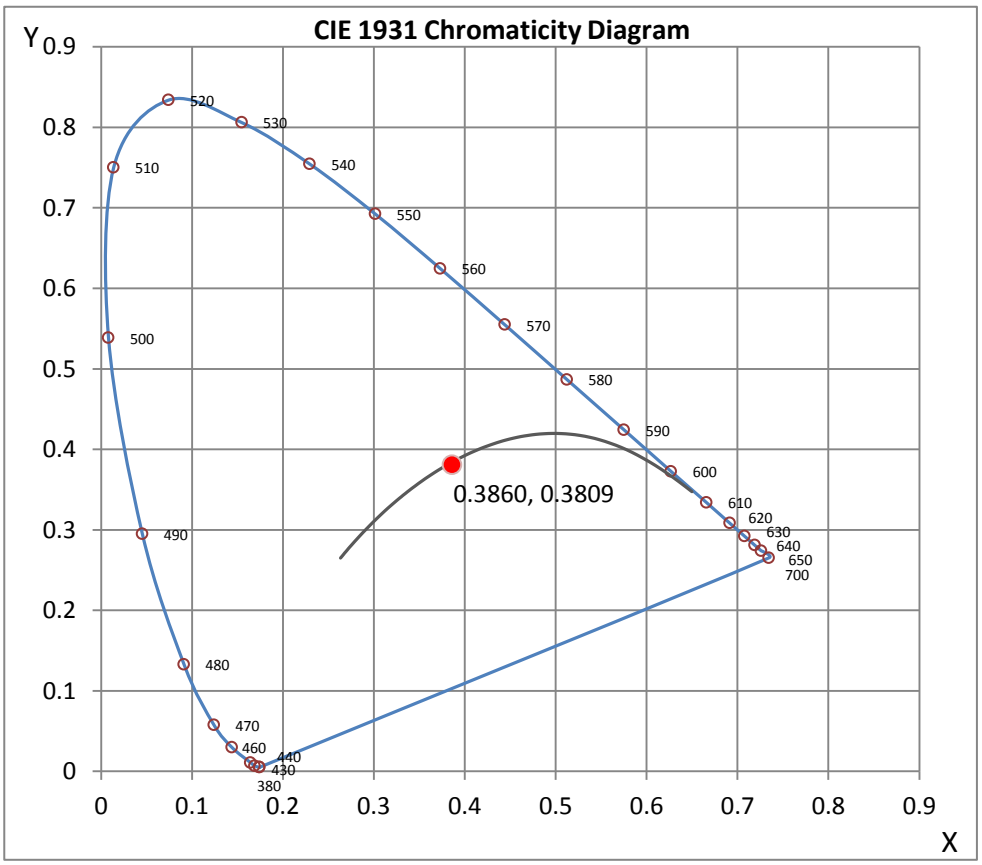
Wavelength	W/m²nm	440	0.3088	510	0.4523	580	0.9880	650	0.5893	720	0.1138
380	0.0011	450	0.6705	520	0.5780	590	1.0000	660	0.4887	730	0.0862
390	0.0011	460	0.9322	530	0.6900	600	0.9880	670	0.3964	740	0.0647
400	0.0019	470	0.5972	540	0.7764	610	0.9591	680	0.3190	750	0.0484
410	0.0062	480	0.4237	550	0.8423	620	0.8763	690	0.2536	760	0.0359
420	0.0299	490	0.3306	560	0.9001	630	0.7868	700	0.1982	770	0.0271
430	0.1169	500	0.3516	570	0.9361	640	0.6917	710	0.1533	780	0.0205

CRI & CCT

x	0.3860
y	0.3809
u'	0.2271
v'	0.5042
CRI	82.80
CCT	3884
Duv	0.00035

R Values

R1	81.46
R2	90.75
R3	94.91
R4	77.87
R5	79.49
R6	84.83
R7	86.47
R8	67.00
R9	18.60
R10	74.99
R11	73.35
R12	58.33
R13	83.95
R14	96.86



*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.

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

Photometric Test Report

IES FLOOD REPORT
PHOTOMETRIC FILENAME : L101410418.IES

DESCRIPTIVE INFORMATION (From Photometric File)

IESNA:LM-63-2002
[TEST] L101410418
[TESTLAB] LIGHT LABORATORY, INC.
[ISSUEDATE] 11/18/2014
[MANUFAC] HUNTER INDUSTRIES
[LUMCAT] FCZDC3LEDRGBZ
[LUMINAIRE] 3-3/4"DIA. X 4-3/4"H. LED FIXTURE
[MORE] DIFFUSED LENS
[BALLASTCAT] N.A.
[BALLAST] 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, 5.22W
[_TEST PROCEDURE] IESNA:LM-79-08

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

CHARACTERISTICS

NEMA Type	5 H x 5 V
Maximum Candela	282.81
Maximum Candela Angle	0H 0V
Horizontal Beam Angle (50%)	43.2
Vertical Beam Angle (50%)	43.2
Horizontal Field Angle (10%)	89.1
Vertical Field Angle (10%)	89.1
Lumens Per Lamp	N.A. (absolute)
Total Lamp Lumens	N.A. (absolute)
Beam Lumens	89
Beam Efficiency	N.A.
Field Lumens	181
Field Efficiency	N.A.
Spill Lumens	35
Luminaire Lumens	216
Total Efficiency	N.A.
Total Luminaire Watts	5.22
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 : L101410418.IES

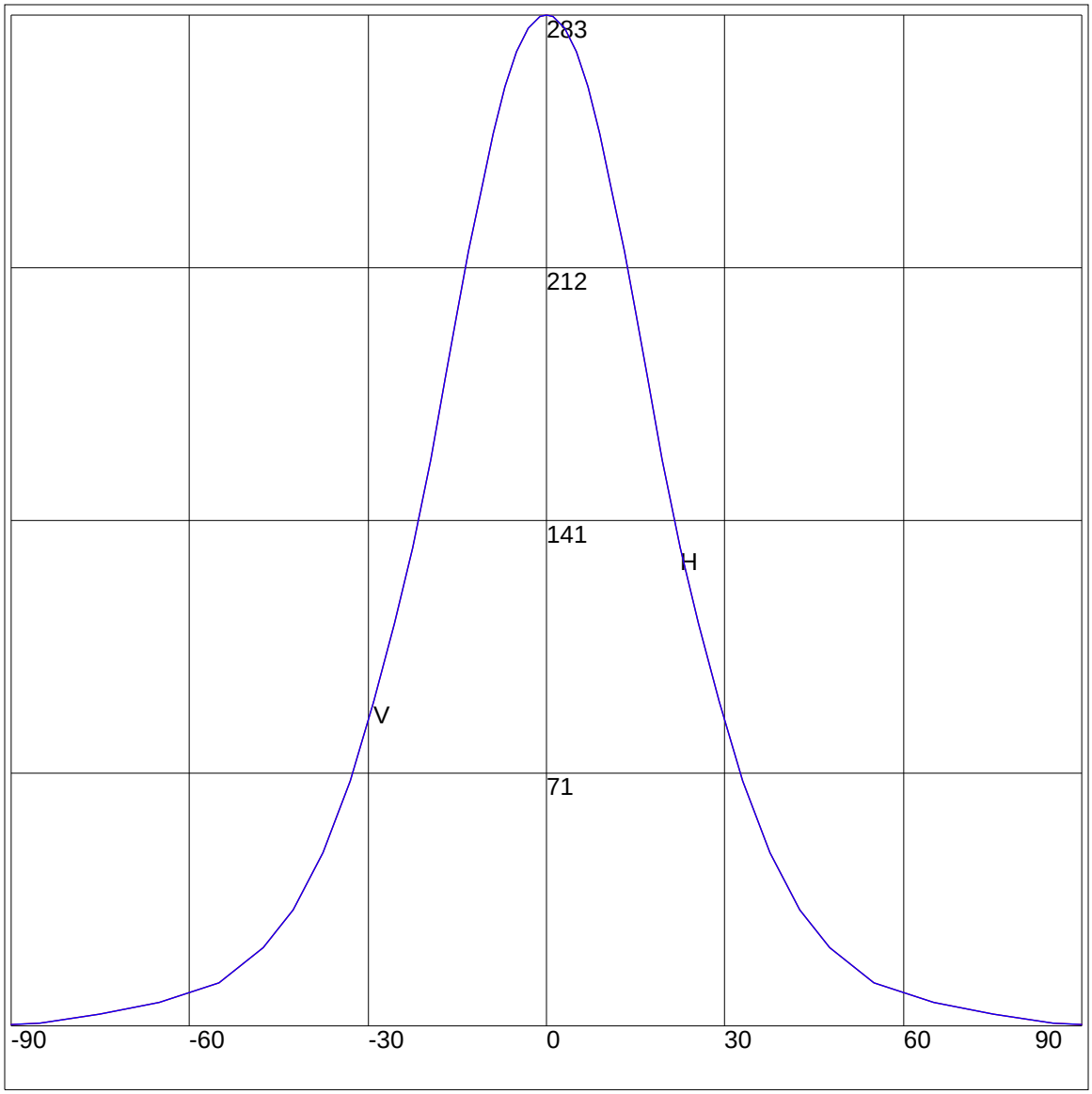
AXIAL CANDELA

DEG.	HOR.	DEG.	VERT.
90	.43	90	.43
85	1.01	85	1.01
75	3.36	75	3.36
65	6.59	65	6.59
55	12.25	55	12.25
47.5	21.94	47.5	21.94
42.5	32.71	42.5	32.71
37.5	48.63	37.5	48.63
33	68.55	33	68.55
29	91	29	91
25.5	112.54	25.5	112.54
22.5	133.79	22.5	133.79
19.5	158.78	19.5	158.78
17	181.18	17	181.18
15	199.1	15	199.1
13	216.82	13	216.82
11	233.92	11	233.92
9	249.81	9	249.81
7	262.82	7	262.82
5	272.51	5	272.51
3	279.16	3	279.16
1	282.52	1	282.52
0	282.81	0	282.81
-1	282.52	-1	282.52
-3	279.16	-3	279.16
-5	272.51	-5	272.51
-7	262.82	-7	262.82
-9	249.81	-9	249.81
-11	233.92	-11	233.92
-13	216.82	-13	216.82
-15	199.1	-15	199.1
-17	181.18	-17	181.18
-19.5	158.78	-19.5	158.78
-22.5	133.79	-22.5	133.79
-25.5	112.54	-25.5	112.54
-29	91	-29	91
-33	68.55	-33	68.55
-37.5	48.63	-37.5	48.63
-42.5	32.71	-42.5	32.71
-47.5	21.94	-47.5	21.94
-55	12.25	-55	12.25
-65	6.59	-65	6.59
-75	3.36	-75	3.36
-85	1.01	-85	1.01
-90	.43	-90	.43

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Results derived from content of manufacturers photometric file.

IES FLOOD REPORT
PHOTOMETRIC FILENAME : L101410418.IES

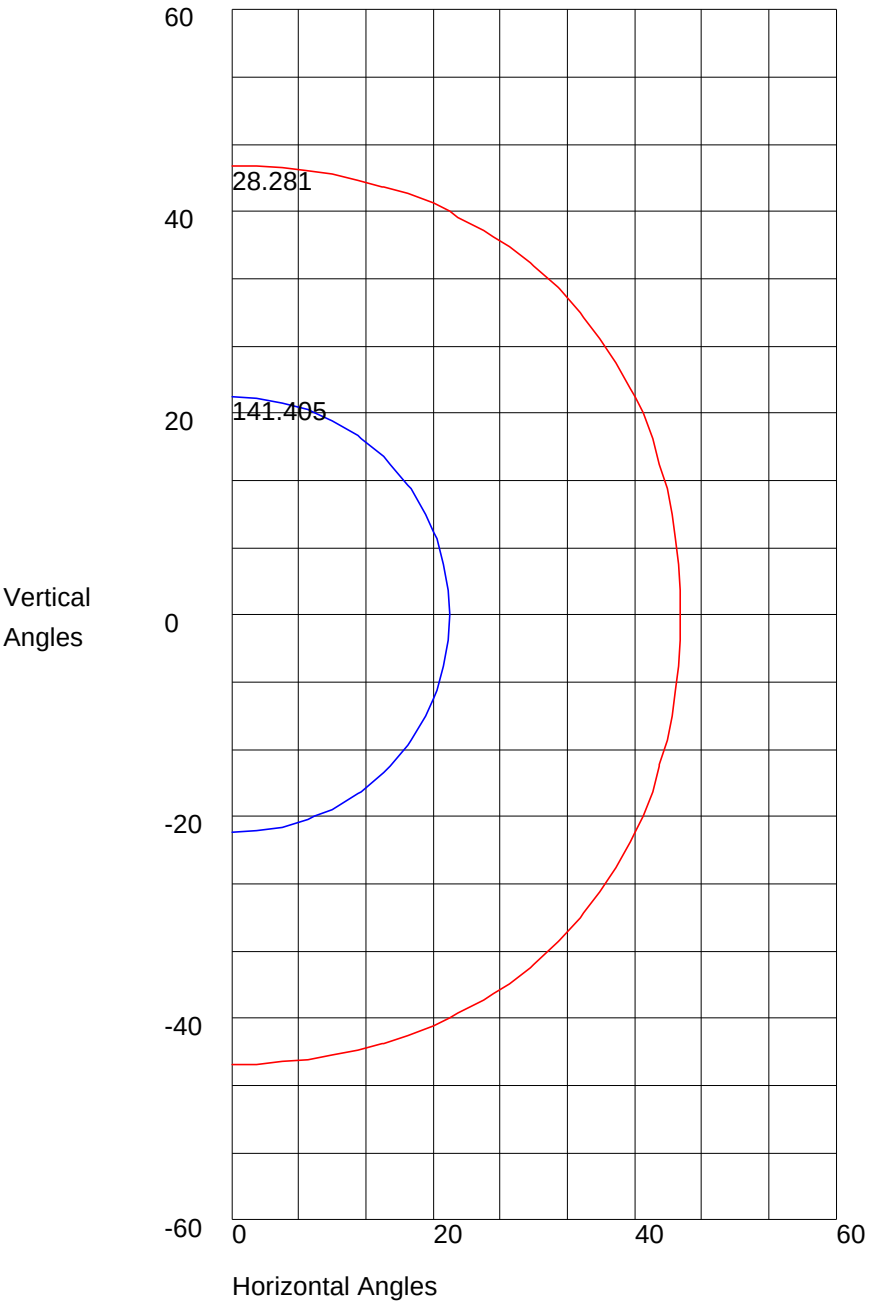
AXIAL CANDELA DISPLAY



Maximum Candela = 282.81 Located At Horizontal Angle = 0, Vertical Angle = 0
H - Horizontal Axial Candela
V - Vertical Axial Candela

IES FLOOD REPORT
PHOTOMETRIC FILENAME : L101410418.IES

ISOCANDELA CURVES



Maximum Candela = 282.81 Located At Horizontal Angle = 0, Vertical Angle = 0
50% Maximum Candela = 141.405
10% Maximum Candela = 28.281

LIGHT LABORATORY INC.
8165 E Kaiser Blvd. Anaheim, CA 92808
www.lightlaboratory.com

NVLAP TESTING
NVLAP LAB CODE 200927-0

Report No: L062310801

Issue Date: 6/21/2023
Reference:N/A
Amendment:N/A

Report Prepared For: FX Luminaire / Lumascape
1940 Diamond Street San Marcos, CA 92078

Model Number: FC-LED20WFL-GW-360-FW

Test: Photometric/Colorimetric/Electrical Test

Standards Used: Appropriate part or all test guidelines were used for test performed:

IESNA LM79: 2019 Approved Methods for Electrical and Photometric Measurements of Solid-State Lighting Products

ANSI NEMA ANSLG C78.377: 2017 Specification of the Chromaticity of Solid State Lighting Products

ANSI C82.77-10:2014: 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.

Special Test Condition: Fixture is tested with no special conditions.

Date of Tests: 6/20/23

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-S4	4/7/25
HP Power Supply	6032A	PS-DC05-S2	--
Fluke Digital Thermometer	52K/J	MT-TP05	1/11/2024
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

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www.lightlaboratory.com

NVLAP TESTING
NVLAP LAB CODE 200927-0

General Information	
Manufacturer:	FX Luminaire / Lumascape
Model Number:	FC-LED20WFL-GW-360-FW
Driver Model Number:	N/A

Test Summary	
Total Lumens:	10.00
Efficacy:	3.49
Color Redering Index:	94.1
Correlated Color Temperature:	2636
Input Voltage (VAC/60Hz):	12.00
Input Current (Amp):	0.2573
Input Power (W):	2.87
Input Power Factor:	0.9279
Current ATHD (%):	36.1%

Test Condition	
Ambient Temperature (°C):	25.0
Stabilization Time (Hours):	1:25
Total Operating Time (Hours):	2:05

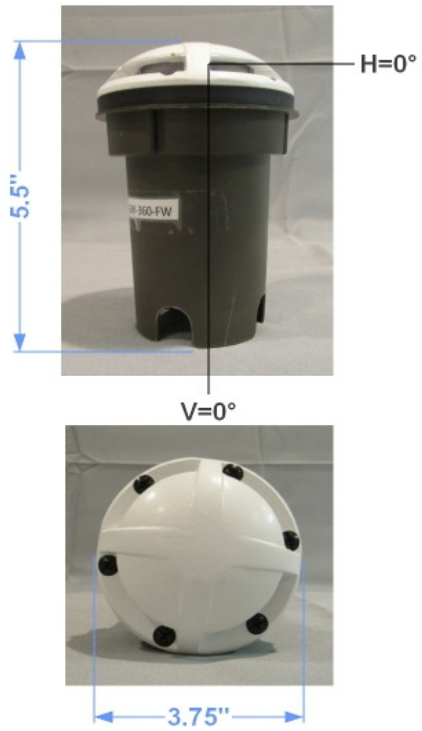
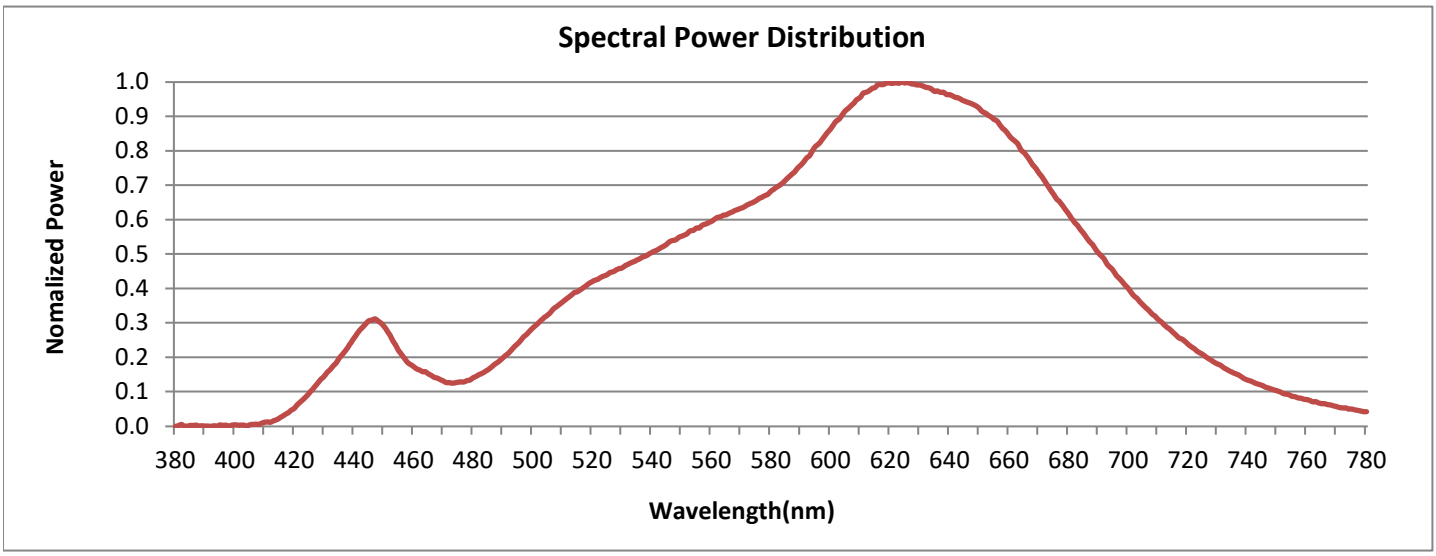


