Dialight OPTICS LABORATORY

NVLAP Lab Code 201033-0

Test Report

Report Number: L16062 Date: Aug 25, 2016

Issued by:
Dialight Optics Laboratory
1501 Route 34 South, Farmingdale, NJ 07727

Test of one Die Cast Floodlight
Unit manufacturer: Dialight Corporation
Unit model number: FLx244xC2NP

Issued to:
Dialight Corporation
1501 Route 34 South, Farmingdale, NJ 07727

Tests performed: Photometric characterization and temperature measurement per the described standards.

Dates of test: August 4, 2016 through August 10, 2016

Standards used: All tests are performed in accordance with procedures and guidelines prescribed by the American National Standards Institute (ANSI) or Illuminating Engineering Society of North America (IES):

- IES LM-79:2008: Electrical and Photometric Measurements of Solid-State Lighting Products
- ANSI/UL 1598:2008: Underwriters Laboratories Inc. Standard for Safety: Luminaires
- ENERGY STAR Manufacturer's Guide for Qualifying Solid State Lighting Luminaires Version 2.1

Description of sample:

Sample Number: L16062
Manufacturer: Dialight Corporation
Product Name: Die Cast Floodlight
Description: Die Cast Floodlight
Model Number: FLx244xC2NP

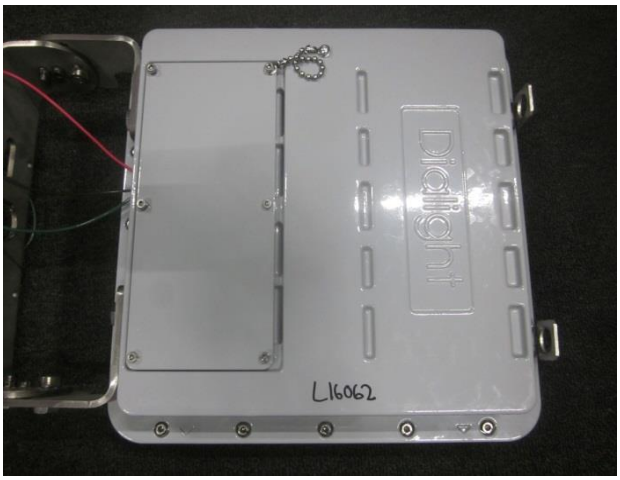
Dialight OPTICS LABORATORY

NVLAP Lab Code 201033-0

Report Summary

Sample number L16062
Dialight unit model number FLx244xC2NP

Photograph(s) of sample:



*Photographs not to scale. For reference only.

Summary of Results:

	Integrating Sphere	Goniophotometer
Luminous Flux:	10680 (lumens)	10743 (lumens)
Electrical Power:	102.3 (W)	102.1 (W)
Luminous Efficacy:	104.7 (lumens/W)	105.3 (lumens/W)

Electrical Measurements:

Input Power (120VAC):	102.3	(W)
Power Factor (120VAC):	0.995	
Current ATHD % (120VAC):	4.224	
Input Power (277VAC):	99.4	(W)
Power Factor (277VAC):	0.916	
Current ATHD % (277VAC):	8.337	

Color Measurements:

Correlated Color Temperature (CCT):	4913
Color Rendering Index (CRI):	74
Chromaticity Coordinate (x):	0.348
Chromaticity Coordinate (y):	0.361
Chromaticity Coordinate (u'):	0.21
Chromaticity Coordinate (v'):	0.327
DUV:	0.0034

Temperature Measurements:

In Situ LED Source Temperature:	72.2	(°C)

Dialight OPTICS LABORATORY

NVLAP Lab Code 201033-0

Test Results: Integrating Sphere

Results include unit color, flux, efficacy and electrical power for sample number L16062.
Dialight unit model number FLx244xC2NP

Test Conditions:

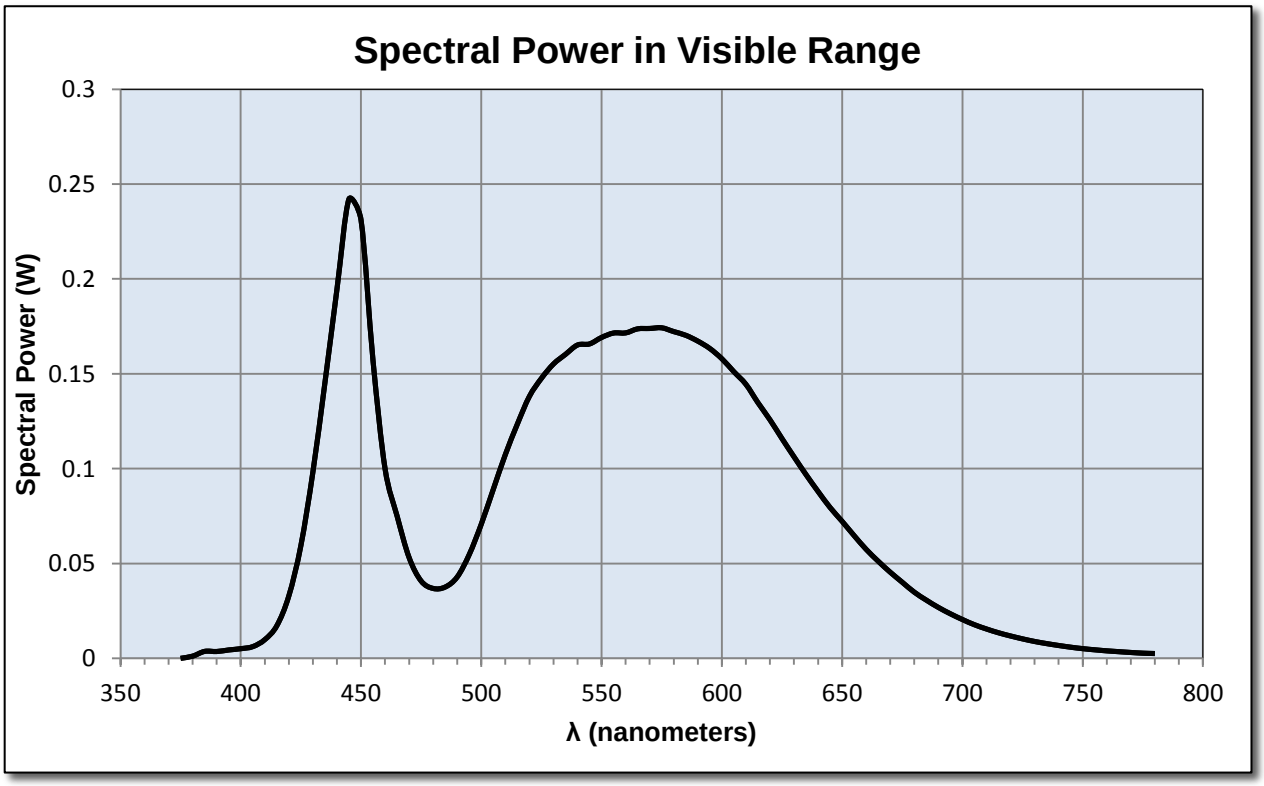
Ambient Temperature:	25 ± 1	(°C)

Electrical Measurements:

Input Voltage:	120	(VAC)
Input Current:	0.855	(A)
Input Power:	102.3	(W)
Input Power Factor:	0.995	
Current ATHD:	4.224	(%)

Photometric measurements:

Luminous Flux:	10680	(lumens)
Luminous Efficacy:	104.7	(lumens/W)
Correlated Color Temperature (CCT):	4913	(K)
CRI -Ra:	74	
CRI -R9:	-18.4	
DUV:	0.0034	
CIE Coordinate (x):	0.348	
CIE Coordinate (y):	0.361	
CIE Coordinate (u'):	0.21	
CIE Coordinate (v'):	0.327	



Test Results: Integrating Sphere

Results continued from previous page.

