Dialight OPTICS LABORATORY

NVLAP Lab Code 201033-0

Test Report

Report Number: L16063 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: FLx222xC2NP

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 8, 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: L16063
Manufacturer: Dialight Corporation
Product Name: Die Cast Floodlight
Description: Die Cast Floodlight
Model Number: FLx222xC2NP

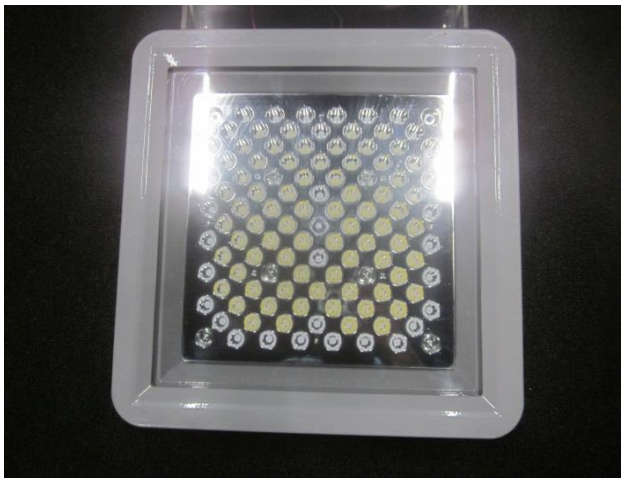
Dialight OPTICS LABORATORY

NVLAP Lab Code 201033-0

Report Summary

Sample number L16063
Dialight unit model number FLx222xC2NP

Photograph(s) of sample:



*Photographs not to scale. For reference only.

Summary of Results:

	Integrating Sphere		Goniophotometer	
Luminous Flux:	9888	(lumens)	10166	(lumens)
Electrical Power:	102.8	(W)	102.9	(W)
Luminous Efficacy:	96.8	(lumens/W)	98.79	(lumens/W)

Electrical Measurements:

Input Power (120VAC):	102.8	(W)
Power Factor (120VAC):	0.995	
Current ATHD % (120VAC):	4.17	
Input Power (277VAC):	100.1	(W)
Power Factor (277VAC):	0.916	
Current ATHD % (277VAC):	8.35	

Color Measurements:

Correlated Color Temperature (CCT):	4920
Color Rendering Index (CRI):	73.8
Chromaticity Coordinate (x):	0.348
Chromaticity Coordinate (y):	0.361
Chromaticity Coordinate (u'):	0.21
Chromaticity Coordinate (v'):	0.326
DUV:	0.0034

Temperature Measurements:

In Situ LED Source Temperature:	74.4	(°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 L16063.
Dialight unit model number FLx222xC2NP

Test Conditions:

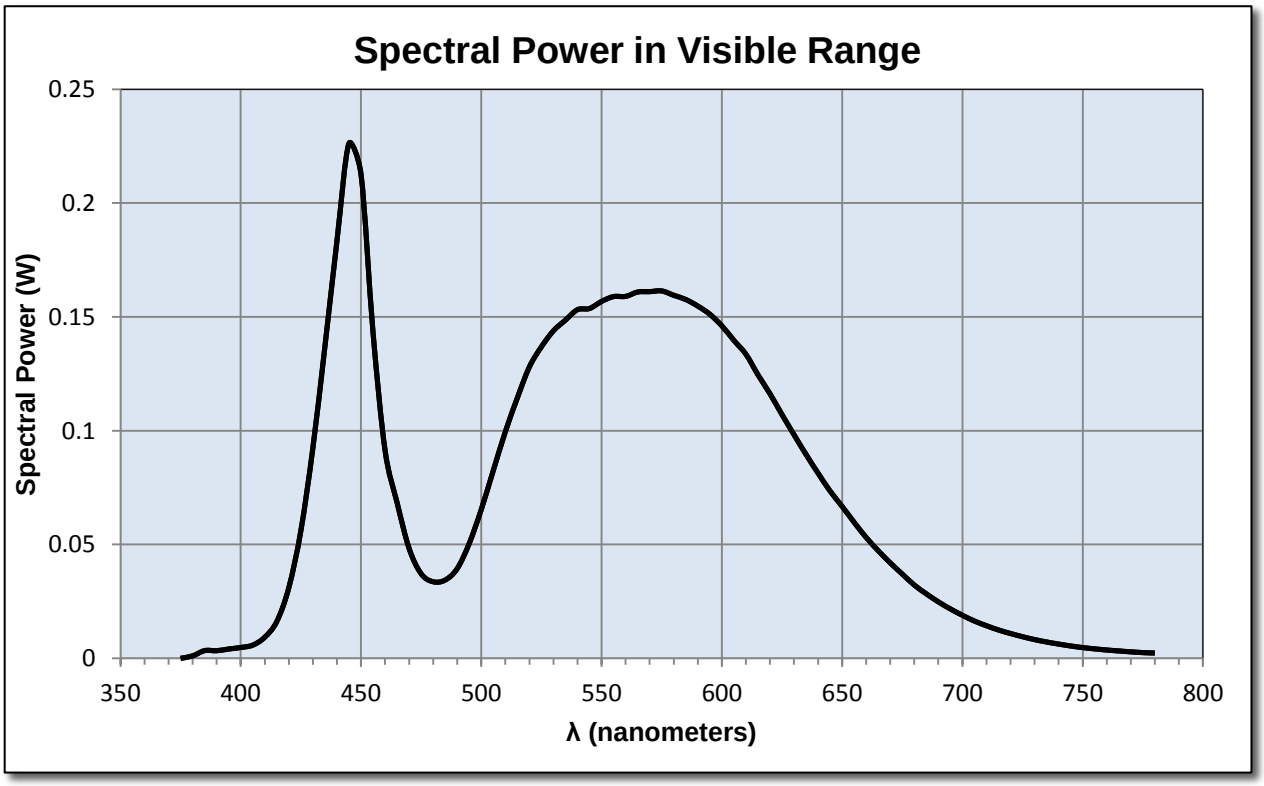
Ambient Temperature:	25 ± 1	(°C)