FIG. 1 LUMINAIRE

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NVLAP TESTING
NVLAP LAB CODE 200927-0

Colorimetry Test Results

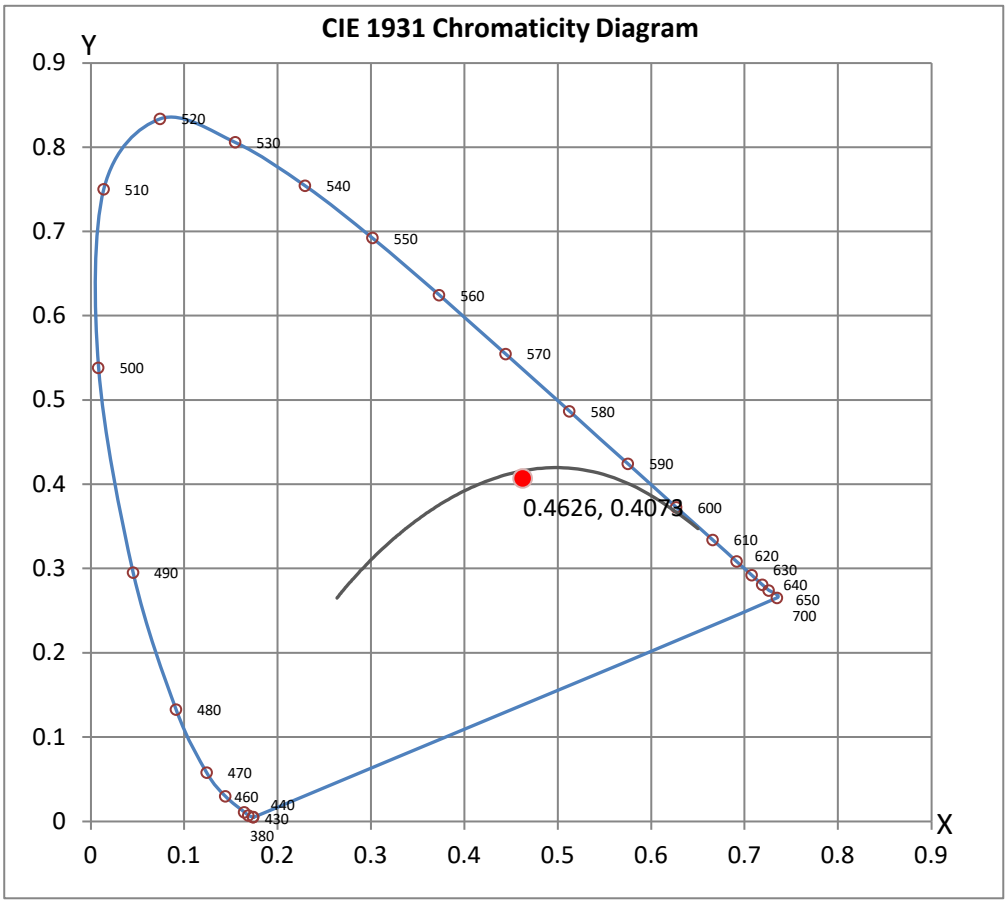


CRI & CCT

x	0.4626
y	0.4073
u'	0.2658
v'	0.5265
CRI	94.10
CCT	2636
Duv	-0.00142

R Values

R1	95.51
R2	96.18
R3	95.16
R4	94.72
R5	95.17
R6	96.40
R7	93.28
R8	86.19
R9	69.54
R10	90.20
R11	95.52
R12	90.52
R13	95.66
R14	96.21
R15	92.02



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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.

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Electrical measurements are measured using the listed equipment.

Disclaimers:

The results related only to the samples as received and tested. This report must not be used by the customer to claim product certification, approval or endorsement by NVLAP, NIST or any agency of the Federal Government.

Report Prepared by : Kunjan Modi

Test Report Reviewed by:

Steve Kang
Quality Assurance

**Attached are photometric data reports.*

LIGHT LABORATORY INC.
8165 E. Kaiser Blvd. Anaheim, CA 92808
www.lightlaboratory.com

Photometric Test Report

IES ROAD REPORT
PHOTOMETRIC FILENAME : L062310801.IES

DESCRIPTIVE INFORMATION (From Photometric File)

IESNA:LM-63-2002
[TEST] L062310801
[TESTLAB] LIGHT LABORATORY, INC. (www.lightlaboratory.com)
[ISSUEDATE] 6/21/2023
[MANUFAC] FX Luminaire / Lumascape
[LUMCAT] FC-LED20WFL-GW-360-FW
[LUMINAIRE] FC 20W Ground Wash Flat White
[BALLASTCAT] N/A
[OTHER] INDICATING THE CANDELA VALUES ARE ABSOLUTE AND
[MORE] SHOULD NOT BE FACTORED FOR DIFFERENT LAMP RATINGS.
[INPUT] 12 VAC
[TEST PROCEDURE] IESNA:LM-79-19

CHARACTERISTICS

IES Classification	N.A.
Longitudinal Classification	N.A.
Lumens Per Lamp	N.A. (absolute)
Total Lamp Lumens	N.A. (absolute)
Luminaire Lumens	10
Downward Total Efficiency	N.A. (absolute)
Total Luminaire Efficiency	N.A. (absolute)
Luminaire Efficacy Rating (LER)	3
Total Luminaire Watts	2.87
Ballast Factor	1.00
Upward Waste Light Ratio	0.58
Maximum Candela	3.4
Maximum Candela Angle	35H 90V
Maximum Candela (<90 Degrees Vertical)	3
Maximum Candela Angle (<90 Degrees Vertical)	45H 85V
Maximum Candela At 90 Degrees Vertical	3.4 (34.0% Luminaire Lumens)
Maximum Candela from 80 to <90 Degrees Vertical	3 (30.0% Luminaire Lumens)
Cutoff Classification (deprecated)	N.A. (absolute)

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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 ROAD REPORT
PHOTOMETRIC FILENAME : L062310801.IES

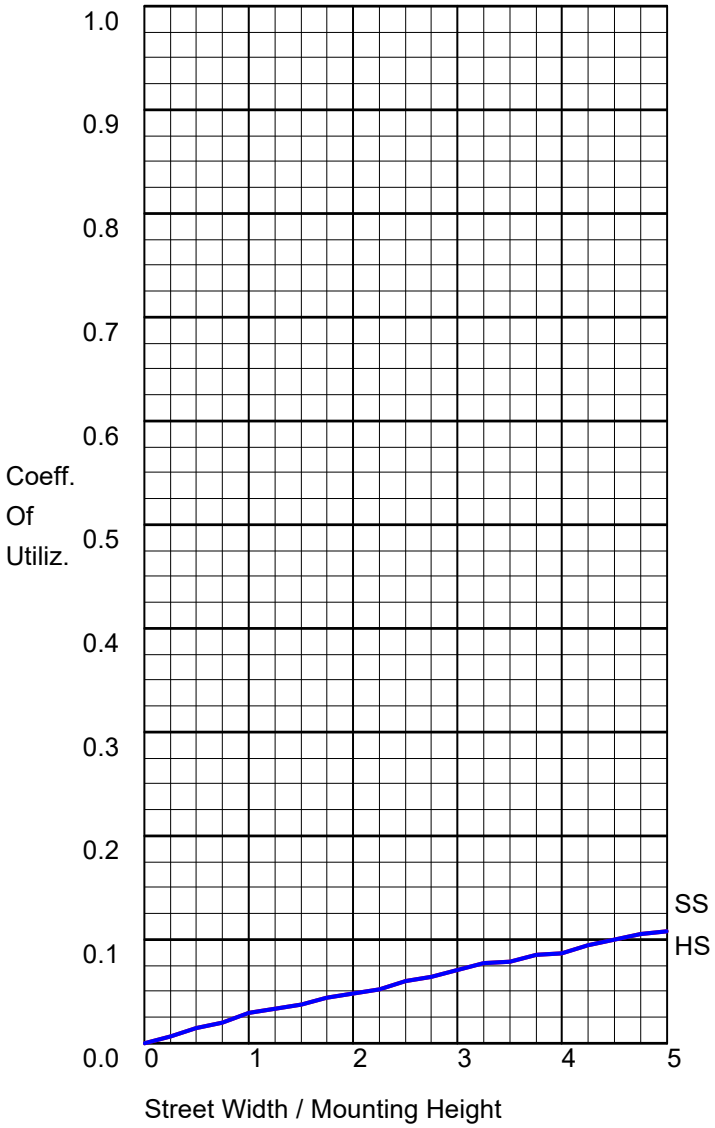
LUMINAIRE CLASSIFICATION SYSTEM (LCS)

	Lumens	% Lamp	% Luminaire
FL - Front-Low (0-30)	< 0.05	N.A.	0.4
FM - Front-Medium (30-60)	0.1	N.A.	1.2
FH - Front-High (60-80)	0.6	N.A.	6.3
FVH - Front-Very High (80-90)	1.3	N.A.	13.1
BL - Back-Low (0-30)	< 0.05	N.A.	0.4
BM - Back-Medium (30-60)	0.1	N.A.	1.2
BH - Back-High (60-80)	0.6	N.A.	6.3
BVH - Back-Very High (80-90)	1.3	N.A.	13.1
UL - Uplight-Low (90-100)	2.4	N.A.	24.9
UH - Uplight-High (100-180)	3.3	N.A.	33.9
Total	9.7	N.A.	100.0
BUG Rating	B0-U1-G0		

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IES ROAD REPORT
PHOTOMETRIC FILENAME : L062310801.IES

COEFFICIENTS OF UTILIZATION



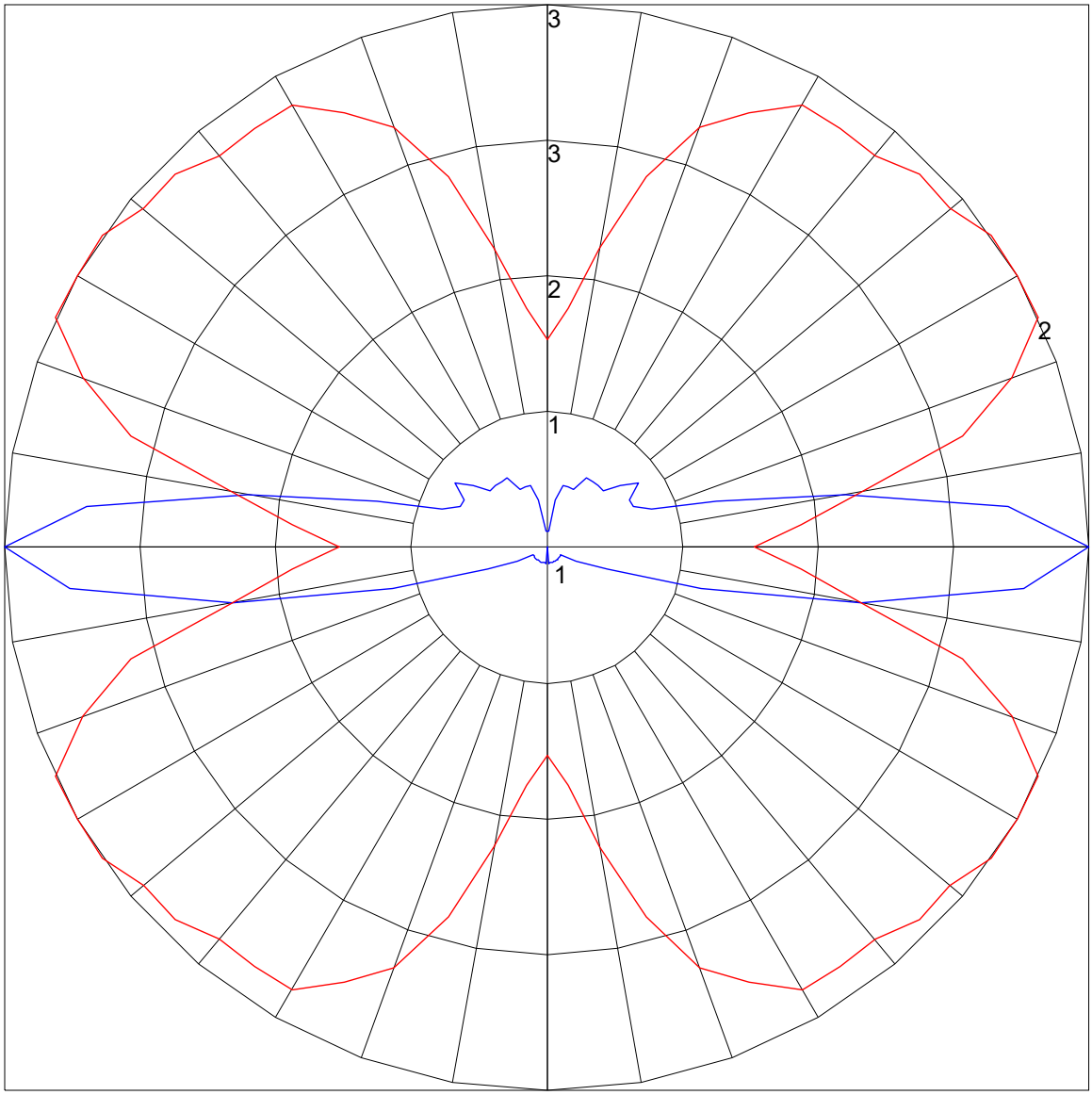
FLUX DISTRIBUTION

	Lumens	Percent Of Luminaire
Downward Street Side	2.0	20.8
Downward House Side	2.0	20.8
Downward Total	4.0	40.9
Upward Street Side	2.8	29.2
Upward House Side	2.8	29.2
Upward Total	5.6	57.3
Total Flux	9.6	98.3

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Results derived from content of manufacturers photometric file.

IES ROAD REPORT
PHOTOMETRIC FILENAME : L062310801.IES

POLAR GRAPH

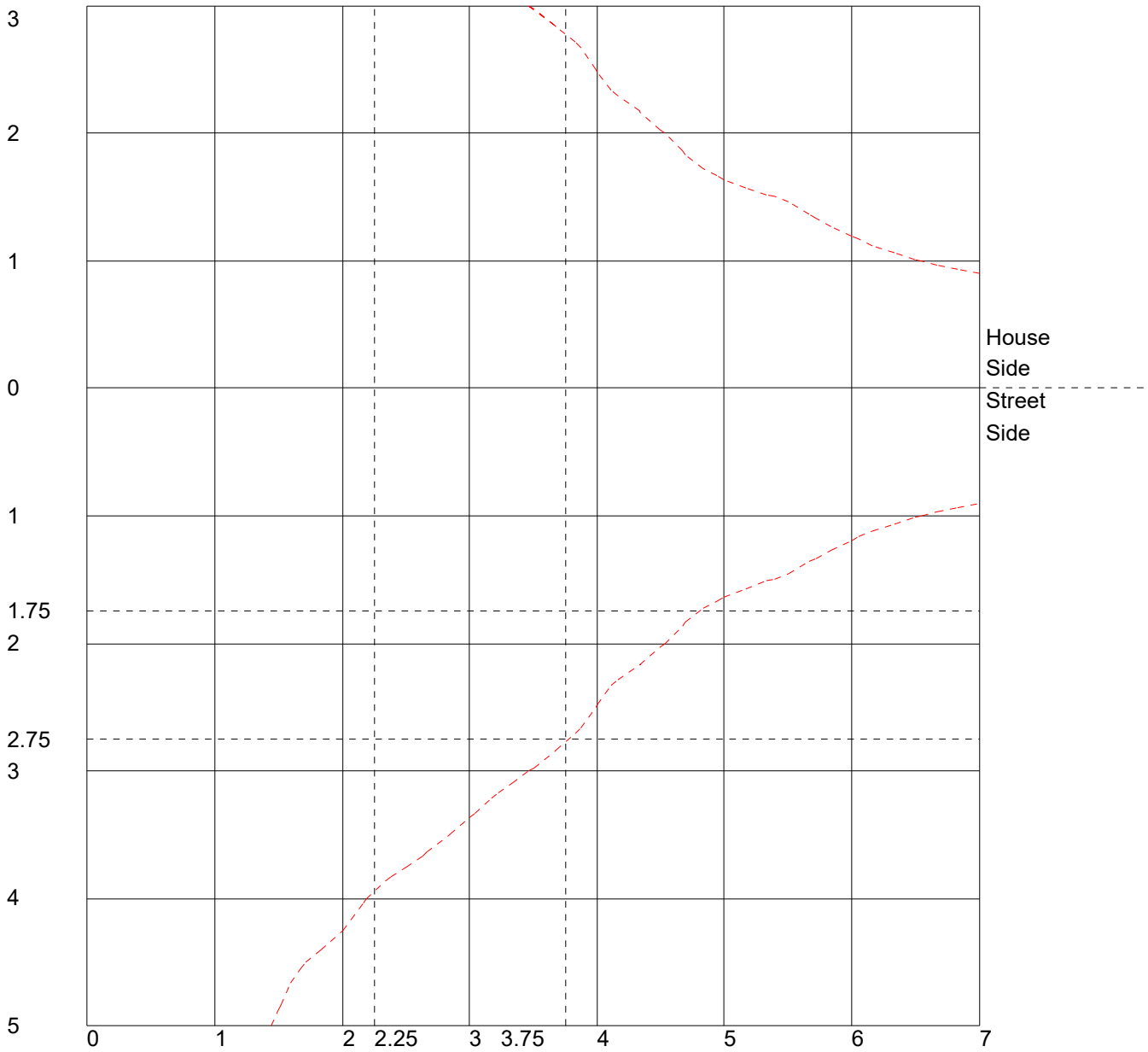


Maximum Candela = 3.4 Located At Horizontal Angle = 35, Vertical Angle = 90
1 - Vertical Plane Through Horizontal Angles (35 - 215) (Through Max. Cd.)
2 - Horizontal Cone Through Vertical Angle (90) (Through Max. Cd.)

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IES ROAD REPORT
PHOTOMETRIC FILENAME : L062310801.IES

ISOFOOTCANDLE LINES OF HORIZONTAL ILLUMINANCE



Distance In Units Of Mounting Height
Values Based On 10 Foot Mounting Height
1/2 Maximum Candela Trace Shown As Dashed Curve
(+) = Maximum Candela Point

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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.

LIGHT LABORATORY INC.
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p. 714.282.2270
f. 714.676.5558

Report No: L101410419
Date: 11/12/2014

NVLAP LAB CODE 200927-0

Report No: **L101410419**

Report Prepared For: Hunter Industries
1775 Diamond Street, San Marcos, CA. 92078

Model Number: **FCZDC3LEDLVBZ**

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 FCZDC3LEDLVBZ . Received in working and undamaged condition. No modifications were necessary.

Testing Condition: Fixture is tested with no special conditions.