Tabulated Spectral Power in Visible Range:

λ(nm)	(W/nm)	λ(nm)	(W/nm)	λ(nm)	(W/nm)
375	0.000	515	0.123	655	0.065
380	0.001	520	0.138	660	0.057
385	0.004	525	0.148	665	0.051
390	0.004	530	0.155	670	0.045
395	0.004	535	0.160	675	0.040
400	0.005	540	0.165	680	0.035
405	0.006	545	0.166	685	0.031
410	0.010	550	0.169	690	0.027
415	0.017	555	0.171	695	0.023
420	0.033	560	0.172	700	0.020
425	0.059	565	0.174	705	0.018
430	0.098	570	0.174	710	0.015
435	0.145	575	0.174	715	0.013
440	0.195	580	0.172	720	0.012
445	0.242	585	0.170	725	0.010
450	0.231	590	0.167	730	0.009
455	0.157	595	0.163	735	0.008
460	0.100	600	0.158	740	0.007
465	0.075	605	0.151	745	0.006
470	0.053	610	0.144	750	0.005
475	0.041	615	0.135	755	0.004
480	0.037	620	0.126	760	0.004
485	0.038	625	0.116	765	0.004
490	0.043	630	0.106	770	0.003
495	0.055	635	0.097	775	0.003
500	0.071	640	0.088	780	0.003
505	0.089	645	0.080		
510	0.107	650	0.072		

Dialight OPTICS LABORATORY

NVLAP Lab Code 201033-0

Test Results: Goniometer

Results include unit flux, distribution, efficacy, and electrical power for sample number L16062.
Dialight unit model number FLx244xC2NP

Electrical Measurements:

Input Voltage:	120	(VAC)
Input current:	0.852	(A)
Input Power:	102.1	(W)
Power Factor:	0.995	

Photometric measurements:

Absolute Luminous Flux:	10743	(lumens)
Luminous Efficacy:	105.3	(lumens/W)

Intensity Summary:

INTENSITY (CANDLEPOWER) SUMMARY

ANGLE	ALONG	23	45	68	ACROSS	OUTPUT LUMENS
0	35369	35369	35369	35369	35369	
5	34199	34199	34199	34199	34199	1290
15	11879	11879	11879	11879	11879	4359
25	3593	3593	3593	3593	3593	1891
35	2823	2823	2823	2823	2823	1729
45	842	842	842	842	842	1321
55	45	45	45	45	45	90
65	25	25	25	25	25	30
75	16	16	16	16	16	21
85	3	3	3	3	3	10
95	0	0	0	0	0	0
105	0	0	0	0	0	0
115	0	0	0	0	0	0
125	0	0	0	0	0	0
135	0	0	0	0	0	0
145	0	0	0	0	0	0
155	0	0	0	0	0	0
165	0	0	0	0	0	0
175	0	0	0	0	0	0
180	0	0	0	0	0	

