Dialight
OPTICS LABORATORY

NVLAP
NVLAP Lab Code 201033-0

Test Report

Report Number: L15163 Date: Jan 13, 2016

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

Test of one LED Floodlight
Unit manufacturer: Dialight Corporation
Unit model number: FLx276xC2NG

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: December 21, 2015 through January 13, 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: L15163
Manufacturer: Dialight Corporation
Product Name: LED Floodlight
Description: LED Floodlight
Model Number: FLx276xC2NG

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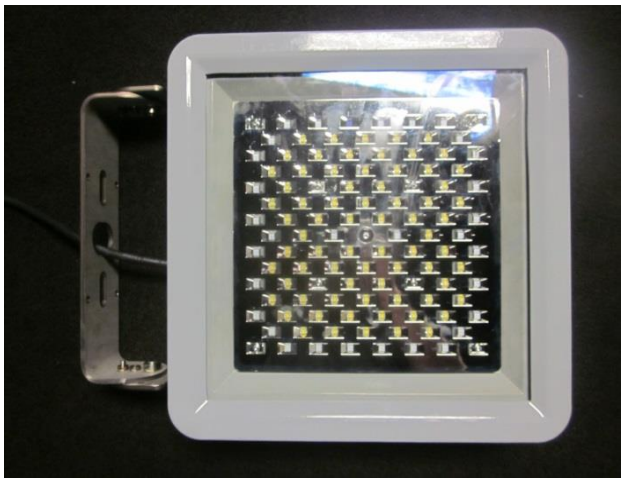
Report Summary

Sample number L15163
Dialight unit model number FLx276xC2NG

Photograph(s) of sample:



*Photographs not to scale. For reference only.

Summary of Results:

	Integrating Sphere	Goniophotometer
Luminous Flux:	11050 (lumens)	11066 (lumens)
Electrical Power:	106.7 (W)	106.9 (W)
Luminous Efficacy:	103.7 (lumens/W)	103.6 (lumens/W)

Electrical Measurements:

Input Power (120VAC):	106.7	(W)
Power Factor (120VAC):	0.995	
Current ATHD % (120VAC):	4.197	
Input Power (277VAC):	103.8	(W)
Power Factor (277VAC):	0.922	
Current ATHD % (277VAC):	8.63	

Color Measurements:

Correlated Color Temperature (CCT):	4779
Color Rendering Index (CRI):	71.7
Chromaticity Coordinate (x):	0.353
Chromaticity Coordinate (y):	0.368
Chromaticity Coordinate (u'):	0.21
Chromaticity Coordinate (v'):	0.329
DUV:	0.0051

Temperature Measurements:

In Situ LED Source Temperature:	70.0	(°C)

Test Results: Integrating Sphere

Results include unit color, flux, efficacy and electrical power for sample number L15163.
Dialight unit model number FLx276xC2NG

Test Conditions:

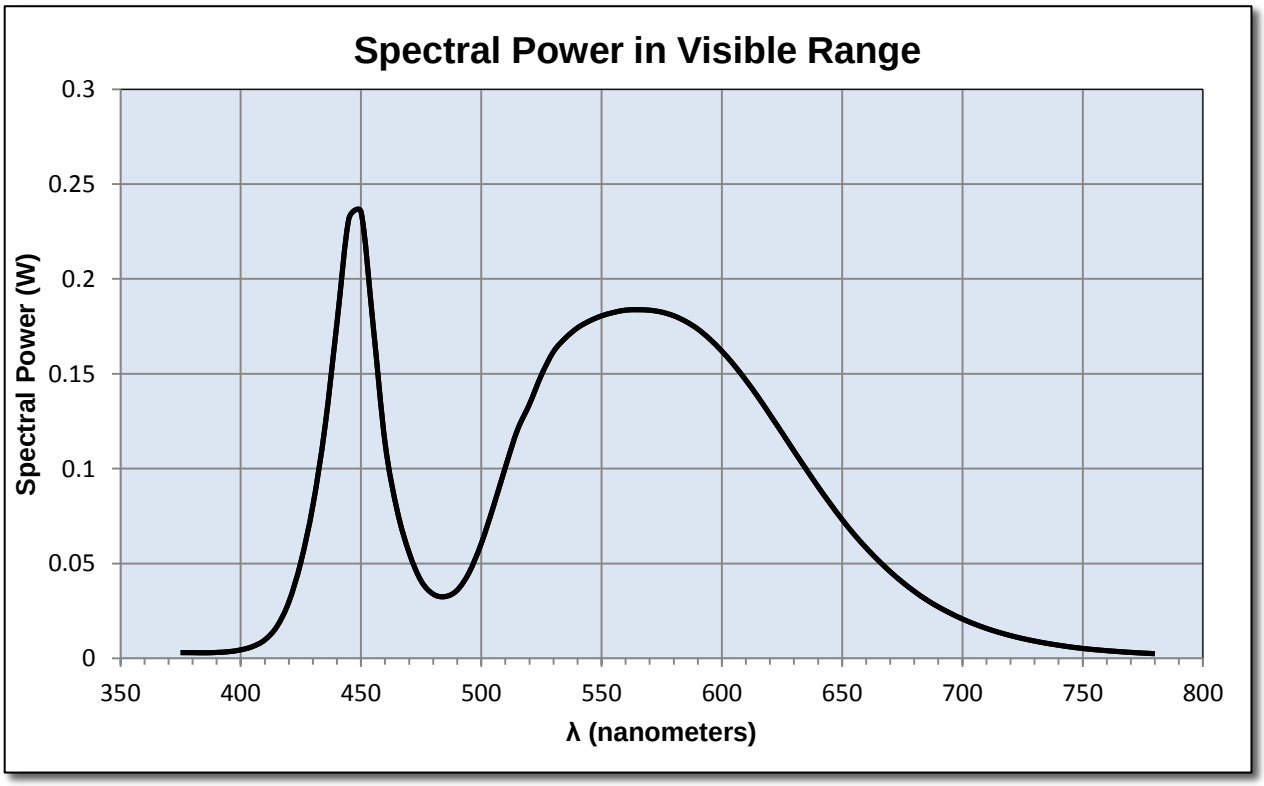
Ambient Temperature:	25 ± 1	(°C)