Electrical Measurements:

Input Voltage:	120	(VAC)
Input Current:	0.86	(A)
Input Power:	102.8	(W)
Input Power Factor:	0.995	
Current ATHD:	4.17	(%)

Photometric measurements:

Luminous Flux:	9888	(lumens)
Luminous Efficacy:	96.8	(lumens/W)
Correlated Color Temperature (CCT):	4920	(K)
CRI -Ra:	73.8	
CRI -R9:	-18.9	
DUV:	0.0034	
CIE Coordinate (x):	0.348	
CIE Coordinate (y):	0.361	
CIE Coordinate (u'):	0.21	
CIE Coordinate (v'):	0.326	



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	0.114	655	0.060
380	0.001	520	0.128	660	0.053
385	0.003	525	0.137	665	0.047
390	0.003	530	0.144	670	0.042
395	0.004	535	0.149	675	0.037
400	0.005	540	0.153	680	0.032
405	0.006	545	0.154	685	0.028
410	0.009	550	0.157	690	0.025
415	0.016	555	0.159	695	0.022
420	0.031	560	0.159	700	0.019
425	0.056	565	0.161	705	0.016
430	0.092	570	0.161	710	0.014
435	0.137	575	0.161	715	0.012
440	0.183	580	0.159	720	0.011
445	0.226	585	0.158	725	0.010
450	0.213	590	0.155	730	0.008
455	0.143	595	0.151	735	0.007
460	0.091	600	0.146	740	0.006
465	0.068	605	0.140	745	0.005
470	0.048	610	0.134	750	0.005
475	0.037	615	0.125	755	0.004
480	0.034	620	0.116	760	0.004
485	0.034	625	0.107	765	0.003
490	0.039	630	0.098	770	0.003
495	0.050	635	0.090	775	0.003
500	0.065	640	0.081	780	0.002
505	0.083	645	0.073		
510	0.100	650	0.067		

Dialight OPTICS LABORATORY

NVLAP Lab Code 201033-0

Test Results: Goniometer

Results include unit flux, distribution, efficacy, and electrical power for sample number L16063.
Dialight unit model number FLx222xC2NP

Electrical Measurements:

Input Voltage:	120	(VAC)
Input current:	0.86	(A)
Input Power:	102.9	(W)
Power Factor:	0.995	

Photometric measurements:

Absolute Luminous Flux:	10166	(lumens)
Luminous Efficacy:	98.8	(lumens/W)

Intensity Summary:

INTENSITY (CANDLEPOWER) SUMMARY

ANGLE	ALONG	23	45	68	ACROSS	OUTPUT LUMENS
0	111795	111795	111795	111795	111795	
5	73796	73796	73796	73796	73796	3122
15	6101	6101	6101	6101	6101	3275
25	3291	3291	3291	3291	3291	1504
35	2661	2661	2661	2661	2661	1660
45	127	127	127	127	127	477
55	91	91	91	91	91	78
65	13	13	13	13	13	36
75	7	7	7	7	7	9
85	2	2	2	2	2	4
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	