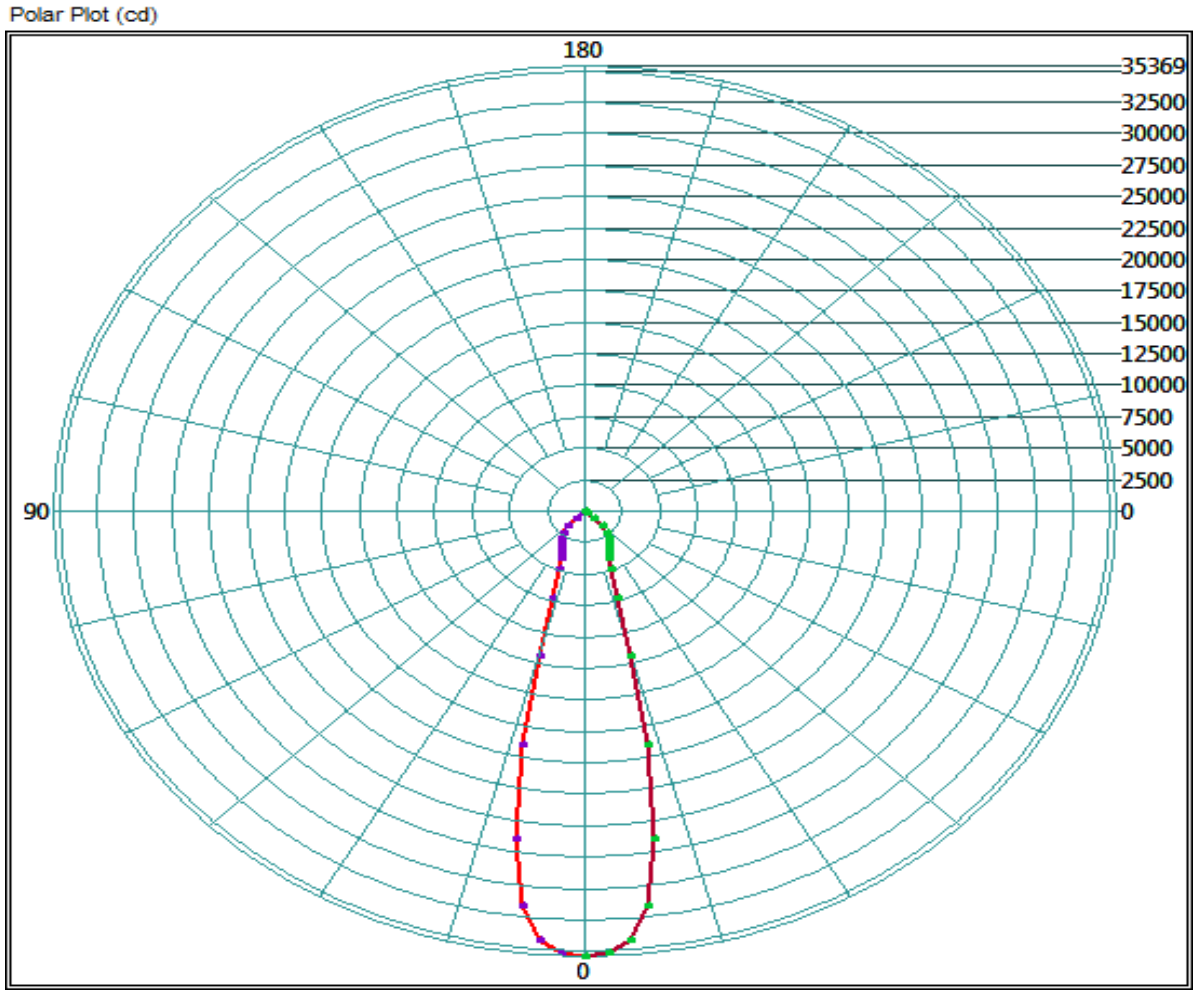
ZONAL LUMEN AND PERCENTAGES

ZONE	LUMENS	% LUMINAIRE
0-30	8388.32	78.1%
0-40	10126.88	94.3%
0-60	10698.4	99.6%
60-90	53.12	0.5%
0-90	10743.2	100.0%
90-180	0	0.0%
0-180	10743.2	100.0%

Test Results: Goniometer

Results continued from previous page.

Polar Plot:



Target % of Peak Intensity	Beam Angle to % Intensity Value (degrees)	Beam Angle to Specified % Intensity Value (degrees) [-]
50.00	25.92	25.92