Sample Arrival Date: 11/7/14

Date of Tests: 11/11/14 - 11/12/14

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	01/04/15
Xitron Power Analysis System	2503AH	MT-EL01	01/09/15
BK Precision DC Power Supply	1747	PSDC-04	01/08/15
Fluke Digital Thermometer	52k/J	MT-TP02-GC	01/04/15
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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f. 714.676.5558

Report No: L101410419
Date: 11/12/2014

NVLAP LAB CODE 200927-0

Test Summary	
Manufacturer:	Hunter Industries
Model Number:	FCZDC3LEDLVBZ
Driver Model Number:	N/A
Total Lumens:	70.22
Input Voltage (VAC/60Hz):	12.00
Input Current (Amp):	0.22
Input Power (W):	2.42
Input Power Factor:	0.92
Current ATHD @ 12V(%):	40%
Current ATHD @ 277V(%):	N/A
Efficacy:	29
Color Rendering Index (CRI):	81
Correlated Color Temperature (K):	3817
Chromaticity Coordinate x:	0.3912
Chromaticity Coordinate y:	0.3895
Ambient Temperature (°F):	77.0
Stabilization Time (Hours):	0:35
Total Operating Time (Hours):	1:35
Off State Power(W):	0.00



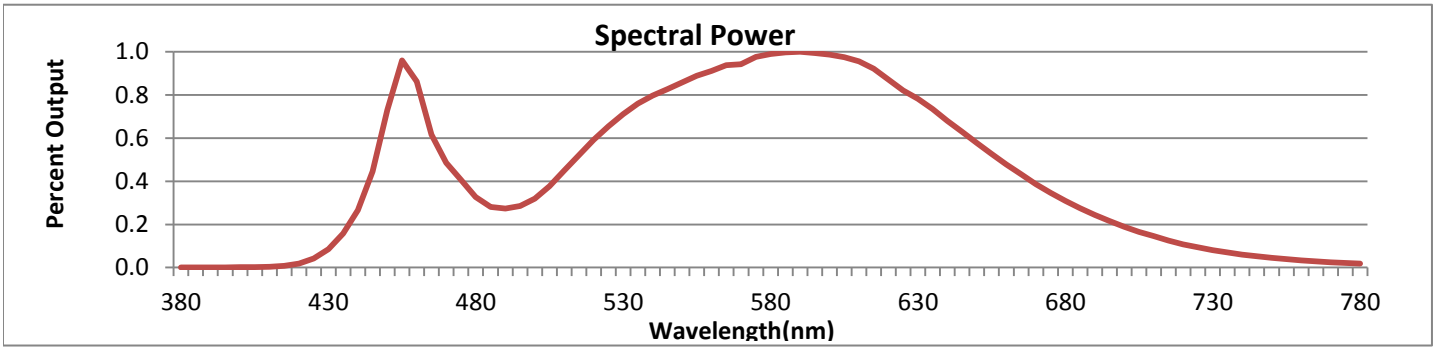
FIG. 1 LUMINAIRE

*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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Report No: L101410419
Date: 11/12/2014

NVLAP LAB CODE 200927-0



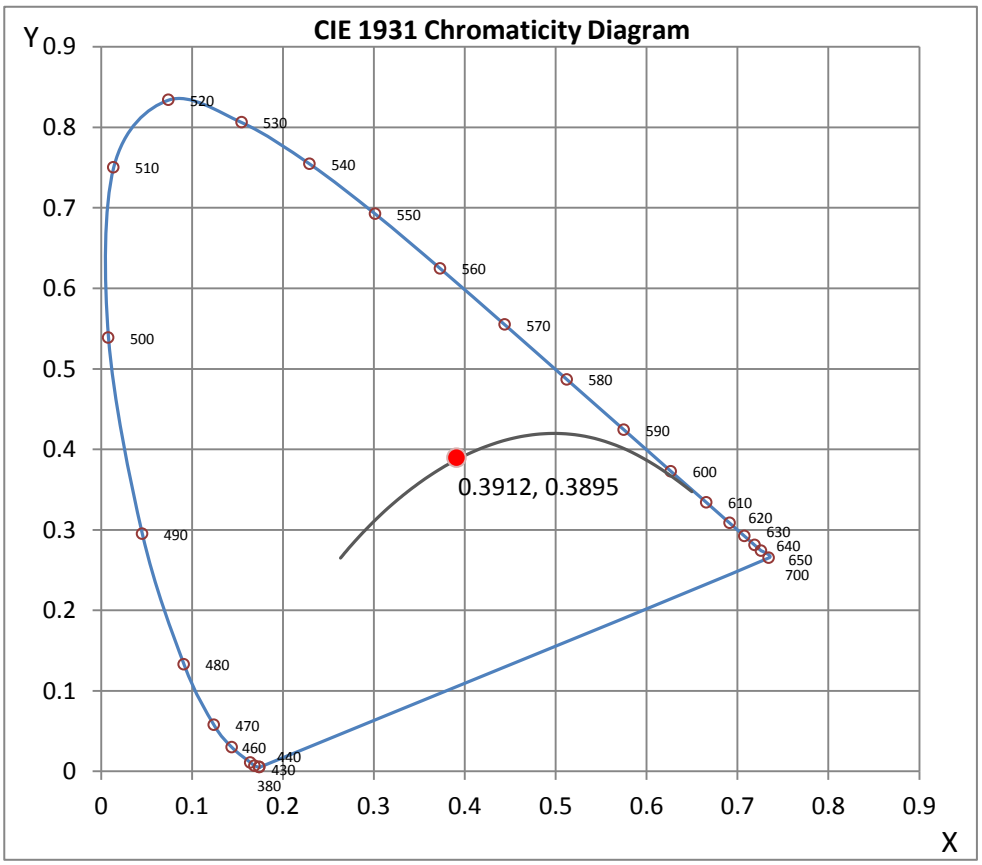
Wavelength	W/m²nm	440	0.2657	510	0.4500	580	0.9899	650	0.5778	720	0.1075
380	0.0008	450	0.7312	520	0.5919	590	1.0000	660	0.4778	730	0.0809
390	0.0009	460	0.8621	530	0.7111	600	0.9869	670	0.3859	740	0.0603
400	0.0014	470	0.4858	540	0.7974	610	0.9564	680	0.3091	750	0.0450
410	0.0038	480	0.3274	550	0.8581	620	0.8710	690	0.2441	760	0.0331
420	0.0185	490	0.2732	560	0.9116	630	0.7831	700	0.1896	770	0.0249
430	0.0854	500	0.3193	570	0.9423	640	0.6808	710	0.1452	780	0.0188

CRI & CCT

x	0.3912
y	0.3895
u'	0.2271
v'	0.5087
CRI	80.70
CCT	3817
Duv	0.00286

R Values

R1	78.85
R2	87.62
R3	92.71
R4	77.06
R5	76.67
R6	80.75
R7	87.17
R8	65.15
R9	11.03
R10	68.10
R11	72.23
R12	50.89
R13	80.89
R14	95.37



*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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p. 714.282.2270
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Report No: L101410419
Date: 11/12/2014

NVLAP LAB CODE 200927-0

Test Methods

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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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p. 714.282.2270
f. 714.676.5558

Photometric Test Report

IES FLOOD REPORT
PHOTOMETRIC FILENAME : L101410419.IES

DESCRIPTIVE INFORMATION (From Photometric File)

IESNA:LM-63-2002
[TEST] L101410419
[TESTLAB] LIGHT LABORATORY, INC.
[ISSUEDATE] 11/12/2014
[MANUFAC] HUNTER INDUSTRIES
[LUMCAT] FCZDC3LEDLVBZ
[LUMINAIRE] 4"DIA. X 5-1/2"H. LED FIXTURE
[MORE] DIFFUSED LENS
[BALLASTCAT] N.A.
[BALLAST] 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, 2.42W
[_TEST PROCEDURE] IESNA:LM-79-08

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

CHARACTERISTICS

NEMA Type	5 H x 5 V
Maximum Candela	87.51
Maximum Candela Angle	0H 5V
Horizontal Beam Angle (50%)	45.9
Vertical Beam Angle (50%)	44.9
Horizontal Field Angle (10%)	87.9
Vertical Field Angle (10%)	94.1
Lumens Per Lamp	N.A. (absolute)
Total Lamp Lumens	N.A. (absolute)
Beam Lumens	30
Beam Efficiency	N.A.
Field Lumens	59
Field Efficiency	N.A.
Spill Lumens	11
Luminaire Lumens	70.22
Total Efficiency	N.A.
Total Luminaire Watts	2.42
Ballast Factor	1.00

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Results derived from content of manufacturers photometric file.

IES FLOOD REPORT
PHOTOMETRIC FILENAME : L101410419.IES

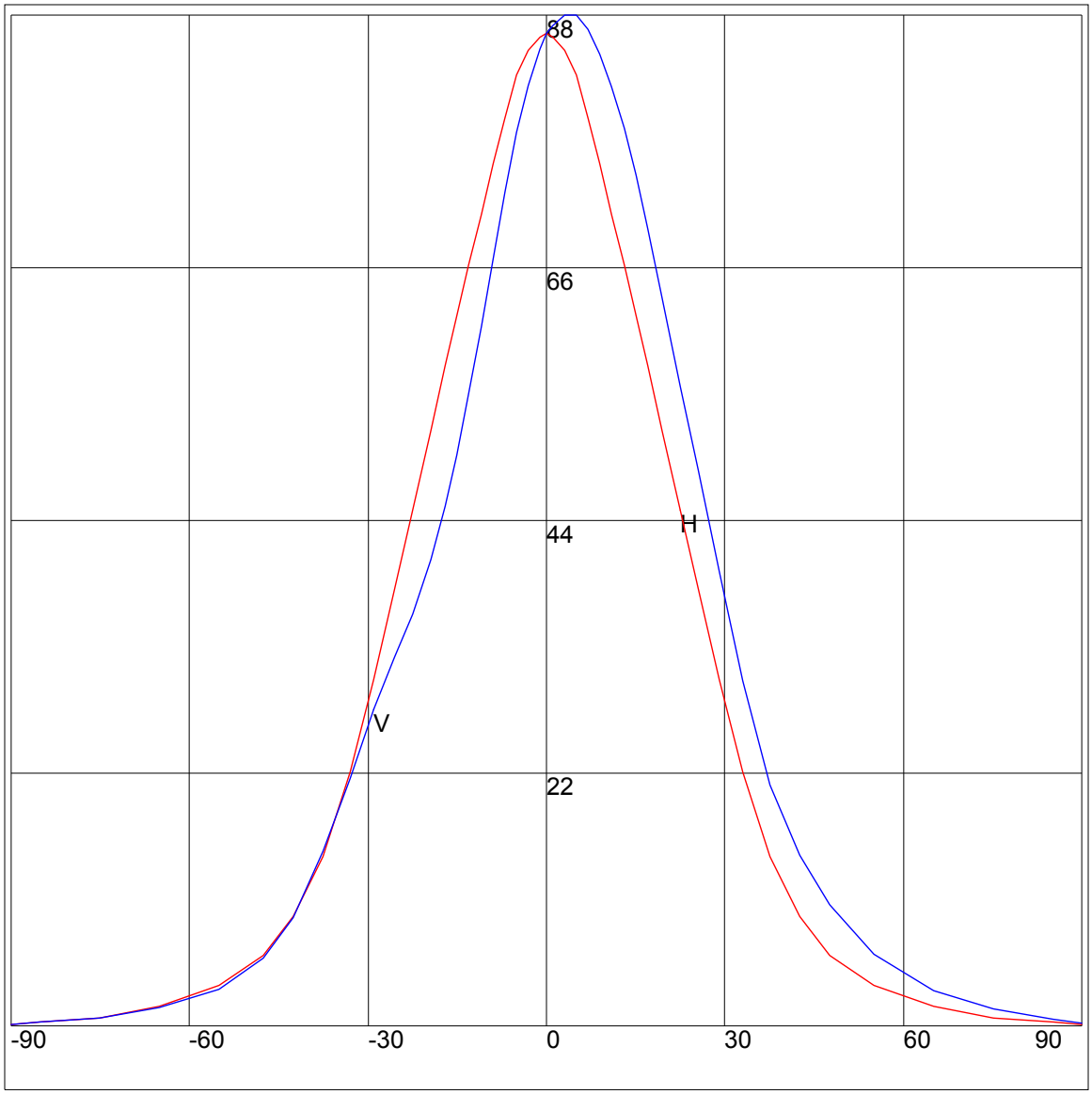
AXIAL CANDELA

DEG.	HOR.	DEG.	VERT.
90	.21	90	.31
85	.34	85	.62
75	.76	75	1.54
65	1.73	65	3.12
55	3.54	55	6.28
47.5	6.16	47.5	10.54
42.5	9.47	42.5	14.83
37.5	14.69	37.5	20.9
33	21.98	33	29.93
29	30.07	29	39.4
25.5	37.79	25.5	48.01
22.5	44.68	22.5	55.43
19.5	51.58	19.5	63.07
17	57.15	17	69.05
15	61.5	15	73.65
13	65.84	13	77.68
11	70.29	11	81.28
9	74.61	9	84.17
7	78.63	7	86.25
5	82.28	5	87.51
3	84.44	3	87.48
1	85.58	1	86.58
0	85.98	0	85.98
-1	85.58	-1	84.54
-3	84.44	-3	81.37
-5	82.28	-5	77.36
-7	78.63	-7	72.21
-9	74.61	-9	66.49
-11	70.29	-11	60.53
-13	65.84	-13	54.73
-15	61.5	-15	49.47
-17	57.15	-17	45.05
-19.5	51.58	-19.5	40.36
-22.5	44.68	-22.5	35.71
-25.5	37.79	-25.5	32
-29	30.07	-29	27.46
-33	21.98	-33	21.49
-37.5	14.69	-37.5	15.12
-42.5	9.47	-42.5	9.46
-47.5	6.16	-47.5	5.87
-55	3.54	-55	3.23
-65	1.73	-65	1.6
-75	.76	-75	.69
-85	.34	-85	.34
-90	.21	-90	.21

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AXIAL CANDELA DISPLAY

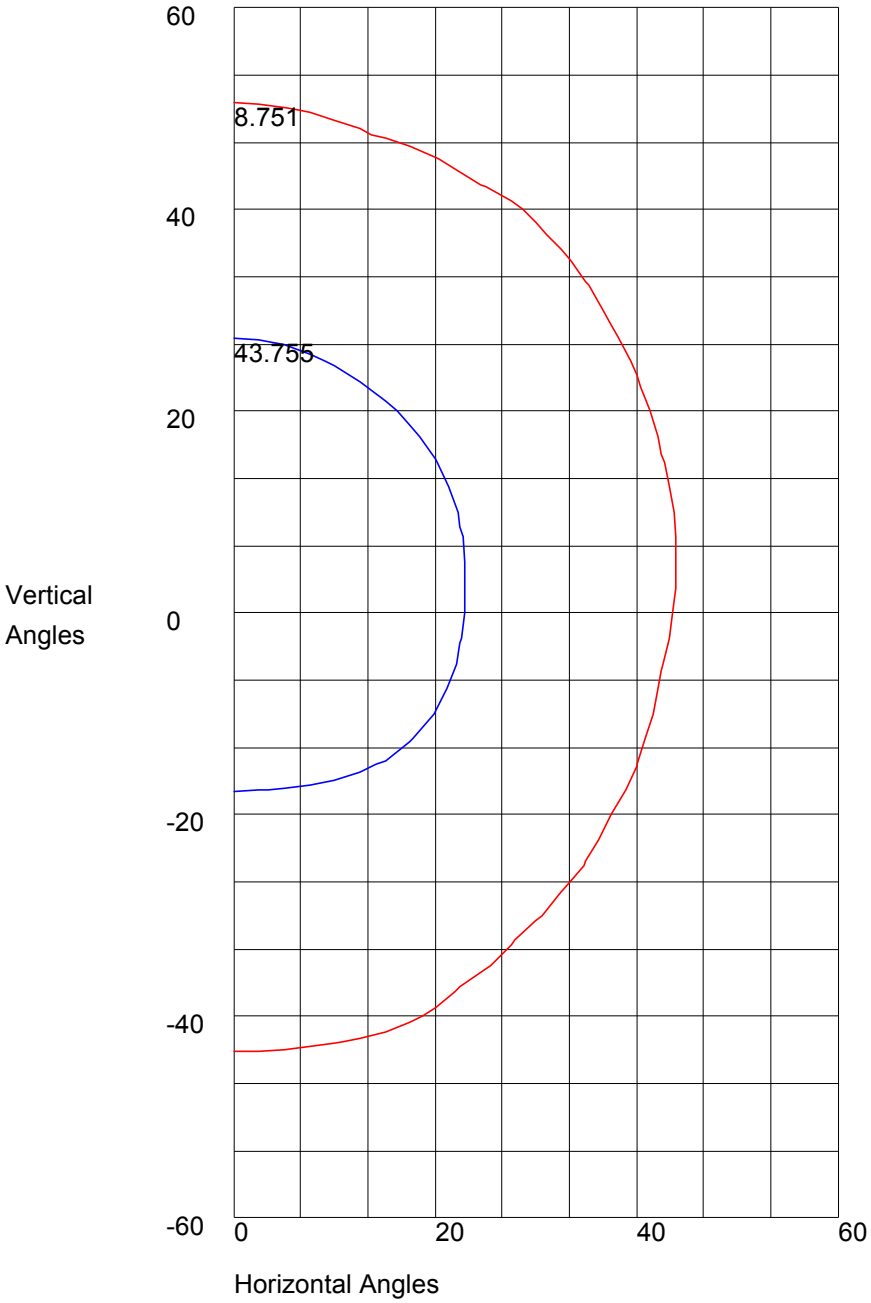


Maximum Candela = 87.51 Located At Horizontal Angle = 0, Vertical Angle = 5
H - Horizontal Axial Candela
V - Vertical Axial Candela

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IES FLOOD REPORT
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ISOCANDELA CURVES



Maximum Candela = 87.51 Located At Horizontal Angle = 0, Vertical Angle = 5
50% Maximum Candela = 43.755
10% Maximum Candela = 8.751

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

Report No: L021602104
Date: 2/16/2016

NVLAP LAB CODE 200927-0

Report No: **L021602104**

Report Prepared For: Hunter Industries
1785 La Costa Meadows Dr. San Marcos, CA 92078

Model Number: **FC-ZDC-3LED-GW-BS**

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 FC-ZDC-3LED-GW-BS . Received in working and undamaged condition. No modifications were necessary.

Testing Condition: Fixture is tested with no special conditions.