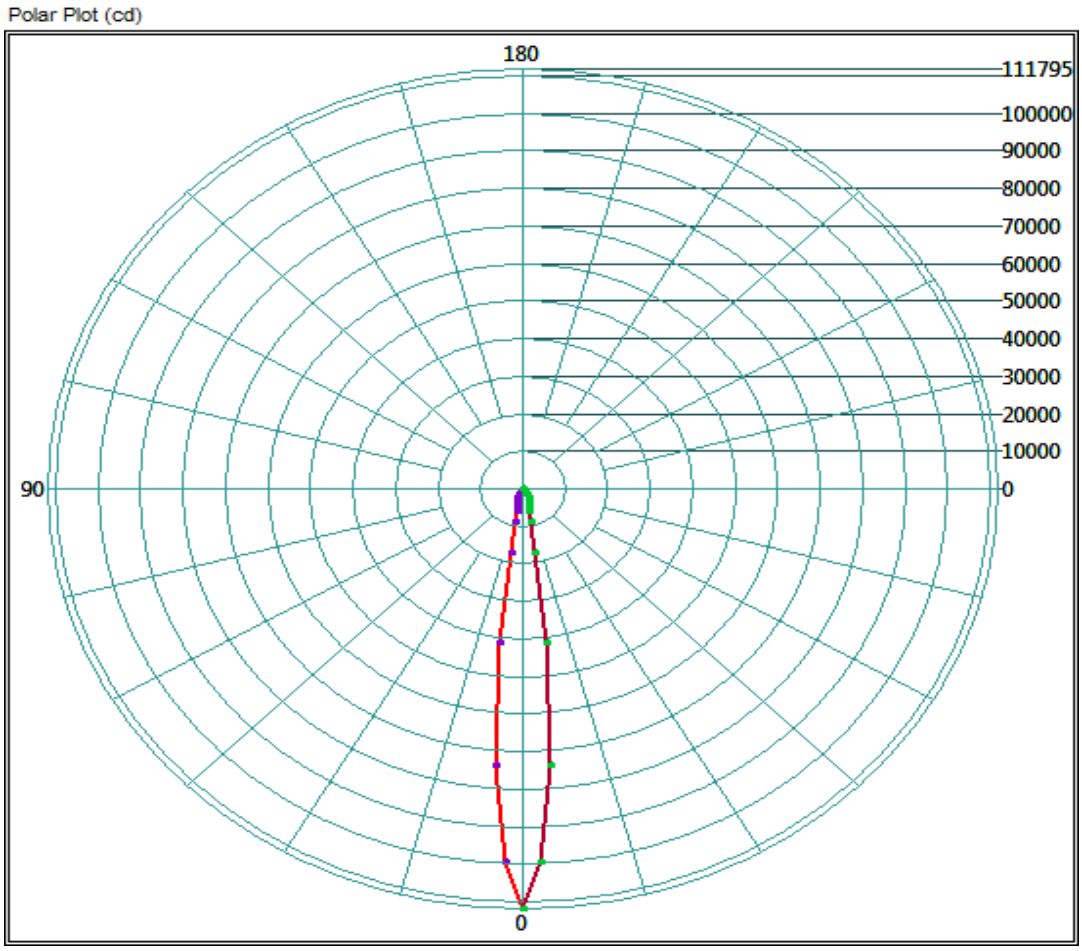
ZONAL LUMEN AND PERCENTAGES

ZONE	LUMENS	% LUMINAIRE
0-30	8712.16	85.7%
0-40	9981.92	98.2%
0-60	10145.76	99.8%
60-90	29.44	0.3%
0-90	10166.08	100.0%
90-180	0	0.0%
0-180	10166.08	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	12.77	12.77