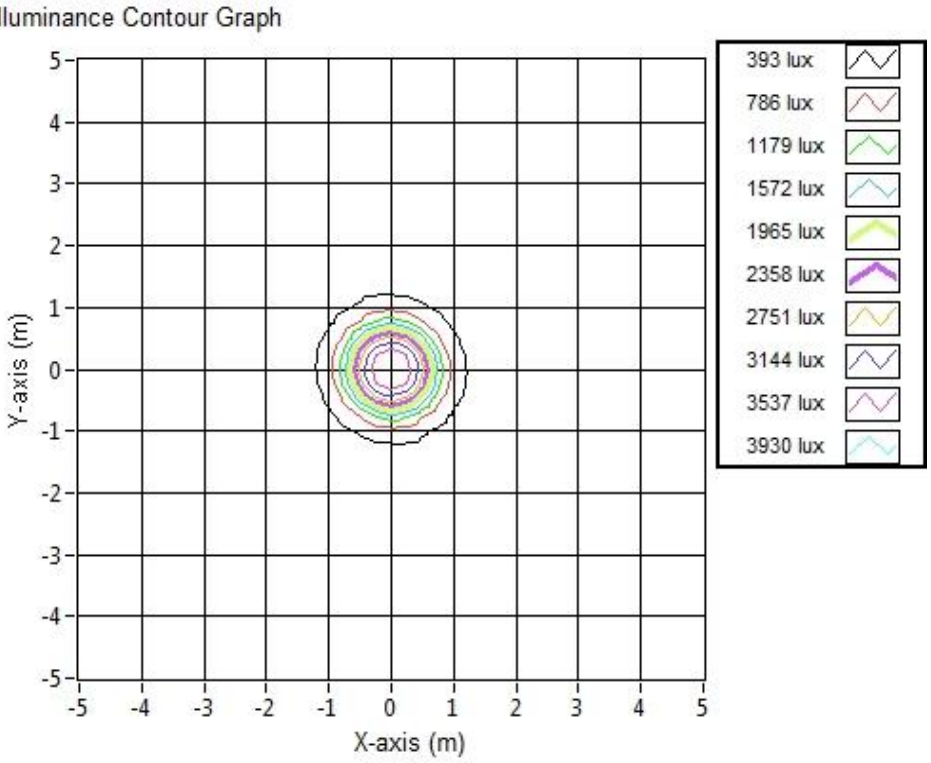
Beam Spread (at 50% Max CD)		Field Spread (at 10% Max CD)		IESNA LM-35-02 Floodlight Designation	
(deg) Horiz	(deg) Vert	(deg) Horiz	(deg) Vert	IESNA LM-35-02 Floodlight H Designation	IESNA LM-35-02 Floodlight V Designation
25.92	25.92	51.02	51.02	4	4

Total Luminous Flux	Field (%)	Field Flux (lm)	Beam Flux (%)	Beam Flux (lm)	Beam Spill (%)	Spill Flux (lm)
10740.87	68.16	7321.27	39.55	4247.79	31.84	3419.59

Test Results: Goniometer

Results continued from previous page.

Illuminance Plot:



Illuminance-Cone of Light:

Mounting Height (m)	Beam Cone Width (m)	Orthogonal Beam Cone Width (m)	Projected Illuminance (lux)
3.048	1.40	1.40	3807.1
6.096	2.81	2.81	951.8
9.144	4.21	4.21	423.0
12.192	5.61	5.61	237.9
15.24	7.02	7.02	152.3
18.288	8.42	8.42	105.8
21.336	9.82	9.82	77.7
24.384	11.22	11.22	59.5
27.432	12.63	12.63	47.0
30.48	14.03	14.03	38.1

Dialight OPTICS LABORATORY

NVLAP Lab Code 201033-0

Test Results: In Situ Temperature Measurement Test

Results include maximum LED chip temperature for sample number L16062.
Dialight unit model number FLx244xC2NP

LED identified as Nichia part number 219B.

LED drive current (as indicated by customer):	425	(mA)

LED Specifications:

LED specifications are taken from LED manufacturer datasheet:

Maximum Forward Current (If):	1500	(mA)
Maximum Rated Power Dissipation:	5.1	(W)
Maximum Junction Temp. (Tj):	150	(°C)
Thermal Resistance (Rth):	11	(°C/W)

Derived Specifications:

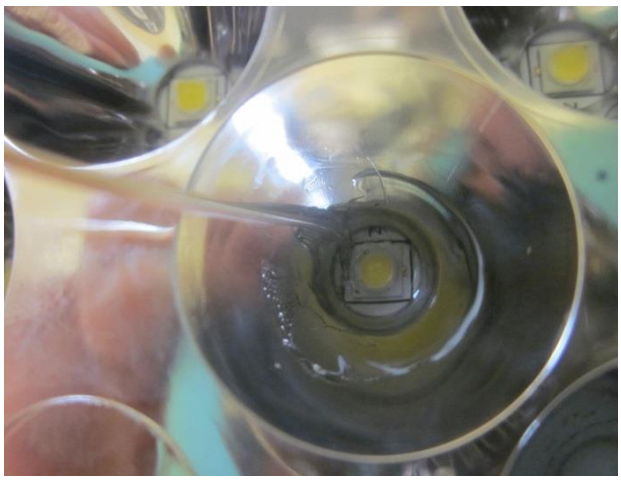
Maximum Power at Indicated Current:	1.445	(W)
Maximum Source Temperature:	134.1	(°C)

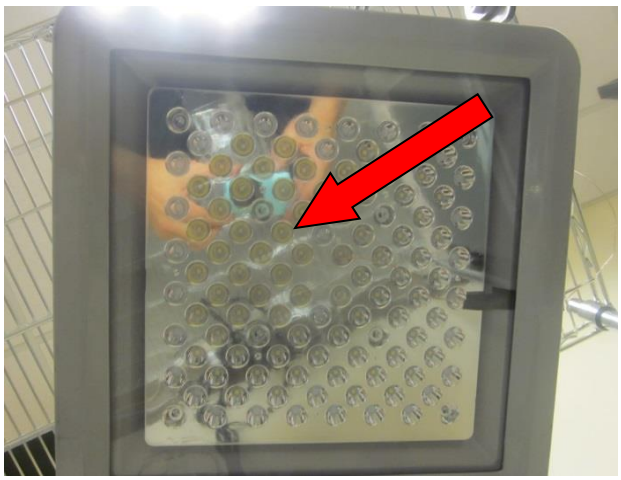
Test Conditions:

Temperature Measurement Location:	See Photographs Below	
Ambient Temperature:	25° ± 5‘	(°C)
Ambient temperature at time of measurement:	24.5	(°C)
Relative humidity at time of measurement:	41%	

Results:

Measured LED source temperature:	72.2	(°C)





Equipment Used:

Equipment Name	Model Number
Omega TC	Dpi8
Fluke 8808A Digit Multimeter	8808A
YOKOGAWA Digital Power Meter	11/26/3981
LSI High Speed Mirror Goniometer	6240T
Instrument System Spectrometer	CAS140B-151
Instrument System 1.5 Meter Sphere	ISP1500
Volttech Power Analyzer	PM1000+
Delta Elektronika DC Power Supply	SM.300-5
Elgar AC Power Supply	CW1251P
Instek AC Power Supply	APS-9501
Sorensen DC Power Supply	XHR150-7
Extech Hygro-Thermometer	4/16/3120
Extech Hygro-Thermometer	4/16/3120
Fluke 52II Thermometer	52II Thermometer
Volttech Power Analyzer	PM1000+
BK Precison	1715A
TDK-Lambda	GEN1500W
Fluke 8808A Digit Multimeter	8808A
TPI Digitial Thermometer 343	TPI 343
TPI Digitial Thermometer 343	TPI 343
Step-Up Transformer	
Omega TC	Dpi8-C24
Agilent True RMS OLED Multimeter	U1273A
Adaptive Power Systems AC Power Supply	FC-210
Xitron Power Analyzer	XT2640

Additional Notes:

Samples are received and tested in new and undamaged condition, unless otherwise noted.
The results shown in this report are representative only of the test samples submitted. This data has been issued to the assignee for further evaluation.
This report shall not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the Federal Government.

Test Report Issued By:

Richard Huegi
Dialight Optics Laboratory
Senior Optical Engineering Technician
Lighting Division

Test Report Reviewed and Approved By:

Yinan Zhang
Dialight Optics Laboratory
Optical Engineer