Sample Arrival Date: 2/11/16

Date of Tests: 2/15/16 - 2/16/16

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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Report No: L021602104
Date: 2/16/2016

NVLAP LAB CODE 200927-0

Test Summary	
Manufacturer:	Hunter Industries
Model Number:	FC-ZDC-3LED-GW-BS
Driver Model Number:	N/A
Total Lumens:	35.40
Input Voltage (VAC/60Hz):	12.00
Input Current (Amp):	0.47
Input Power (W):	5.22
Input Power Factor:	0.93
Current ATHD @ 12V(%):	38%
Current ATHD @ 277V(%):	N/A
Efficacy:	7
Color Rendering Index (CRI):	83
Correlated Color Temperature (K):	3619
Chromaticity Coordinate x:	0.4016
Chromaticity Coordinate y:	0.3954
Ambient Temperature (°C):	25.0
Stabilization Time (Hours):	0:30
Total Operating Time (Hours):	1:50
Off State Power(W):	0.00

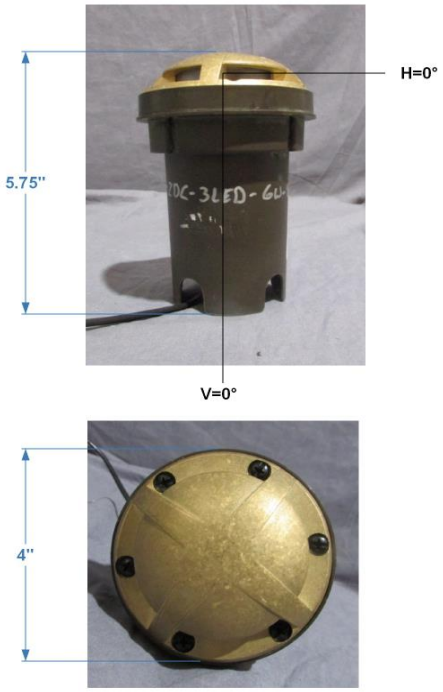


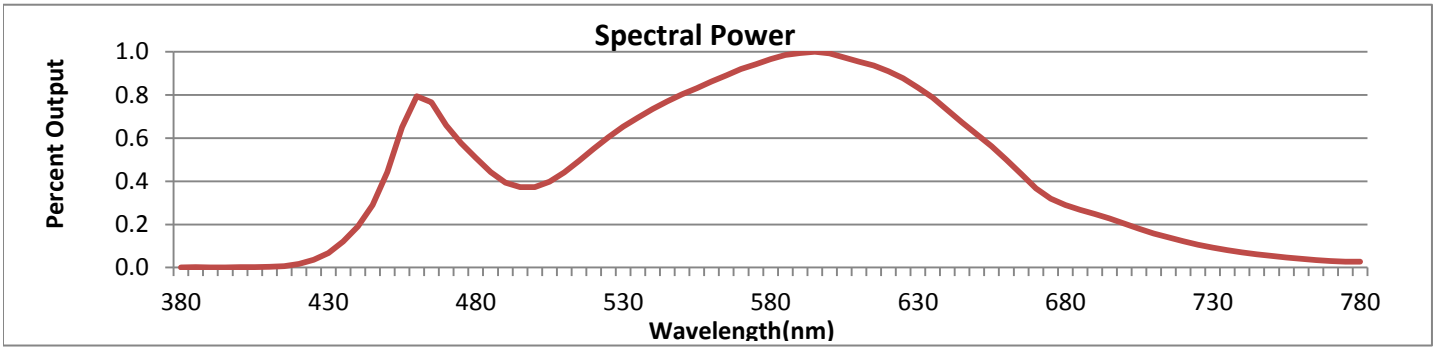
FIG. 1 LUMINAIRE

*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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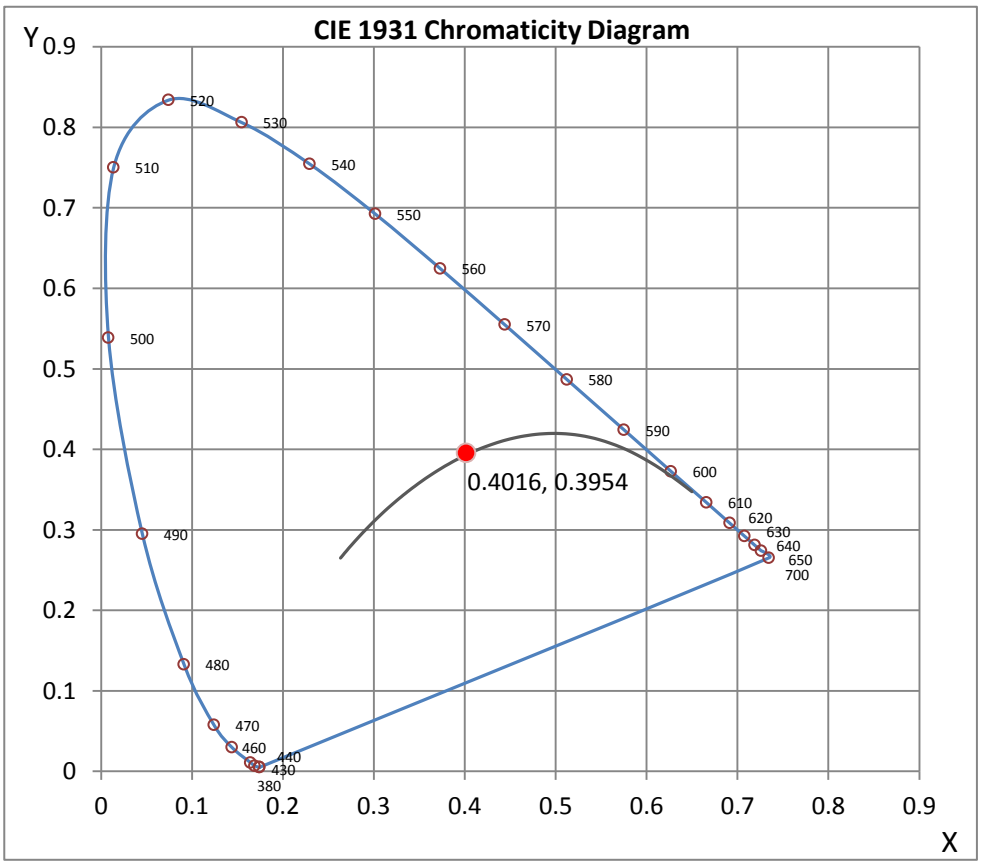
Wavelength	W/m²nm	440	0.0001	510	0.0002	580	0.0003	650	0.0002	720	0.0000
380	0.0000	450	0.0002	520	0.0002	590	0.0003	660	0.0002	730	0.0000
390	0.0000	460	0.0003	530	0.0002	600	0.0003	670	0.0001	740	0.0000
400	0.0000	470	0.0002	540	0.0003	610	0.0003	680	0.0001	750	0.0000
410	0.0000	480	0.0002	550	0.0003	620	0.0003	690	0.0001	760	0.0000
420	0.0000	490	0.0001	560	0.0003	630	0.0003	700	0.0001	770	0.0000
430	0.0000	500	0.0001	570	0.0003	640	0.0003	710	0.0001	780	0.0000

CRI & CCT

x	0.4016
y	0.3954
u'	0.2314
v'	0.5126
CRI	83.00
CCT	3619
Duv	0.00289

R Values

R1	81.69
R2	92.67
R3	96.25
R4	76.14
R5	79.73
R6	88.46
R7	84.42
R8	64.86
R9	17.87
R10	80.08
R11	72.10
R12	62.46
R13	84.69
R14	98.34



*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: L021602104
Date: 2/16/2016

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: 12*

*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 ROAD REPORT
PHOTOMETRIC FILENAME : L021602104.IES

DESCRIPTIVE INFORMATION (From Photometric File)

IESNA:LM-63-2002
[TEST] L021602104
[TESTLAB] LIGHT LABORATORY, INC.
[ISSUEDATE] 2/16/2016
[MANUFAC] HUNTER INDUSTRIES
[LUMCAT] FC-ZDC-3LED-GW-BS
[LUMINAIRE] 4"DIA. X 5.75"H. FC 3 LED, ZDC, GROUND WASH, NATURAL BRASS 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, 5.22W
[TEST PROCEDURE] IESNA:LM-79-08

CHARACTERISTICS

IES Classification	Type VS
Longitudinal Classification	Medium
Lumens Per Lamp	N.A. (absolute)
Total Lamp Lumens	N.A. (absolute)
Luminaire Lumens	35
Downward Total Efficiency	N.A. (absolute)
Total Luminaire Efficiency	N.A. (absolute)
Luminaire Efficacy Rating (LER)	7
Total Luminaire Watts	5.22
Ballast Factor	1.00
Upward Waste Light Ratio	0.12
Maximum Candela	8.924
Maximum Candela Angle	75H 75V
Maximum Candela (<90 Degrees Vertical)	8.924
Maximum Candela Angle (<90 Degrees Vertical)	75H 75V
Maximum Candela At 90 Degrees Vertical	3.294 (9.4% Luminaire Lumens)
Maximum Candela from 80 to <90 Degrees Vertical	8.873 (25.4% Luminaire Lumens)
Cutoff Classification (deprecated)	N.A. (absolute)

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LUMINAIRE CLASSIFICATION SYSTEM (LCS)

	Lumens	% Lamp	% Luminaire
FL - Front-Low (0-30)	0.4	N.A.	1.1
FM - Front-Medium (30-60)	5.7	N.A.	16.2
FH - Front-High (60-80)	6.9	N.A.	19.4
FVH - Front-Very High (80-90)	2.6	N.A.	7.4
BL - Back-Low (0-30)	0.4	N.A.	1.1
BM - Back-Medium (30-60)	5.7	N.A.	16.2
BH - Back-High (60-80)	6.9	N.A.	19.4
BVH - Back-Very High (80-90)	2.6	N.A.	7.4
UL - Uplight-Low (90-100)	2.0	N.A.	5.6
UH - Uplight-High (100-180)	2.2	N.A.	6.3
Total	35.4	N.A.	100.0
BUG Rating	B0-U1-G0		

ZONAL LUMEN SUMMARY

Zone	%
0-20	0.5
0-30	2.2
0-40	8.8
0-60	34.7
0-80	73.4
0-90	88.1
10-90	88.1
20-40	8.3
20-50	19.3
40-70	44.2
60-80	38.8
70-80	20.4
80-90	14.7
90-110	8
90-120	9.8
90-130	11.1
90-150	11.9
90-180	11.9
110-180	3.8
0-180	100

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CANDELA TABULATION

Vert. Angles	Horizontal Angles									
	0	5	10	15	20	25	30	35	40	45
0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
5	0.051	0.059	0.059	0.068	0.076	0.076	0.076	0.076	0.076	0.076
10	0.238	0.246	0.238	0.229	0.229	0.221	0.204	0.204	0.204	0.195
15	0.577	0.569	0.552	0.543	0.509	0.501	0.475	0.450	0.442	0.450
20	0.849	0.832	0.824	0.790	0.764	0.747	0.705	0.696	0.679	0.696
25	1.206	1.197	1.189	1.172	1.163	1.146	1.104	1.044	0.993	0.942
30	2.547	2.539	2.496	2.479	2.420	2.233	2.012	1.792	1.520	1.367
35	4.942	4.933	4.891	4.848	4.780	4.432	3.795	3.065	2.309	1.876
40	5.570	5.604	5.536	5.494	5.383	5.027	4.288	3.396	2.513	1.987
45	6.215	6.224	6.181	6.122	5.994	5.553	4.763	3.719	2.743	2.080
50	6.810	6.835	6.793	6.716	6.597	6.088	5.222	4.067	2.878	2.191
55	7.336	7.378	7.344	7.251	7.098	6.563	5.578	4.373	3.006	2.267
60	7.811	7.862	7.828	7.718	7.557	6.988	5.876	4.568	3.082	2.309
65	8.185	8.228	8.194	8.066	7.905	7.328	6.122	4.678	3.108	2.343
70	8.423	8.457	8.440	8.321	8.126	7.557	6.266	4.695	3.082	2.369
75	8.508	8.516	8.508	8.397	8.202	7.608	6.292	4.678	3.167	2.352
80	8.406	8.397	8.397	8.278	8.075	7.429	6.207	4.568	3.074	2.318
81	8.151	8.134	8.143	8.049	7.837	7.200	5.961	4.526	2.980	2.259
82	7.710	7.710	7.727	7.633	7.438	6.844	5.638	4.271	2.836	2.140
83	7.200	7.183	7.209	7.132	6.928	6.360	5.239	3.940	2.658	2.038
84	6.606	6.606	6.606	6.546	6.343	5.825	4.806	3.583	2.462	1.936
85	5.977	5.977	6.003	5.961	5.748	5.281	4.364	3.252	2.318	1.809
86	5.349	5.366	5.375	5.349	5.162	4.704	3.931	2.912	2.157	1.673
87	4.755	4.780	4.780	4.755	4.593	4.169	3.507	2.641	1.961	1.562
88	4.211	4.228	4.228	4.177	4.042	3.660	3.057	2.394	1.792	1.452
89	3.719	3.744	3.736	3.676	3.532	3.210	2.709	2.148	1.639	1.367
90	3.277	3.294	3.260	3.184	3.074	2.793	2.377	1.910	1.494	1.299
91	2.904	2.921	2.878	2.785	2.658	2.437	2.089	1.698	1.367	1.197
92	1.647	1.656	1.639	1.588	1.537	1.435	1.325	1.206	1.095	1.053
93	1.562	1.562	1.537	1.503	1.460	1.384	1.325	1.274	1.240	1.240
94	1.953	1.936	1.902	1.851	1.775	1.707	1.639	1.605	1.605	1.613
95	2.276	2.259	2.216	2.140	2.046	1.961	1.910	1.910	1.927	1.953
96	2.496	2.462	2.377	2.276	2.165	2.072	2.038	2.080	2.140	2.182
97	2.547	2.530	2.479	2.386	2.284	2.191	2.140	2.123	2.157	2.199
98	1.987	1.987	1.978	1.944	1.868	1.783	1.690	1.613	1.596	1.622
99	0.968	0.968	0.976	0.976	1.002	1.002	1.010	1.036	1.036	1.044
100	0.900	0.892	0.900	0.900	0.892	0.900	0.909	0.925	0.917	0.925
105	0.781	0.798	0.790	0.798	0.807	0.807	0.815	0.815	0.824	0.832
110	0.696	0.696	0.696	0.696	0.713	0.722	0.730	0.730	0.739	0.722
115	0.611	0.620	0.628	0.620	0.637	0.637	0.645	0.645	0.645	0.645
120	0.560	0.543	0.543	0.552	0.552	0.560	0.560	0.560	0.560	0.560
125	0.492	0.492	0.492	0.492	0.492	0.492	0.492	0.501	0.509	0.509
130	0.459	0.467	0.467	0.467	0.467	0.467	0.475	0.475	0.475	0.475
135	0.464	0.464	0.464	0.464	0.464	0.464	0.464	0.464	0.464	0.464
140	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
145	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
150	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
155	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
160	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
165	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
170	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
175	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
180	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

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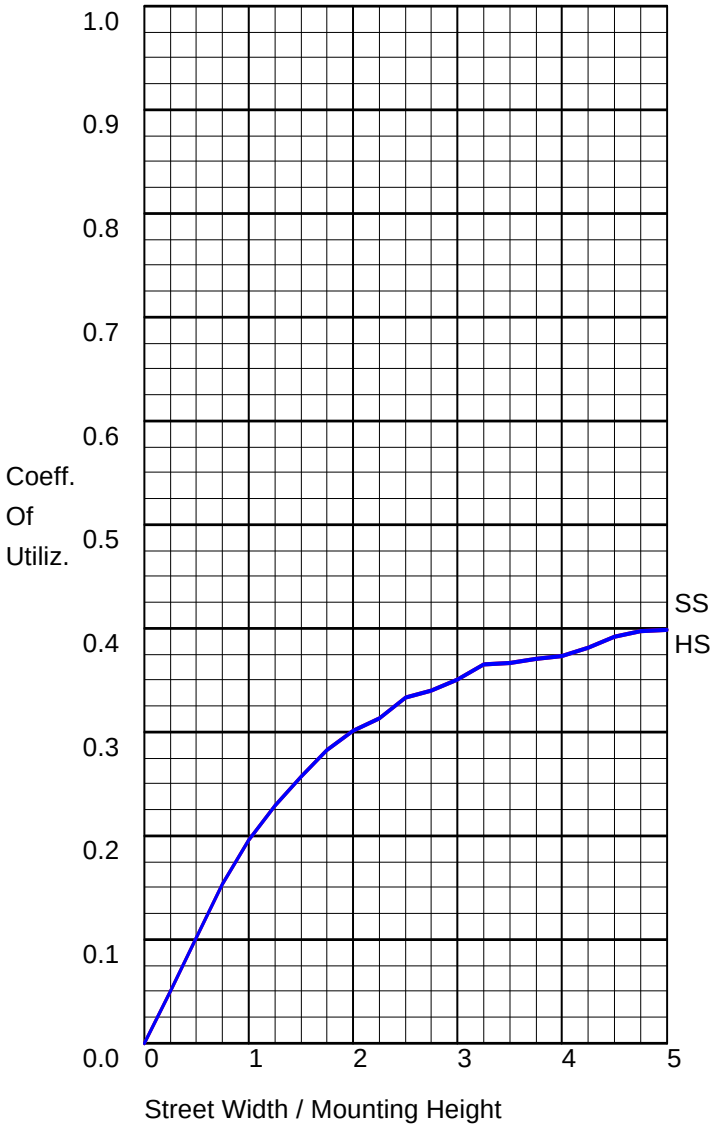
CANDELA TABULATION - (Cont.)

Vert. Angles	Horizontal Angles								
	50	55	60	65	70	75	80	85	90
0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
5	0.068	0.068	0.068	0.059	0.059	0.068	0.068	0.059	0.068
10	0.187	0.187	0.204	0.212	0.221	0.246	0.263	0.272	0.272
15	0.450	0.459	0.475	0.509	0.543	0.577	0.611	0.628	0.628
20	0.696	0.722	0.739	0.773	0.807	0.832	0.866	0.875	0.883
25	0.951	1.002	1.053	1.121	1.180	1.206	1.257	1.316	1.308
30	1.426	1.707	2.012	2.267	2.437	2.522	2.581	2.641	2.666
35	2.080	2.768	3.617	4.271	4.687	4.848	4.942	5.120	5.145
40	2.242	3.099	4.025	4.814	5.307	5.477	5.553	5.748	5.740
45	2.394	3.371	4.483	5.383	5.944	6.130	6.173	6.360	6.368
50	2.530	3.643	4.950	5.935	6.563	6.767	6.784	6.954	6.979
55	2.649	3.897	5.383	6.487	7.158	7.387	7.378	7.514	7.506
60	2.802	4.135	5.782	6.979	7.710	7.930	7.905	7.981	7.981
65	2.938	4.322	6.113	7.387	8.202	8.397	8.355	8.363	8.304
70	3.006	4.585	6.317	7.701	8.559	8.754	8.678	8.618	8.559
75	3.040	4.644	6.385	7.888	8.745	8.924	8.813	8.695	8.627
80	2.997	4.551	6.411	7.854	8.703	8.873	8.745	8.635	8.542
81	2.895	4.407	6.198	7.625	8.414	8.627	8.474	8.397	8.321
82	2.793	4.160	5.850	7.166	7.964	8.160	8.007	7.939	7.879
83	2.658	3.855	5.409	6.580	7.395	7.557	7.455	7.387	7.336
84	2.454	3.532	4.857	5.977	6.699	6.869	6.818	6.725	6.742
85	2.225	3.201	4.305	5.358	5.986	6.156	6.147	6.054	6.096
86	2.021	2.853	3.812	4.738	5.307	5.468	5.468	5.392	5.417
87	1.851	2.530	3.388	4.186	4.636	4.814	4.831	4.772	4.789
88	1.664	2.242	2.989	3.676	4.059	4.203	4.220	4.169	4.194
89	1.554	2.021	2.649	3.218	3.558	3.660	3.668	3.617	3.617
90	1.426	1.851	2.369	2.836	3.116	3.184	3.176	3.125	3.108
91	1.333	1.707	2.106	2.505	2.726	2.776	2.743	2.700	2.683
92	1.112	1.248	1.392	1.528	1.613	1.613	1.588	1.562	1.545
93	1.282	1.308	1.367	1.443	1.486	1.503	1.503	1.511	1.511
94	1.639	1.673	1.707	1.749	1.809	1.842	1.885	1.910	1.919
95	1.970	1.970	1.978	2.004	2.063	2.140	2.199	2.242	2.259
96	2.165	2.131	2.089	2.106	2.174	2.276	2.386	2.454	2.479
97	2.216	2.191	2.174	2.233	2.343	2.471	2.598	2.683	2.717
98	1.647	1.698	1.741	1.817	1.936	2.046	2.123	2.174	2.191
99	1.044	1.027	1.036	1.044	1.044	1.027	1.010	0.993	1.002
100	0.934	0.934	0.925	0.917	0.917	0.909	0.909	0.900	0.900
105	0.832	0.824	0.824	0.815	0.815	0.807	0.807	0.815	0.815
110	0.730	0.730	0.722	0.722	0.722	0.713	0.713	0.713	0.713
115	0.628	0.645	0.637	0.637	0.637	0.637	0.637	0.628	0.628
120	0.560	0.560	0.560	0.560	0.560	0.552	0.543	0.552	0.543
125	0.501	0.501	0.501	0.501	0.501	0.501	0.501	0.492	0.509
130	0.475	0.475	0.475	0.475	0.467	0.467	0.475	0.475	0.475
135	0.464	0.464	0.464	0.464	0.464	0.464	0.464	0.464	0.464
140	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
145	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
150	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
155	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
160	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
165	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
170	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
175	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
180	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

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Results derived from content of manufacturers photometric file.