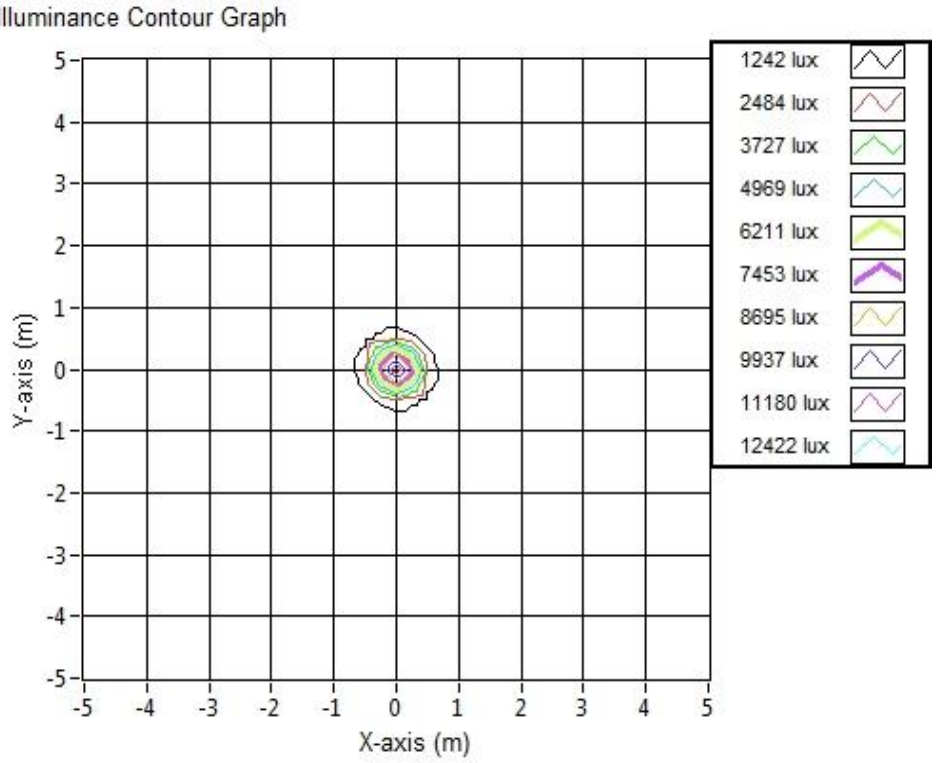
Beam Spread (at 50% Max CD)		Field Spread (at 10% Max CD)		IESNA LM-35-02 Floodlight Designation	
(deg) Horiz	(deg) Vert	(deg) Horiz	(deg) Vert	IESNA LM-35-02 Floodlight H Designation	IESNA LM-35-02 Floodlight V Designation
12.77	12.77	24.05	24.05	2	2

Total Luminous Flux	Field (%)	Field Flux (lm)	Beam Flux (%)	Beam Flux (lm)	Beam Spill (%)	Spill Flux (lm)
10208.26	54.84	5597.93	30.67	3130.93	45.16	4610.33

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	0.68	0.68	12033.5
6.096	1.36	1.36	3008.4
9.144	2.05	2.05	1337.1
12.192	2.73	2.73	752.1
15.24	3.41	3.41	481.3
18.288	4.09	4.09	334.3
21.336	4.77	4.77	245.6
24.384	5.46	5.46	188.0
27.432	6.14	6.14	148.6
30.48	6.82	6.82	120.3

Test Results: In Situ Temperature Measurement Test

Results include maximum LED chip temperature for sample number L16063.
Dialight unit model number FLx222xC2NP

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:

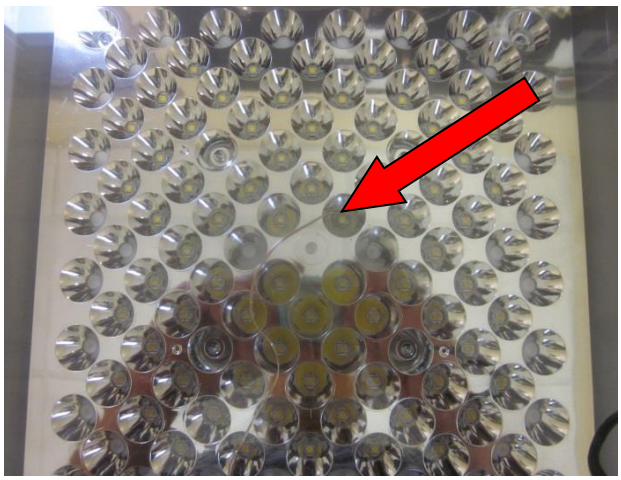
Maximum Power at Indicated Current:	1.445	(W)
Maximum Source Temperature:	134.1	(°C)

Test Conditions:

Temperature Measurement Location:	See Photographs Below	
Ambient Temperature:	25° ± 5‘	(°C)
Ambient temperature at time of measurement:	23.9	(°C)
Relative humidity at time of measurement:	35%	

Results:

Measured LED source temperature:	74.4	(°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:

Vishnu Shastry
Dialight Optics Laboratory
Optical Engineer
Approved Signatory