IES ROAD REPORT
PHOTOMETRIC FILENAME : L021602104.IES

COEFFICIENTS OF UTILIZATION



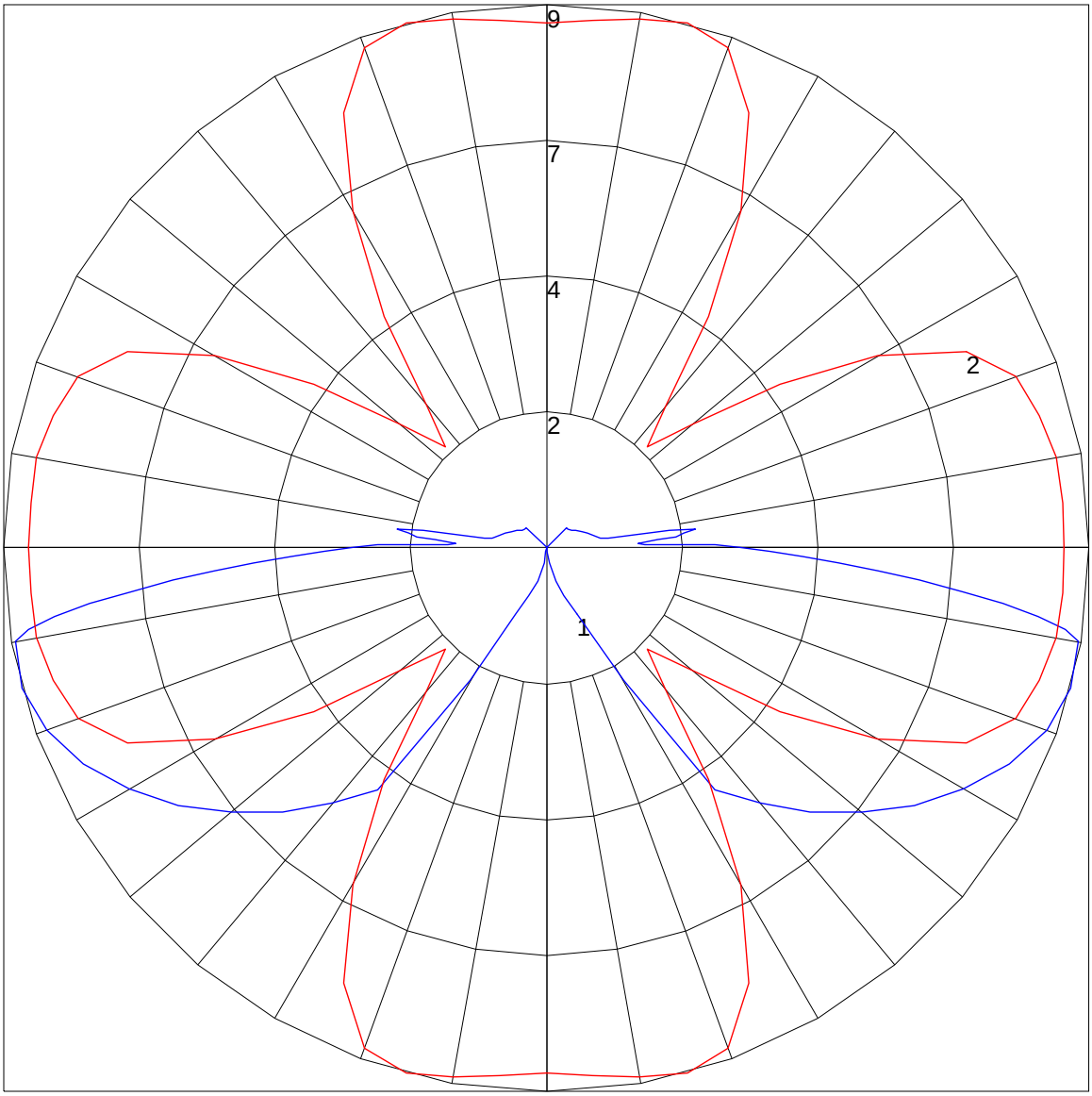
FLUX DISTRIBUTION

	Lumens	Percent Of Luminaire
Downward Street Side	15.6	44.1
Downward House Side	15.6	44.1
Downward Total	31.2	88.1
Upward Street Side	2.1	5.9
Upward House Side	2.1	5.9
Upward Total	4.2	11.9
Total Flux	35.4	100.0

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Results derived from content of manufacturers photometric file.

IES ROAD REPORT
PHOTOMETRIC FILENAME : L021602104.IES

POLAR GRAPH

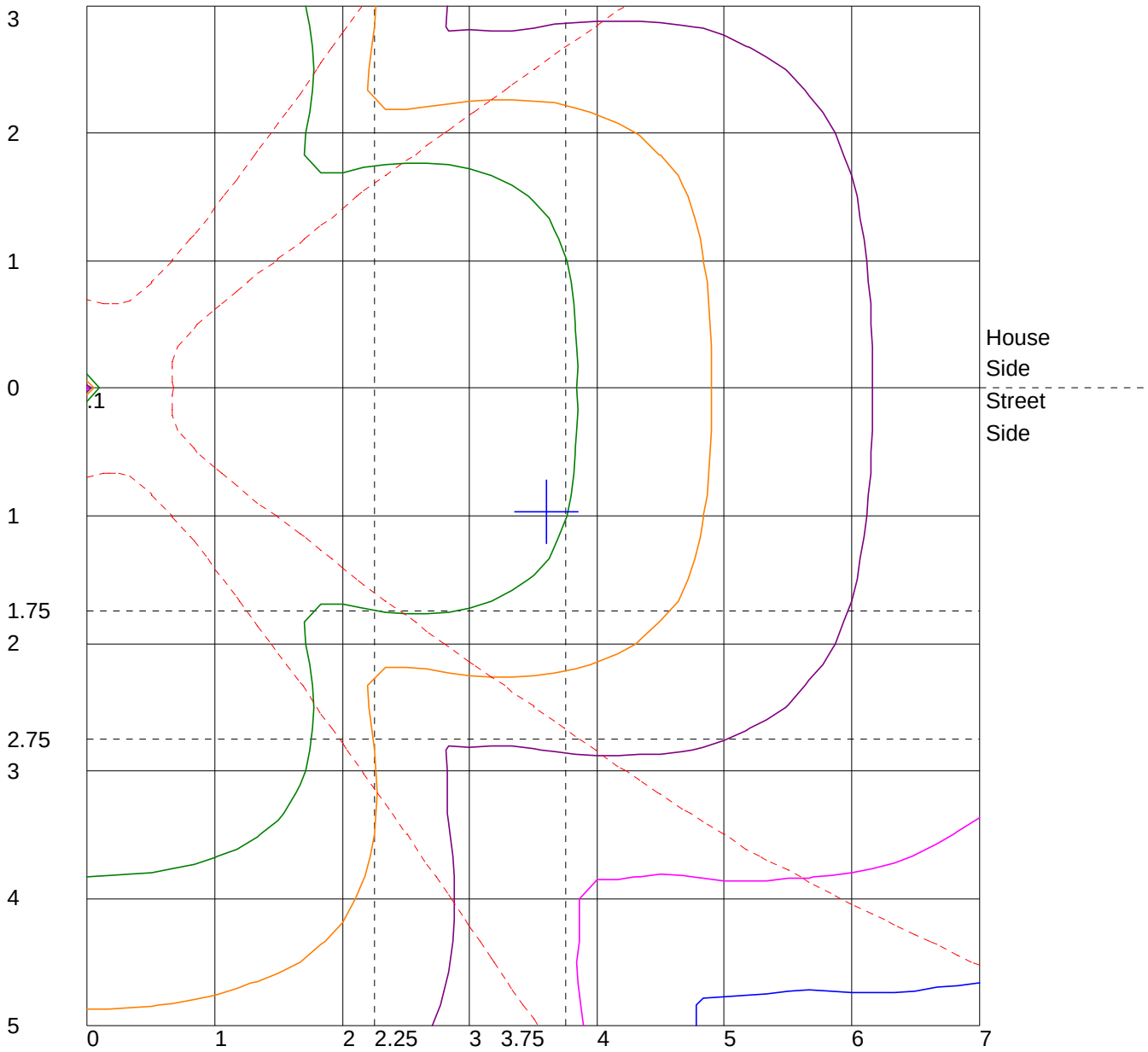


Maximum Candela = 8.924 Located At Horizontal Angle = 75, Vertical Angle = 75
1 - Vertical Plane Through Horizontal Angles (75 - 255) (Through Max. Cd.)
2 - Horizontal Cone Through Vertical Angle (75) (Through Max. Cd.)

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PHOTOMETRIC FILENAME : L021602104.IES

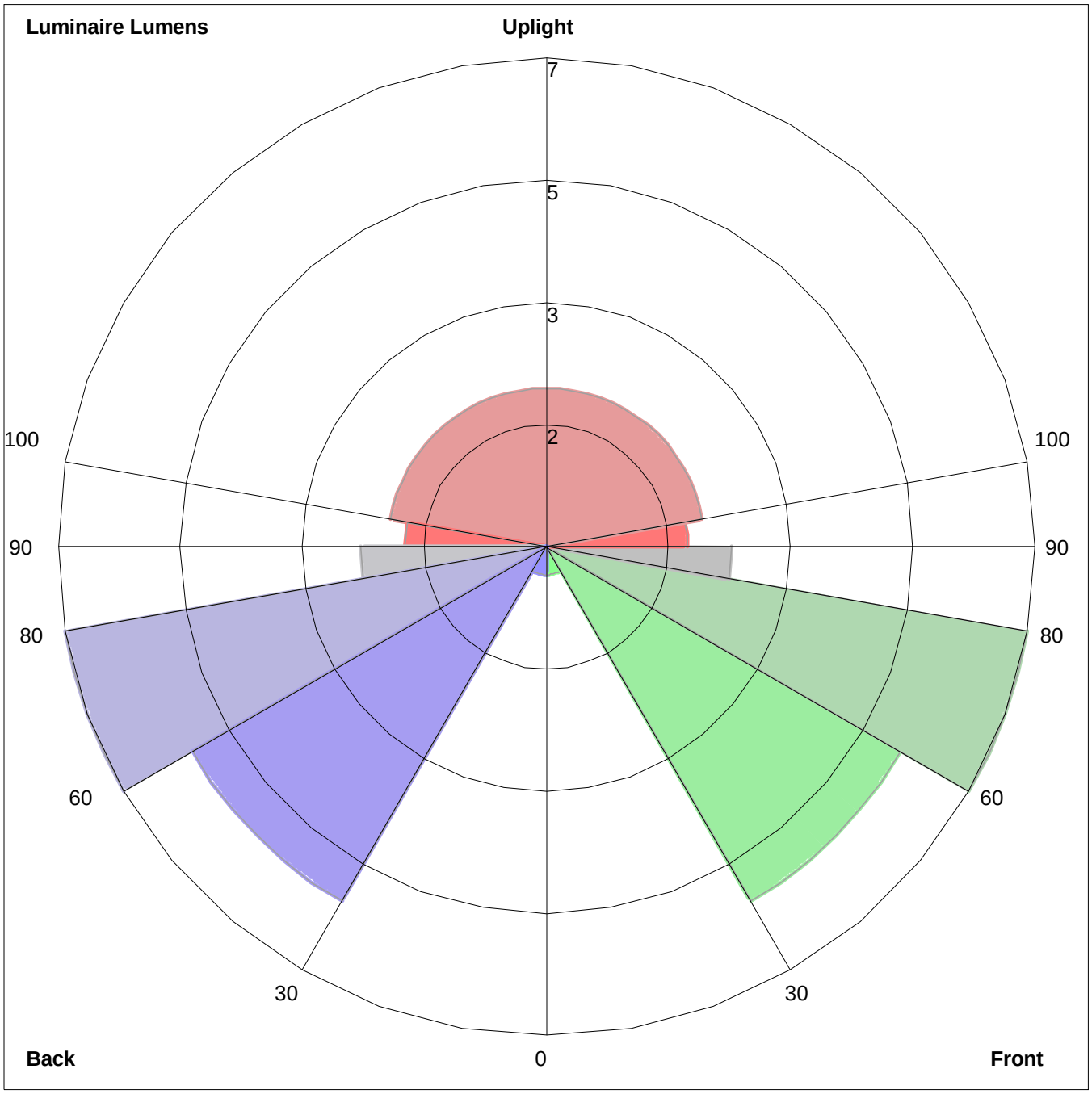
ISOFOOTCANDLE LINES OF HORIZONTAL ILLUMINANCE



Distance In Units Of Mounting Height
Values Based On .083 Foot Mounting Height
1/2 Maximum Candela Trace Shown As Dashed Curve
(+) = Maximum Candela Point

IES ROAD REPORT
PHOTOMETRIC FILENAME : L021602104.IES

LUMINAIRE CLASSIFICATION SYSTEM (LCS) GRAPH



Luminaire Lumens:
Front: Low=0.4, Medium=5.7, High=6.9, Very High=2.6
Back: Low=0.4, Medium=5.7, High=6.9, Very High=2.6
Uplight: Low=2.0, High=2.2

BUG Rating : B0-U1-G0

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Results derived from content of manufacturers photometric file.

LIGHT LABORATORY INC.
8165 E Kaiser Blvd. Anaheim, CA 92808
www.lightlaboratory.com

NVLAP TESTING
NVLAP LAB CODE 200927-0

Report No: L062310802

Issue Date: 6/21/2023
Reference:N/A
Amendment:N/A

Report Prepared For: FX Luminaire / Lumascape
1940 Diamond Street San Marcos, CA 92078

Model Number: FC-LED35WFL-GW-360-FW

Test: Photometric/Colorimetric/Electrical Test

Standards Used: Appropriate part or all test guidelines were used for test performed:

IESNA LM79: 2019 Approved Methods for Electrical and Photometric Measurements of Solid-State Lighting Products

ANSI NEMA ANSLG C78.377: 2017 Specification of the Chromaticity of Solid State Lighting Products

ANSI C82.77-10:2014: 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.

Special Test Condition: Fixture is tested with no special conditions.

Date of Tests: 6/20/23

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-S4	4/7/25
HP Power Supply	6032A	PS-DC05-S2	--
Fluke Digital Thermometer	52K/J	MT-TP05	1/11/2024
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

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NVLAP TESTING
NVLAP LAB CODE 200927-0

General Information	
Manufacturer:	FX Luminaire / Lumascape
Model Number:	FC-LED35WFL-GW-360-FW
Driver Model Number:	N/A

Test Summary	
Total Lumens:	13.00
Efficacy:	4.28
Color Redering Index:	86.3
Correlated Color Temperature:	2633
Input Voltage (VAC/60Hz):	12.00
Input Current (Amp):	0.2737
Input Power (W):	3.04
Input Power Factor:	0.9250
Current ATHD (%):	36.4%

Test Condition	
Ambient Temperature (°C):	25.0
Stabilization Time (Hours):	1:15
Total Operating Time (Hours):	1:55

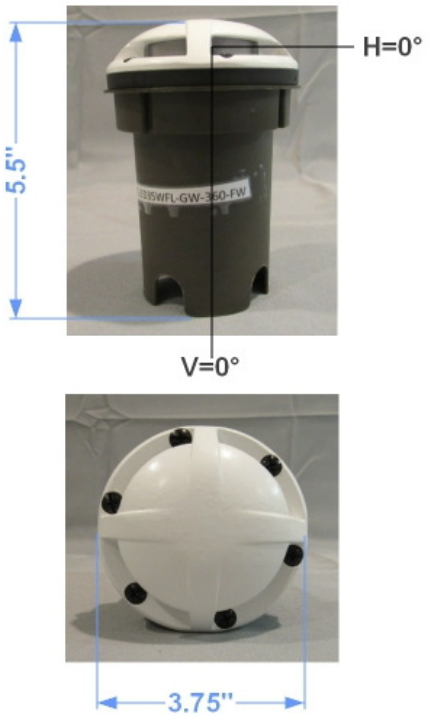


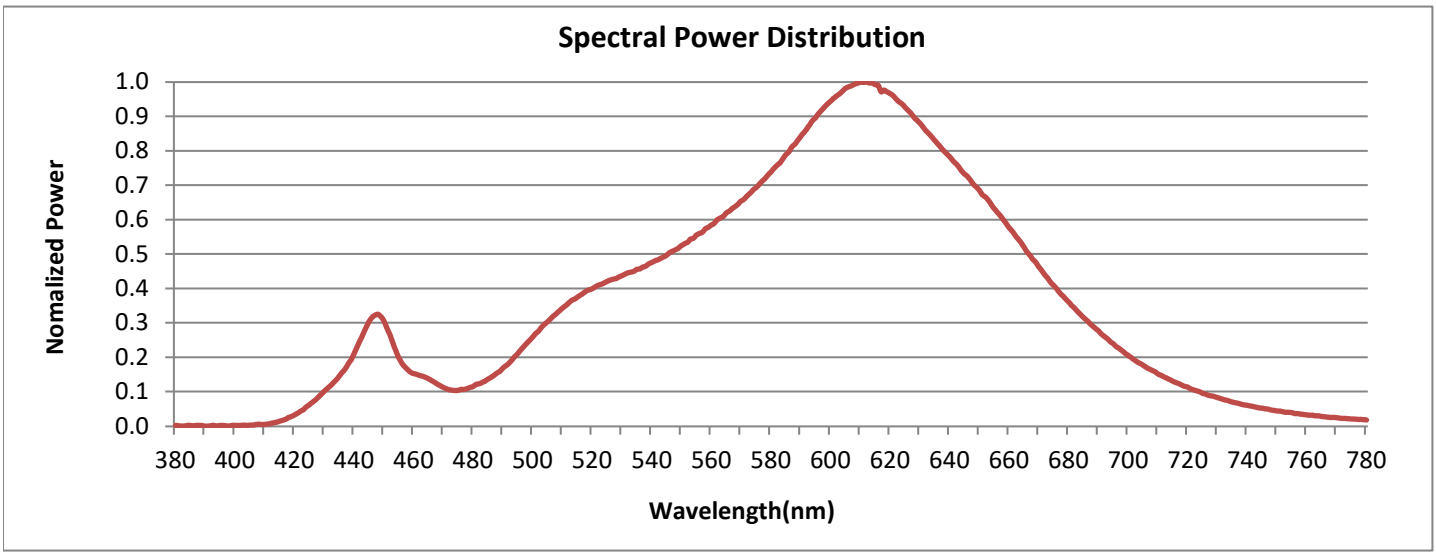
FIG. 1 LUMINAIRE

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Report No: L062310802

NVLAP TESTING
NVLAP LAB CODE 200927-0

Colorimetry Test Results

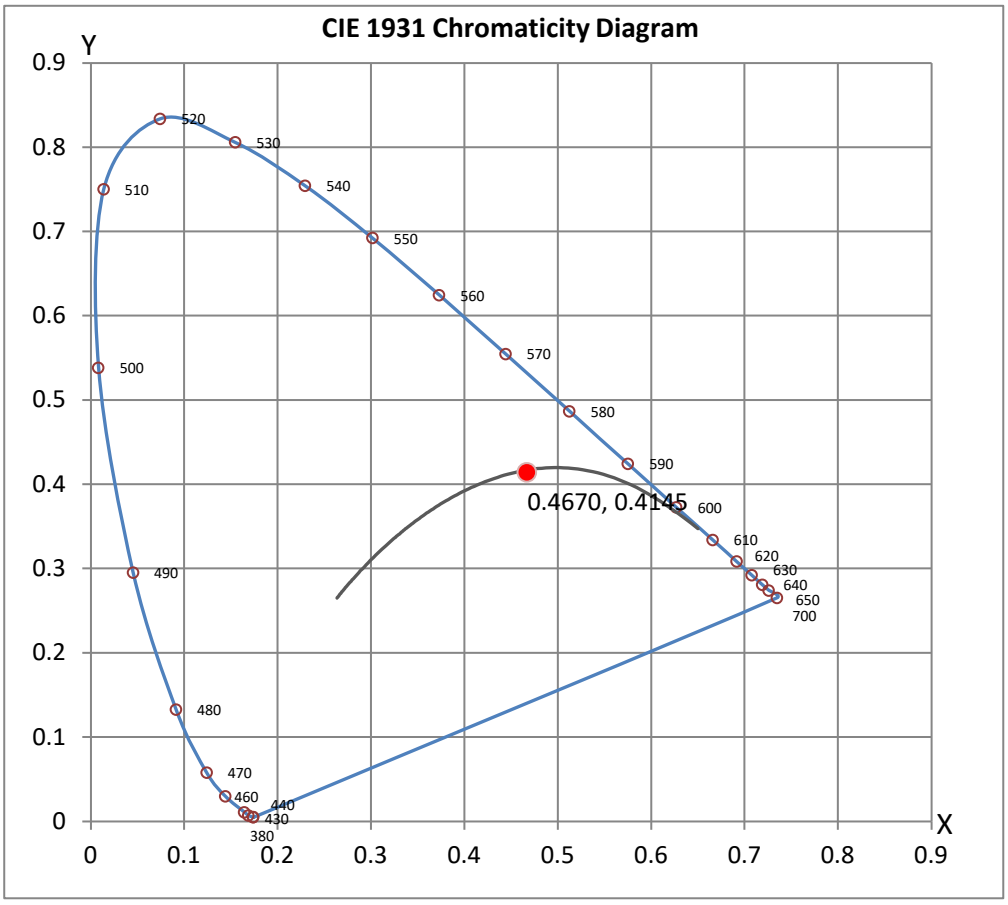


CRI & CCT

x	0.4670
y	0.4145
u'	0.2653
v'	0.5299
CRI	86.30
CCT	2633
Duv	0.00088

R Values

R1	85.23
R2	91.87
R3	98.06
R4	87.01
R5	85.69
R6	92.08
R7	85.56
R8	65.07
R9	23.61
R10	81.76
R11	88.34
R12	80.04
R13	86.63
R14	98.48
R15	77.70



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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:

The results related only to the samples as received and tested. This report must not be used by the customer to claim product certification, approval or endorsement by NVLAP, NIST or any agency of the Federal Government.

Report Prepared by : Kunjan Modi

Test Report Reviewed by:

Steve Kang
Quality Assurance

**Attached are photometric data reports.*

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8165 E. Kaiser Blvd. Anaheim, CA 92808
www.lightlaboratory.com

Photometric Test Report

IES ROAD REPORT
PHOTOMETRIC FILENAME : L062310802.IES

DESCRIPTIVE INFORMATION (From Photometric File)

IESNA:LM-63-2002
[TEST] L062310802
[TESTLAB] LIGHT LABORATORY, INC. (www.lightlaboratory.com)
[ISSUEDATE] 6/21/2023
[MANUFAC] FX Luminaire / Lumascape
[LUMCAT] FC-LED35WFL-GW-360-FW
[LUMINAIRE] FC 35W Ground Wash Flat White
[BALLASTCAT] N/A
[OTHER] INDICATING THE CANDELA VALUES ARE ABSOLUTE AND
[MORE] SHOULD NOT BE FACTORED FOR DIFFERENT LAMP RATINGS.
[INPUT] 12 VAC
[TEST PROCEDURE] IESNA:LM-79-19

CHARACTERISTICS

IES Classification	N.A.
Longitudinal Classification	N.A.
Lumens Per Lamp	N.A. (absolute)
Total Lamp Lumens	N.A. (absolute)
Luminaire Lumens	13
Downward Total Efficiency	N.A. (absolute)
Total Luminaire Efficiency	N.A. (absolute)
Luminaire Efficacy Rating (LER)	0
Total Luminaire Watts	30.4
Ballast Factor	1.00
Upward Waste Light Ratio	0.63
Maximum Candela	3.05
Maximum Candela Angle	30H 90V
Maximum Candela (<90 Degrees Vertical)	2.85
Maximum Candela Angle (<90 Degrees Vertical)	55H 85V
Maximum Candela At 90 Degrees Vertical	3.05 (23.5% Luminaire Lumens)
Maximum Candela from 80 to <90 Degrees Vertical	2.85 (21.9% Luminaire Lumens)
Cutoff Classification (deprecated)	N.A. (absolute)

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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 ROAD REPORT
PHOTOMETRIC FILENAME : L062310802.IES

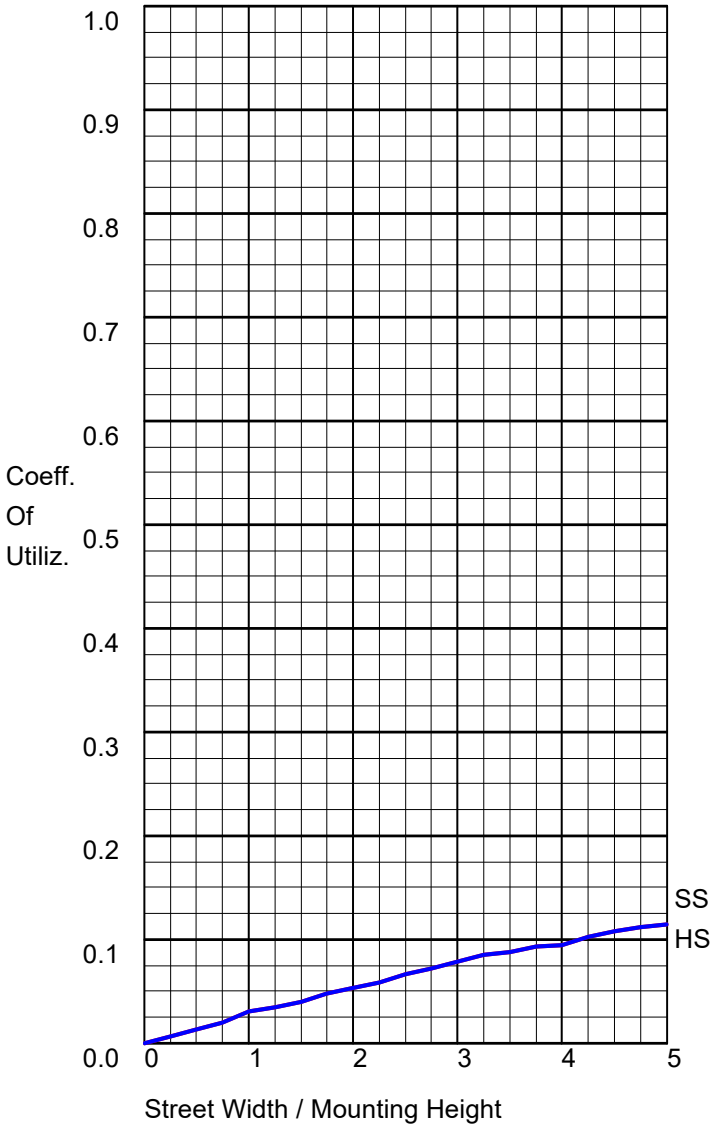
LUMINAIRE CLASSIFICATION SYSTEM (LCS)

	Lumens	% Lamp	% Luminaire
FL - Front-Low (0-30)	< 0.05	N.A.	0.2
FM - Front-Medium (30-60)	0.1	N.A.	0.8
FH - Front-High (60-80)	1.0	N.A.	7.6
FVH - Front-Very High (80-90)	1.3	N.A.	9.8
BL - Back-Low (0-30)	< 0.05	N.A.	0.2
BM - Back-Medium (30-60)	0.1	N.A.	0.8
BH - Back-High (60-80)	1.0	N.A.	7.6
BVH - Back-Very High (80-90)	1.3	N.A.	9.8
UL - Uplight-Low (90-100)	2.5	N.A.	19.2
UH - Uplight-High (100-180)	5.8	N.A.	44.5
Total	13.1	N.A.	100.0
BUG Rating	B0-U1-G0		

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Results derived from content of manufacturers photometric file.

IES ROAD REPORT
PHOTOMETRIC FILENAME : L062310802.IES

COEFFICIENTS OF UTILIZATION



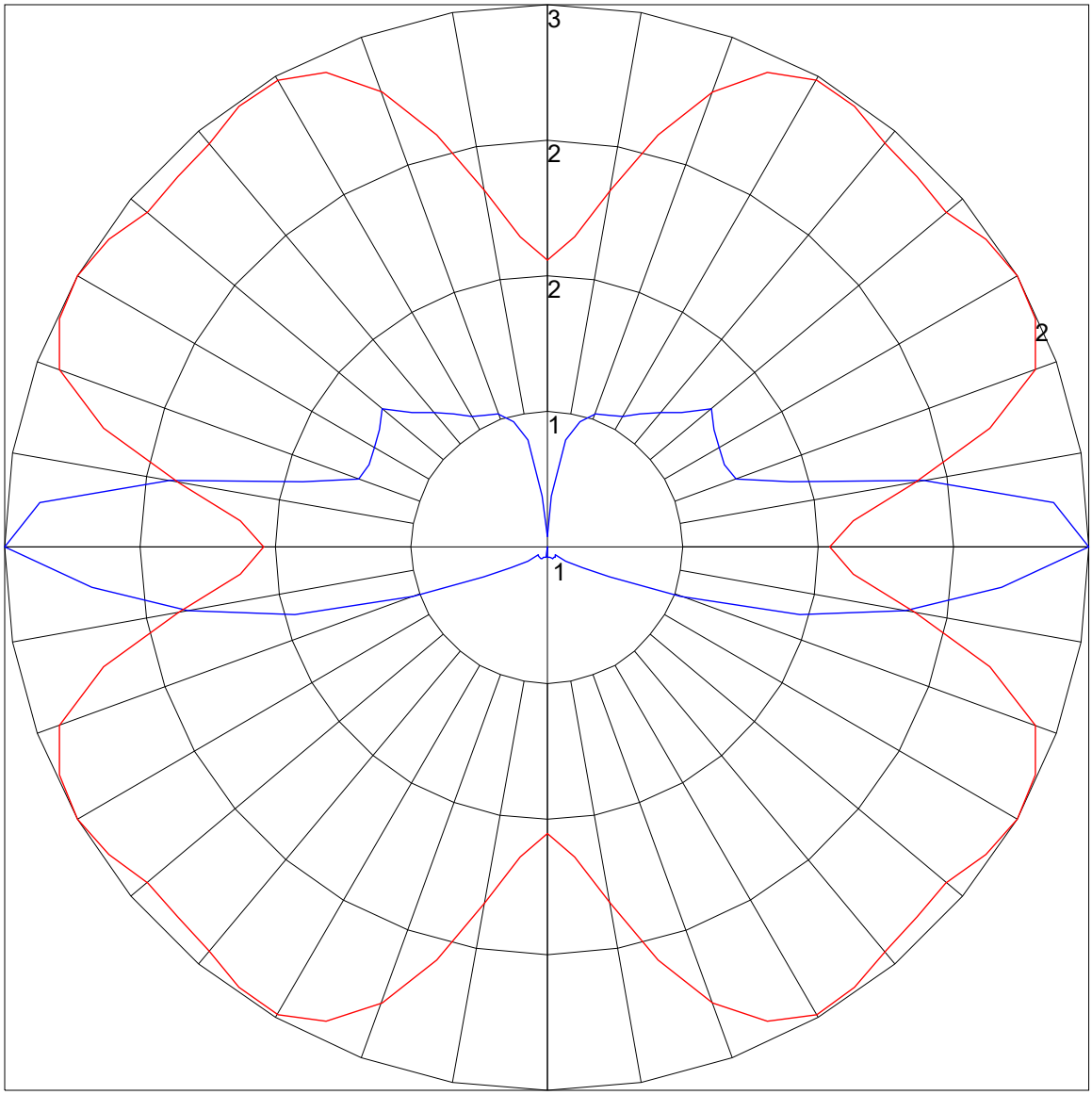
FLUX DISTRIBUTION

	Lumens	Percent Of Luminaire
Downward Street Side	2.4	18.3
Downward House Side	2.4	18.3
Downward Total	4.8	36.4
Upward Street Side	4.2	31.7
Upward House Side	4.2	31.7
Upward Total	8.4	63.7
Total Flux	13.2	100.1

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IES ROAD REPORT
PHOTOMETRIC FILENAME : L062310802.IES

POLAR GRAPH

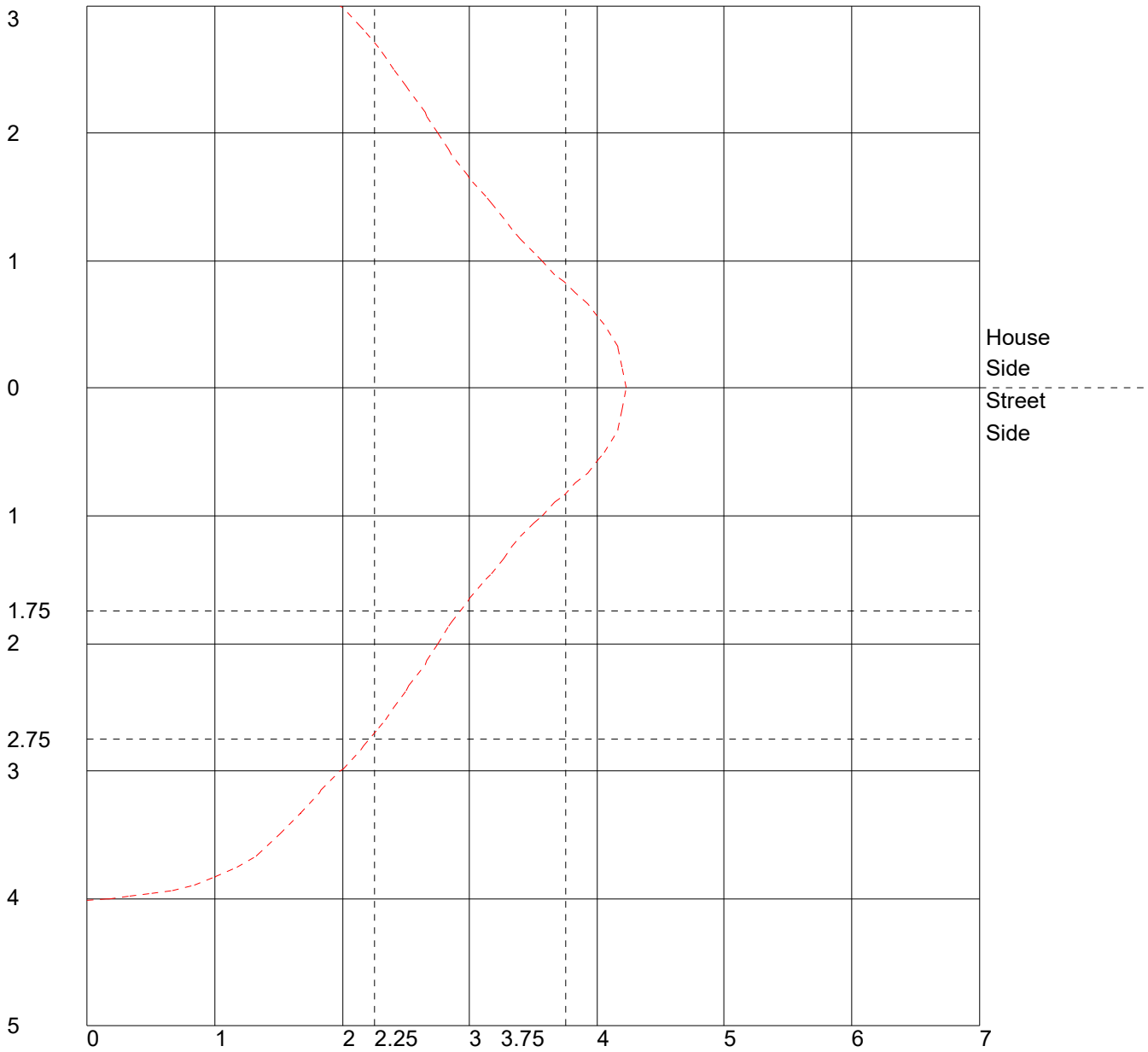


Maximum Candela = 3.05 Located At Horizontal Angle = 30, Vertical Angle = 90
1 - Vertical Plane Through Horizontal Angles (30 - 210) (Through Max. Cd.)
2 - Horizontal Cone Through Vertical Angle (90) (Through Max. Cd.)

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Results derived from content of manufacturers photometric file.

IES ROAD REPORT
PHOTOMETRIC FILENAME : L062310802.IES

ISOFOOTCANDLE LINES OF HORIZONTAL ILLUMINANCE



Distance In Units Of Mounting Height
Values Based On 10 Foot Mounting Height
1/2 Maximum Candela Trace Shown As Dashed Curve
(+) = Maximum Candela Point

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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.

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

Report No: L101410420
Date: 11/12/2014

NVLAP LAB CODE 200927-0

Report No: **L101410420**

Report Prepared For: Hunter Industries
1775 Diamond Street, San Marcos, CA. 92078

Model Number: **FCZDC3LEDCWBS**

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 FCZDC3LEDCWBS . Received in working and undamaged condition. No modifications were necessary.

Testing Condition: Fixture is tested with no special conditions.

Sample Arrival Date: 11/7/14

Date of Tests: 11/11/14 - 11/12/14

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	01/04/15
Xitron Power Analysis System	2503AH	MT-EL01	01/09/15
BK Precision DC Power Supply	1747	PSDC-04	01/08/15
Fluke Digital Thermometer	52k/J	MT-TP02-GC	01/04/15
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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Report No: L101410420
Date: 11/12/2014

NVLAP LAB CODE 200927-0

Test Summary	
Manufacturer:	Hunter Industries
Model Number:	FCZDC3LEDCWBS
Driver Model Number:	N/A
Total Lumens:	128.97
Input Voltage (VAC/60Hz):	12.00
Input Current (Amp):	0.48
Input Power (W):	5.28
Input Power Factor:	0.93
Current ATHD @ 12V(%):	39%
Current ATHD @ 277V(%):	N/A
Efficacy:	24
Color Rendering Index (CRI):	83
Correlated Color Temperature (K):	3709
Chromaticity Coordinate x:	0.3948
Chromaticity Coordinate y:	0.3867
Ambient Temperature (°F):	77.0
Stabilization Time (Hours):	0:45
Total Operating Time (Hours):	1:45
Off State Power(W):	0.00

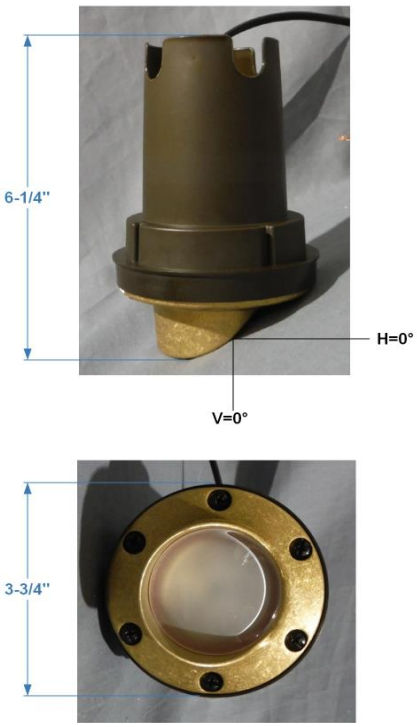


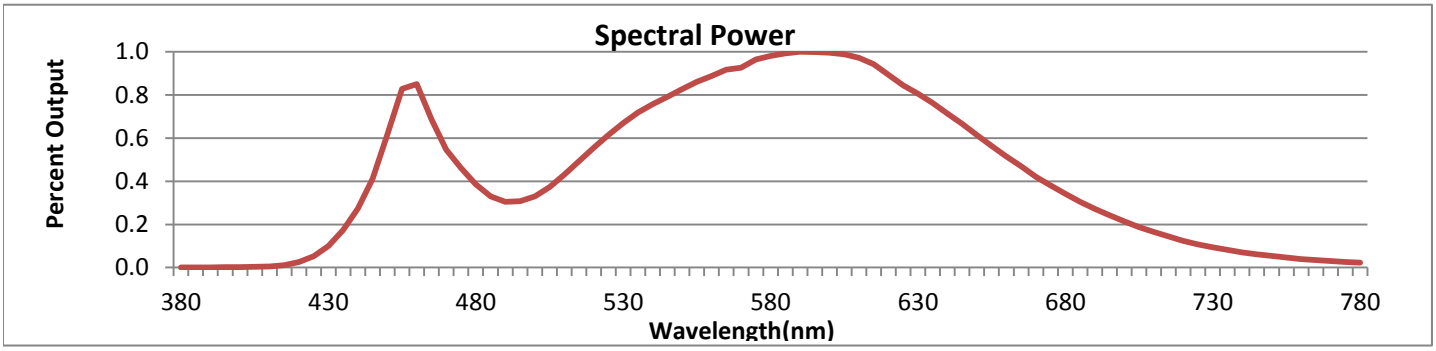
FIG. 1 LUMINAIRE

*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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Report No: L101410420
Date: 11/12/2014

NVLAP LAB CODE 200927-0



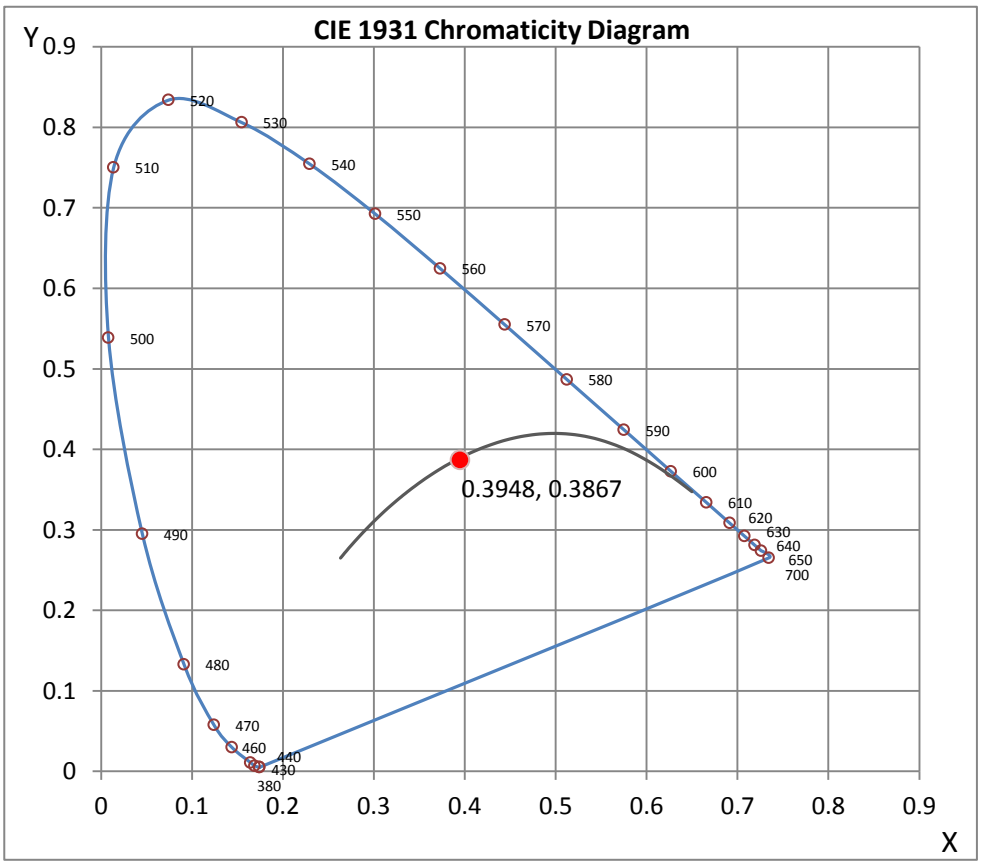
Wavelength	W/m²nm	440	0.2732	510	0.4310	580	0.9817	650	0.6152	720	0.1238
380	0.0011	450	0.6163	520	0.5561	590	1.0000	660	0.5151	730	0.0940
390	0.0010	460	0.8510	530	0.6693	600	0.9967	670	0.4211	740	0.0708
400	0.0016	470	0.5461	540	0.7576	610	0.9731	680	0.3411	750	0.0533
410	0.0053	480	0.3870	550	0.8266	620	0.8935	690	0.2726	760	0.0394
420	0.0250	490	0.3052	560	0.8881	630	0.8059	700	0.2138	770	0.0300
430	0.1007	500	0.3295	570	0.9263	640	0.7141	710	0.1657	780	0.0226

CRI & CCT

x	0.3948
y	0.3867
u'	0.2305
v'	0.5080
CRI	82.70
CCT	3709
Duv	0.00068

R Values

R1	81.23
R2	90.37
R3	94.87
R4	77.92
R5	79.19
R6	84.50
R7	86.62
R8	66.81
R9	18.97
R10	74.26
R11	73.22
R12	58.12
R13	83.56
R14	96.75



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

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

Report No: L101410420
Date: 11/12/2014

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

Photometric Test Report

IES FLOOD REPORT
PHOTOMETRIC FILENAME : L101410420.IES

DESCRIPTIVE INFORMATION (From Photometric File)

IESNA:LM-63-2002
[TEST] L101410420
[TESTLAB] LIGHT LABORATORY, INC.
[ISSUEDATE] 11/12/2014
[MANUFAC] HUNTER INDUSTRIES
[LUMCAT] FCZDC3LEDCWBS
[LUMINAIRE] 3-3/4"DIA. X 6-1/4"H. LED FIXTURE
[MORE] DIFFUSED LENS
[BALLASTCAT] N.A.
[BALLAST] 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, 5.28W
[_TEST PROCEDURE] IESNA:LM-79-08

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

CHARACTERISTICS

NEMA Type	5 H x 5 V
Maximum Candela	145.85
Maximum Candela Angle	0H 3V
Horizontal Beam Angle (50%)	47.7
Vertical Beam Angle (50%)	49.6
Horizontal Field Angle (10%)	93.4
Vertical Field Angle (10%)	95.8
Lumens Per Lamp	N.A. (absolute)
Total Lamp Lumens	N.A. (absolute)
Beam Lumens	61
Beam Efficiency	N.A.
Field Lumens	111
Field Efficiency	N.A.
Spill Lumens	18
Luminaire Lumens	128.97
Total Efficiency	N.A.
Total Luminaire Watts	5.28
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 : L101410420.IES

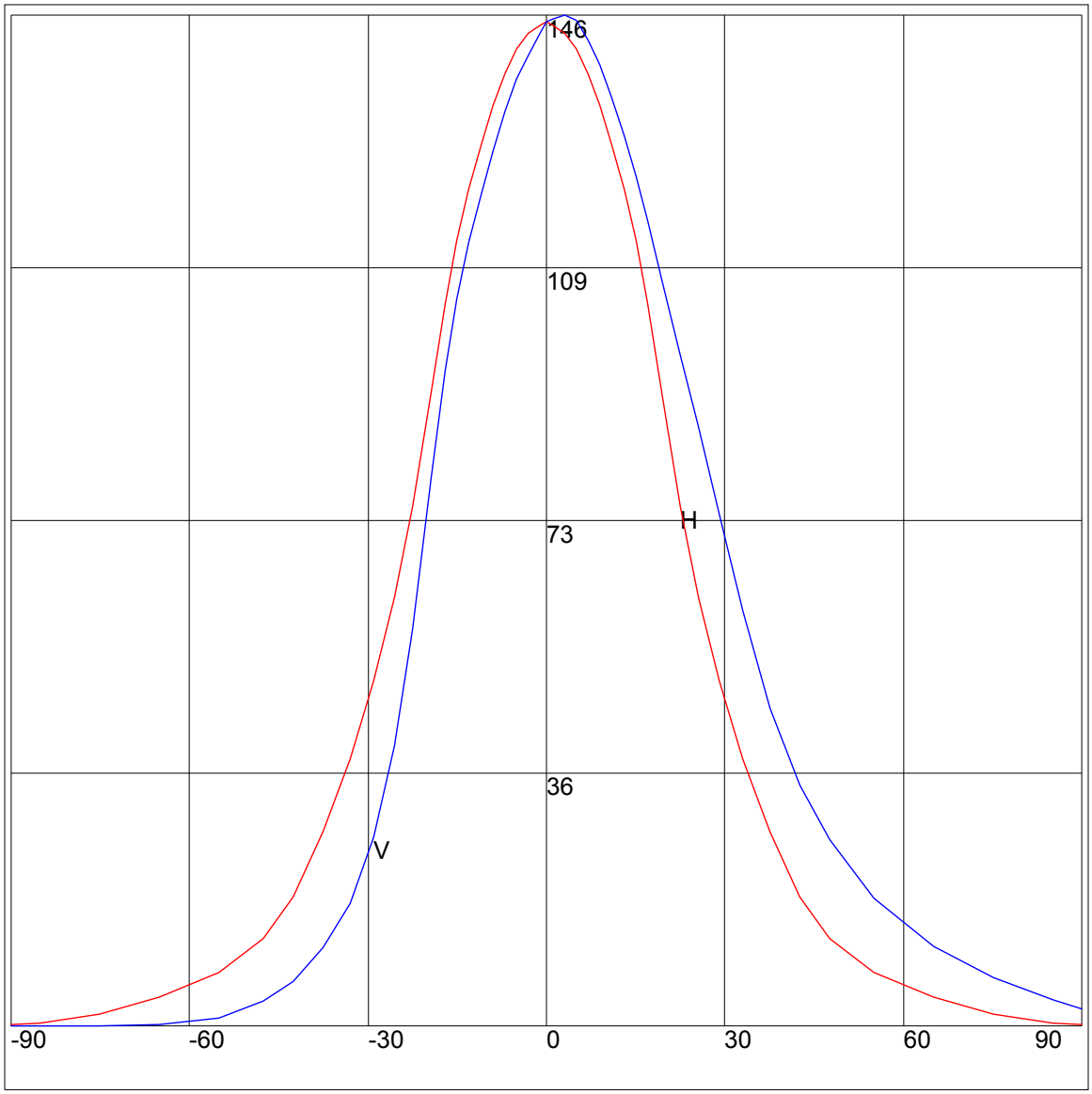
AXIAL CANDELA

DEG.	HOR.	DEG.	VERT.
90	.21	90	2.51
85	.5	85	3.78
75	1.85	75	7
65	4.15	65	11.46
55	7.71	55	18.57
47.5	12.58	47.5	26.87
42.5	18.77	42.5	34.87
37.5	28.13	37.5	45.99
33	38.61	33	60.08
29	49.88	29	73.97
25.5	61.95	25.5	86.4
22.5	75.02	22.5	96.85
19.5	91.19	19.5	107.54
17	104.09	17	116.11
15	113.39	15	122.52
13	120.74	13	128.44
11	127.24	11	133.95
9	132.84	9	138.65
7	137.44	7	142.37
5	140.88	5	145.14
3	143.18	3	145.85
1	144.42	1	145.33
0	144.86	0	144.86
-1	144.42	-1	143.24
-3	143.18	-3	139.97
-5	140.88	-5	136.63
-7	137.44	-7	131.96
-9	132.84	-9	126.4
-11	127.24	-11	120.09
-13	120.74	-13	113
-15	113.39	-15	104.95
-17	104.09	-17	94.48
-19.5	91.19	-19.5	78.88
-22.5	75.02	-22.5	57.45
-25.5	61.95	-25.5	40.52
-29	49.88	-29	27.34
-33	38.61	-33	17.74
-37.5	28.13	-37.5	11.33
-42.5	18.77	-42.5	6.42
-47.5	12.58	-47.5	3.6
-55	7.71	-55	1.3
-65	4.15	-65	.21
-75	1.85	-75	0
-85	.5	-85	0
-90	.21	-90	0

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IES FLOOD REPORT
PHOTOMETRIC FILENAME : L101410420.IES

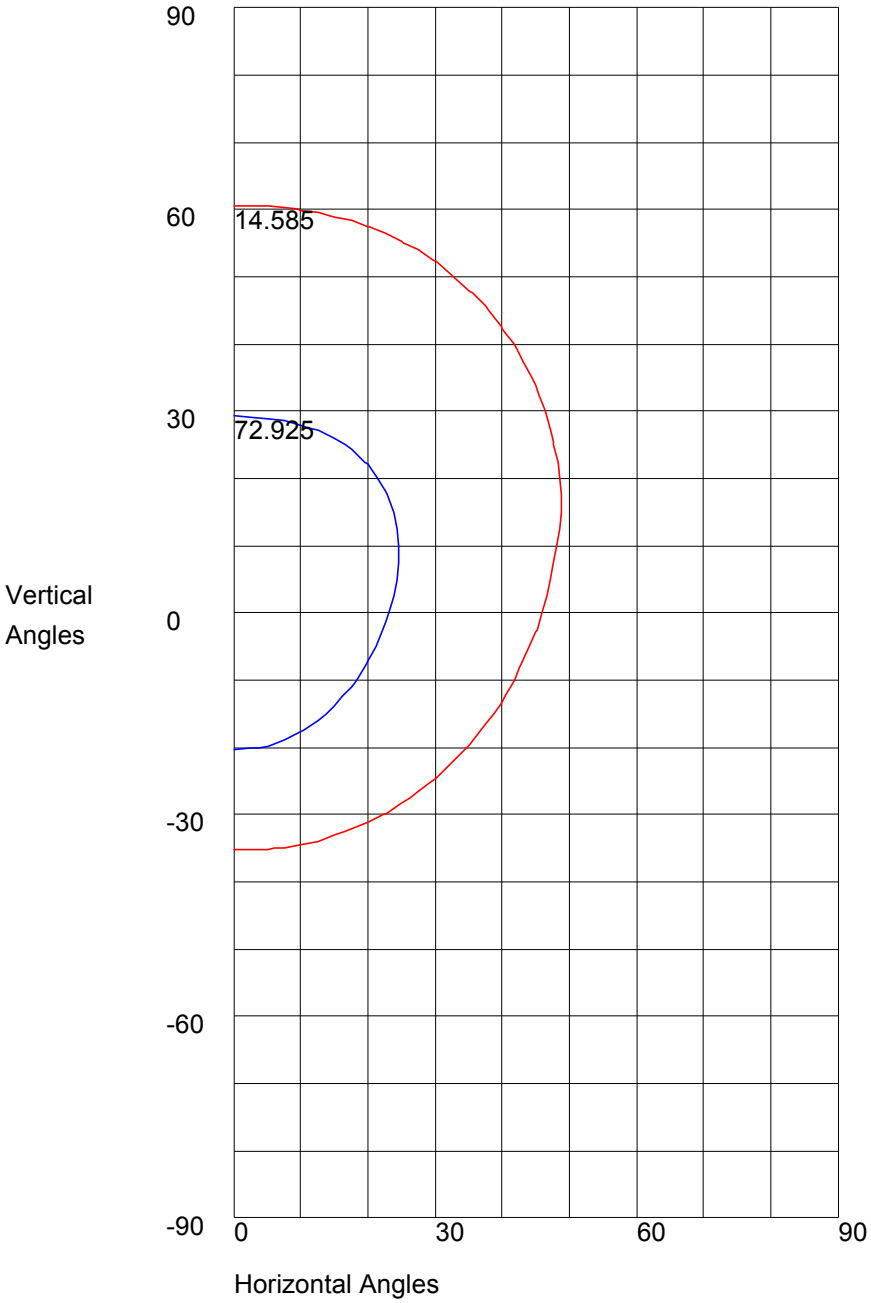
AXIAL CANDELA DISPLAY



Maximum Candela = 145.85 Located At Horizontal Angle = 0, Vertical Angle = 3
H - Horizontal Axial Candela
V - Vertical Axial Candela

IES FLOOD REPORT
PHOTOMETRIC FILENAME : L101410420.IES

ISOCANDELA CURVES



Maximum Candela = 145.85 Located At Horizontal Angle = 0, Vertical Angle = 3
50% Maximum Candela = 72.925
10% Maximum Candela = 14.585

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www.lightlaboratory.com

NVLAP TESTING
NVLAP LAB CODE 200927-0

Report No: L062310803

Issue Date: 6/21/2023
Reference:N/A
Amendment:N/A

Report Prepared For: FX Luminaire / Lumascape
1940 Diamond Street San Marcos, CA 92078

Model Number: FC-LED50WFL-GW-360-FW

Test: Photometric/Colorimetric/Electrical Test

Standards Used: Appropriate part or all test guidelines were used for test performed:

IESNA LM79: 2019 Approved Methods for Electrical and Photometric Measurements of Solid-State Lighting Products

ANSI NEMA ANSLG C78.377: 2017 Specification of the Chromaticity of Solid State Lighting Products

ANSI C82.77-10:2014: 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.

Special Test Condition: Fixture is tested with no special conditions.

Date of Tests: 6/20/23

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-S4	4/7/25
HP Power Supply	6032A	PS-DC05-S2	--
Fluke Digital Thermometer	52K/J	MT-TP05	1/11/2024
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

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NVLAP TESTING
NVLAP LAB CODE 200927-0

General Information	
Manufacturer:	FX Luminaire / Lumascape
Model Number:	FC-LED50WFL-GW-360-FW
Driver Model Number:	N/A

Test Summary	
Total Lumens:	16.00
Efficacy:	4.68
Color Redering Index:	86.7
Correlated Color Temperature:	2619
Input Voltage (VAC/60Hz):	12.00
Input Current (Amp):	0.3101
Input Power (W):	3.42
Input Power Factor:	0.9183
Current ATHD (%):	37.3%

Test Condition	
Ambient Temperature (°C):	25.0
Stabilization Time (Hours):	1:20
Total Operating Time (Hours):	2:00

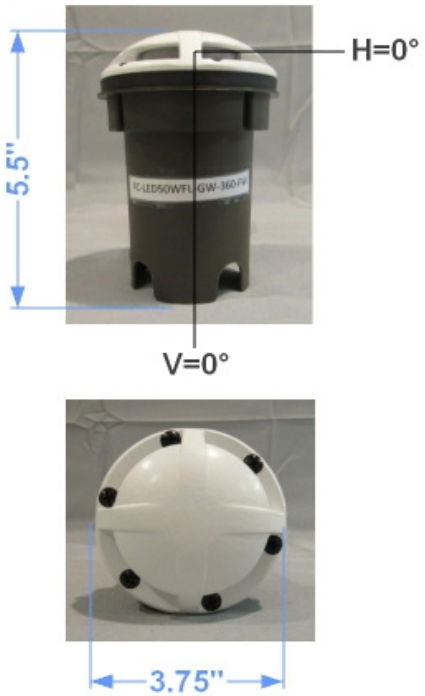


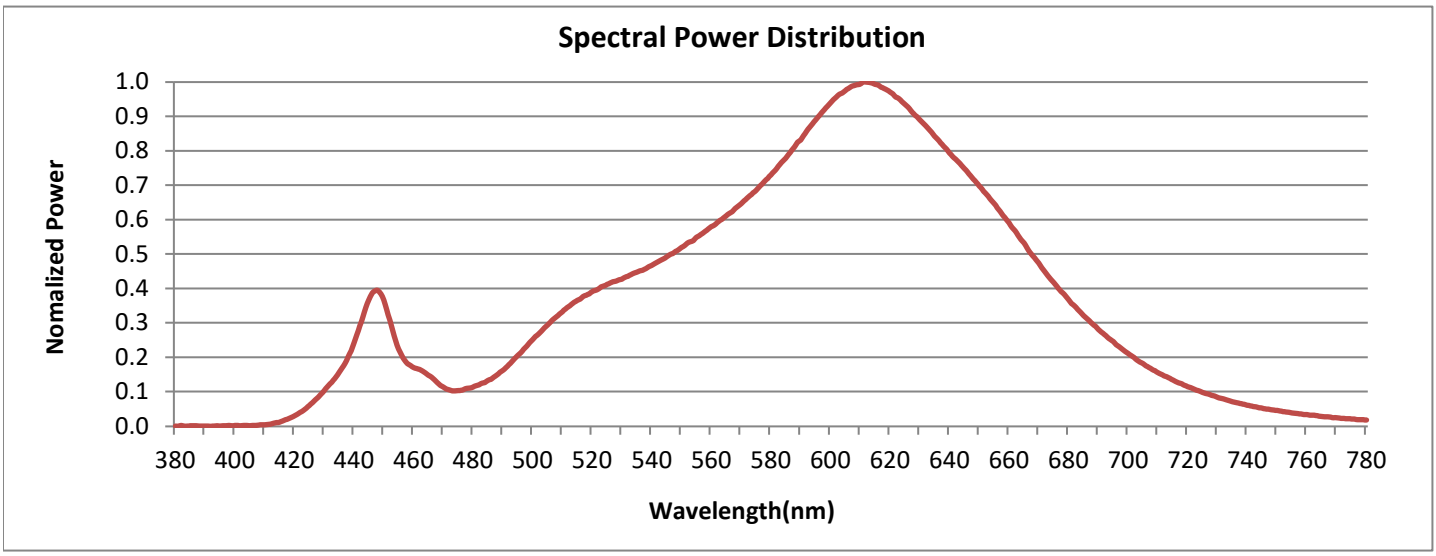
FIG. 1 LUMINAIRE

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Report No: L062310803

NVLAP TESTING
NVLAP LAB CODE 200927-0

Colorimetry Test Results

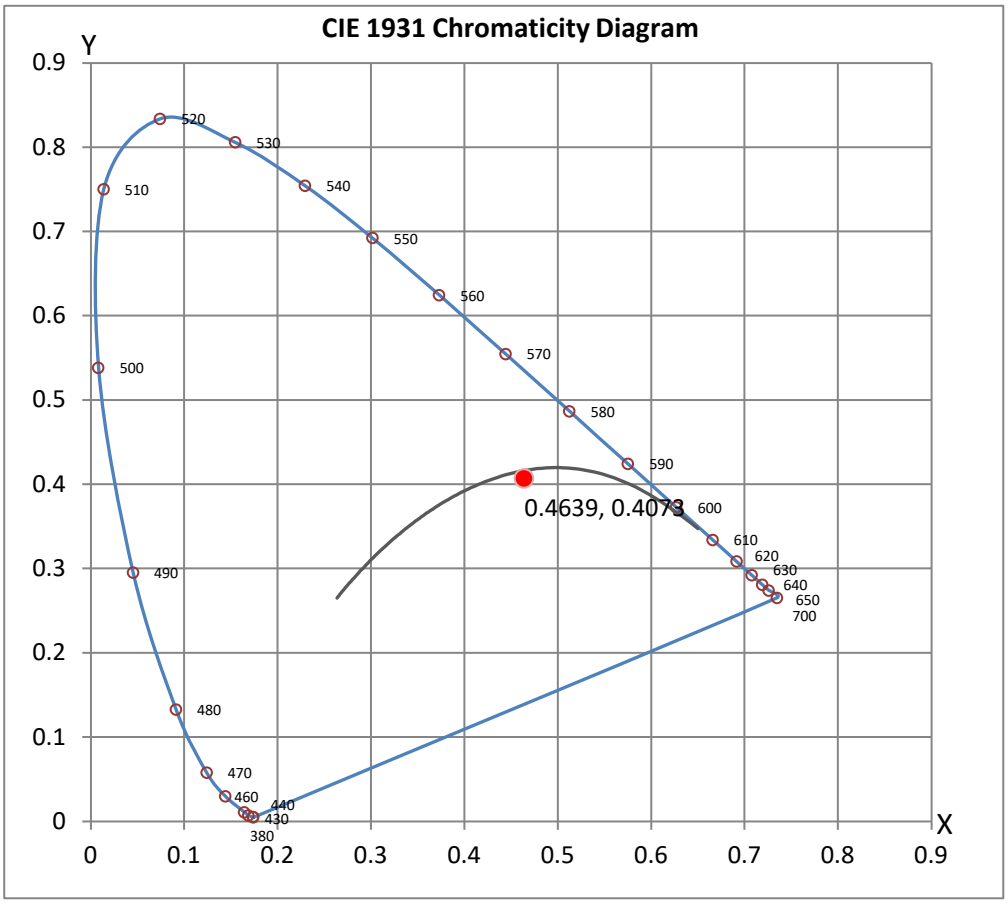


CRI & CCT

x	0.4639
y	0.4073
u'	0.2666
v'	0.5267
CRI	86.70
CCT	2619
Duv	-0.00151

R Values

R1	86.12
R2	92.61
R3	97.53
R4	86.96
R5	86.59
R6	92.79
R7	85.02
R8	66.00
R9	27.02
R10	83.19
R11	88.29
R12	81.88
R13	87.59
R14	98.33
R15	79.23



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NVLAP TESTING
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Test Methods

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Electrical measurements are measured using the listed equipment.

Disclaimers:

The results related only to the samples as received and tested. This report must not be used by the customer to claim product certification, approval or endorsement by NVLAP, NIST or any agency of the Federal Government.

Report Prepared by : Kunjan Modi

Test Report Reviewed by:

Steve Kang
Quality Assurance

**Attached are photometric data reports.*

LIGHT LABORATORY INC.
8165 E. Kaiser Blvd. Anaheim, CA 92808
www.lightlaboratory.com

Photometric Test Report

IES ROAD REPORT
PHOTOMETRIC FILENAME : L062310803.IES

DESCRIPTIVE INFORMATION (From Photometric File)

IESNA:LM-63-2002
[TEST] L062310803
[TESTLAB] LIGHT LABORATORY, INC. (www.lightlaboratory.com)
[ISSUEDATE] 6/21/2023
[MANUFAC] FX Luminaire / Lumascape
[LUMCAT] FC-LED50WFL-GW-360-FW
[LUMINAIRE] FC 50W Ground Wash Flat White
[BALLASTCAT] N/A
[OTHER] INDICATING THE CANDELA VALUES ARE ABSOLUTE AND
[MORE] SHOULD NOT BE FACTORED FOR DIFFERENT LAMP RATINGS.
[INPUT] 12 VAC
[TEST PROCEDURE] IESNA:LM-79-19

CHARACTERISTICS

IES Classification	N.A.
Longitudinal Classification	N.A.
Lumens Per Lamp	N.A. (absolute)
Total Lamp Lumens	N.A. (absolute)
Luminaire Lumens	16
Downward Total Efficiency	N.A. (absolute)
Total Luminaire Efficiency	N.A. (absolute)
Luminaire Efficacy Rating (LER)	5
Total Luminaire Watts	3.42
Ballast Factor	1.00
Upward Waste Light Ratio	0.62
Maximum Candela	4.14
Maximum Candela Angle	30H 90V
Maximum Candela (<90 Degrees Vertical)	3.82
Maximum Candela Angle (<90 Degrees Vertical)	45H 85V
Maximum Candela At 90 Degrees Vertical	4.14 (25.9% Luminaire Lumens)
Maximum Candela from 80 to <90 Degrees Vertical	3.82 (23.9% Luminaire Lumens)
Cutoff Classification (deprecated)	N.A. (absolute)

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IES ROAD REPORT
PHOTOMETRIC FILENAME : L062310803.IES

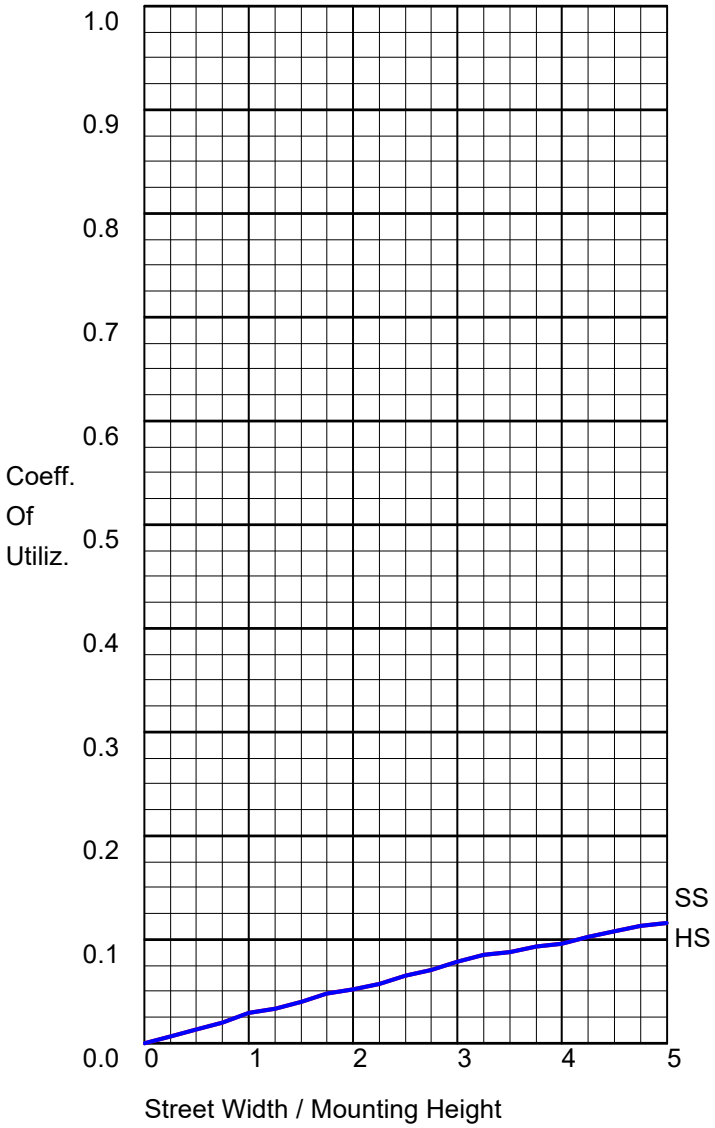
LUMINAIRE CLASSIFICATION SYSTEM (LCS)

	Lumens	% Lamp	% Luminaire
FL - Front-Low (0-30)	< 0.05	N.A.	0.2
FM - Front-Medium (30-60)	0.1	N.A.	0.8
FH - Front-High (60-80)	1.2	N.A.	7.7
FVH - Front-Very High (80-90)	1.7	N.A.	10.8
BL - Back-Low (0-30)	< 0.05	N.A.	0.2
BM - Back-Medium (30-60)	0.1	N.A.	0.8
BH - Back-High (60-80)	1.2	N.A.	7.7
BVH - Back-Very High (80-90)	1.7	N.A.	10.8
UL - Uplight-Low (90-100)	3.5	N.A.	22.0
UH - Uplight-High (100-180)	6.4	N.A.	40.5
Total	15.9	N.A.	100.0
BUG Rating	B0-U1-G0		

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PHOTOMETRIC FILENAME : L062310803.IES

COEFFICIENTS OF UTILIZATION



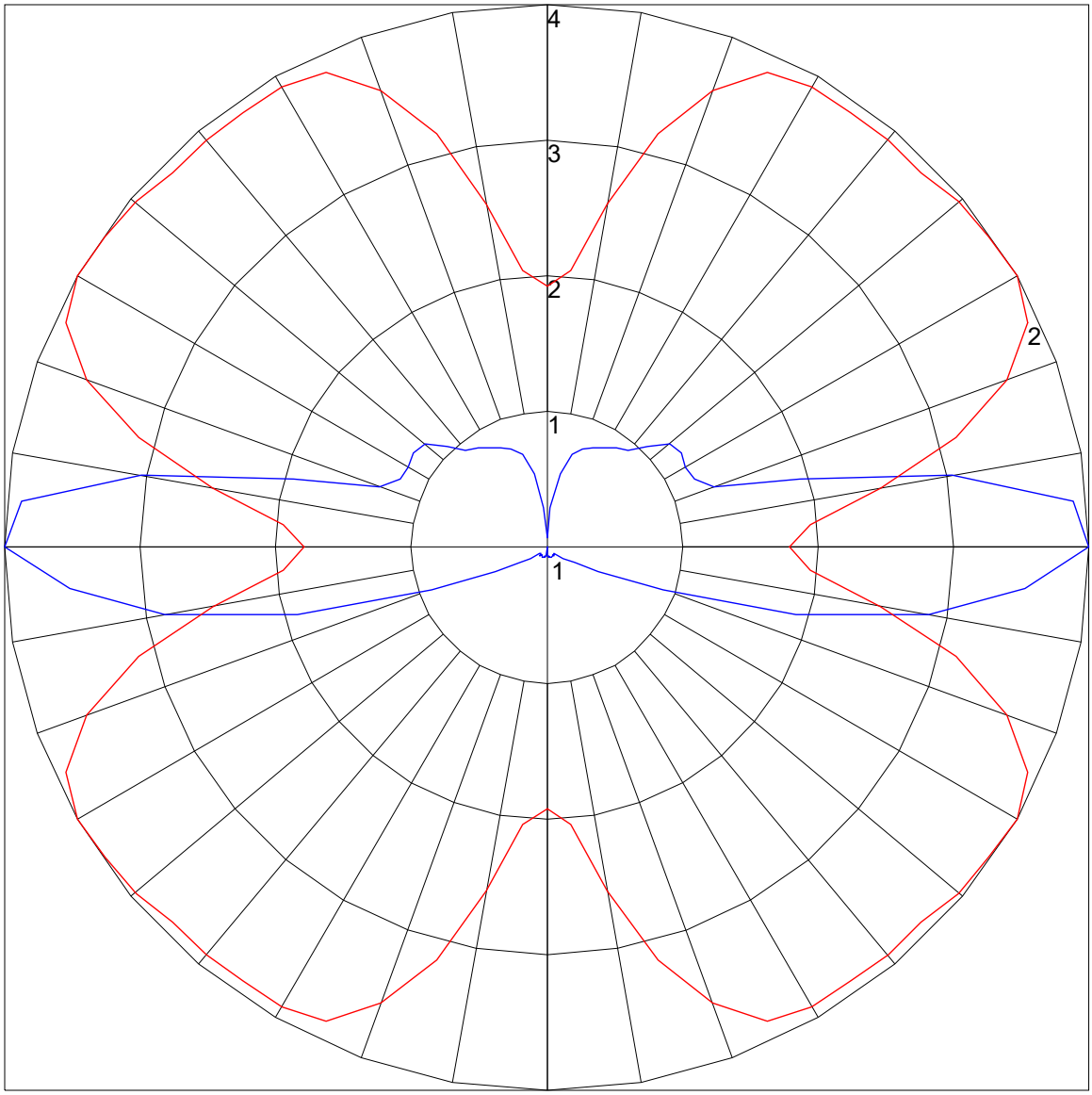
FLUX DISTRIBUTION

	Lumens	Percent Of Luminaire
Downward Street Side	3.1	19.2
Downward House Side	3.1	19.2
Downward Total	6.2	38.4
Upward Street Side	5.0	30.8
Upward House Side	5.0	30.8
Upward Total	10.0	62.0
Total Flux	16.2	100.4

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POLAR GRAPH

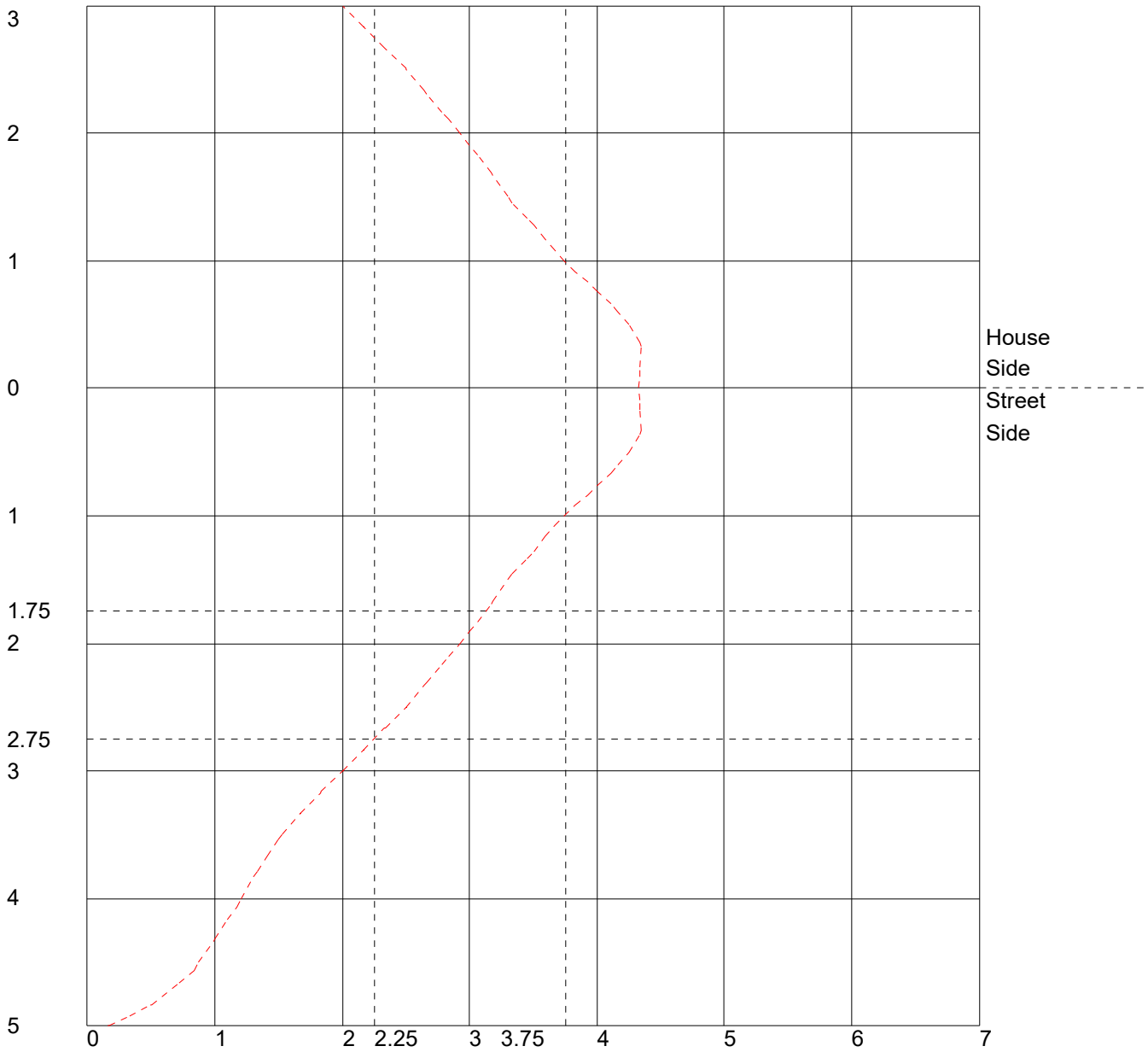


Maximum Candela = 4.14 Located At Horizontal Angle = 30, Vertical Angle = 90
1 - Vertical Plane Through Horizontal Angles (30 - 210) (Through Max. Cd.)
2 - Horizontal Cone Through Vertical Angle (90) (Through Max. Cd.)

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IES ROAD REPORT
PHOTOMETRIC FILENAME : L062310803.IES

ISOFOOTCANDLE LINES OF HORIZONTAL ILLUMINANCE



Distance In Units Of Mounting Height
Values Based On 10 Foot Mounting Height
1/2 Maximum Candela Trace Shown As Dashed Curve
(+) = Maximum Candela Point

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