Electrical Measurements:

Input Voltage:	120	(VAC)
Input Current:	0.891	(A)
Input Power:	106.7	(W)
Input Power Factor:	0.995	
Current ATHD:	4.197	(%)

Photometric measurements:

Luminous Flux:	11050	(lumens)
Luminous Efficacy:	103.7	(lumens/W)
Correlated Color Temperature (CCT):	4779	(K)
CRI -Ra:	71.7	
CRI -R9:	-25.6	
DUV:	0.0051	
CIE Coordinate (x):	0.353	
CIE Coordinate (y):	0.368	
CIE Coordinate (u'):	0.21	
CIE Coordinate (v'):	0.329	



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	0.003	515	0.12	655	0.065
380	0.003	520	0.134	660	0.058
385	0.003	525	0.149	665	0.052
390	0.003	530	0.162	670	0.046
395	0.004	535	0.169	675	0.04
400	0.004	540	0.174	680	0.035
405	0.006	545	0.178	685	0.031
410	0.01	550	0.181	690	0.027
415	0.017	555	0.182	695	0.024
420	0.03	560	0.184	700	0.021
425	0.051	565	0.184	705	0.018
430	0.081	570	0.184	710	0.016
435	0.122	575	0.182	715	0.014
440	0.177	580	0.181	720	0.012
445	0.232	585	0.178	725	0.01
450	0.235	590	0.174	730	0.009
455	0.176	595	0.168	735	0.008
460	0.114	600	0.162	740	0.007
465	0.078	605	0.155	745	0.006
470	0.056	610	0.147	750	0.005
475	0.041	615	0.138	755	0.005
480	0.034	620	0.128	760	0.004
485	0.033	625	0.119	765	0.004
490	0.036	630	0.109	770	0.003
495	0.045	635	0.1	775	0.003
500	0.061	640	0.09	780	0.002
505	0.08	645	0.082		
510	0.101	650	0.073		

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Test Results: Goniometer

Results include unit flux, distribution, efficacy, and electrical power for sample number L15163.
Dialight unit model number FLx276xC2NG

Electrical Measurements:

Input Voltage:	120	(VAC)
Input current:	0.894	(A)
Input Power:	106.9	(W)
Power Factor:	0.995	

Photometric measurements:

Absolute Luminous Flux:	11066	(lumens)
Luminous Efficacy:	103.6	(lumens/W)

Intensity Summary:

INTENSITY (CANDLEPOWER) SUMMARY

ANGLE	ALONG	30	45	60	ACROSS	OUTPUT LUMENS
0	6243	6243	6243	6243	6243	
5	6216	6184	6170	6201	6244	231
15	5052	5178	5463	5881	6205	1216
25	3889	4053	4460	5178	6083	1949
35	3245	3451	3724	4132	5492	2393
45	2279	2627	2881	3423	5134	2508
55	339	922	1700	2386	2603	1920
65	20	68	145	992	864	778
75	9	13	5	14	8	67
85	1	1	1	1	1	3
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	

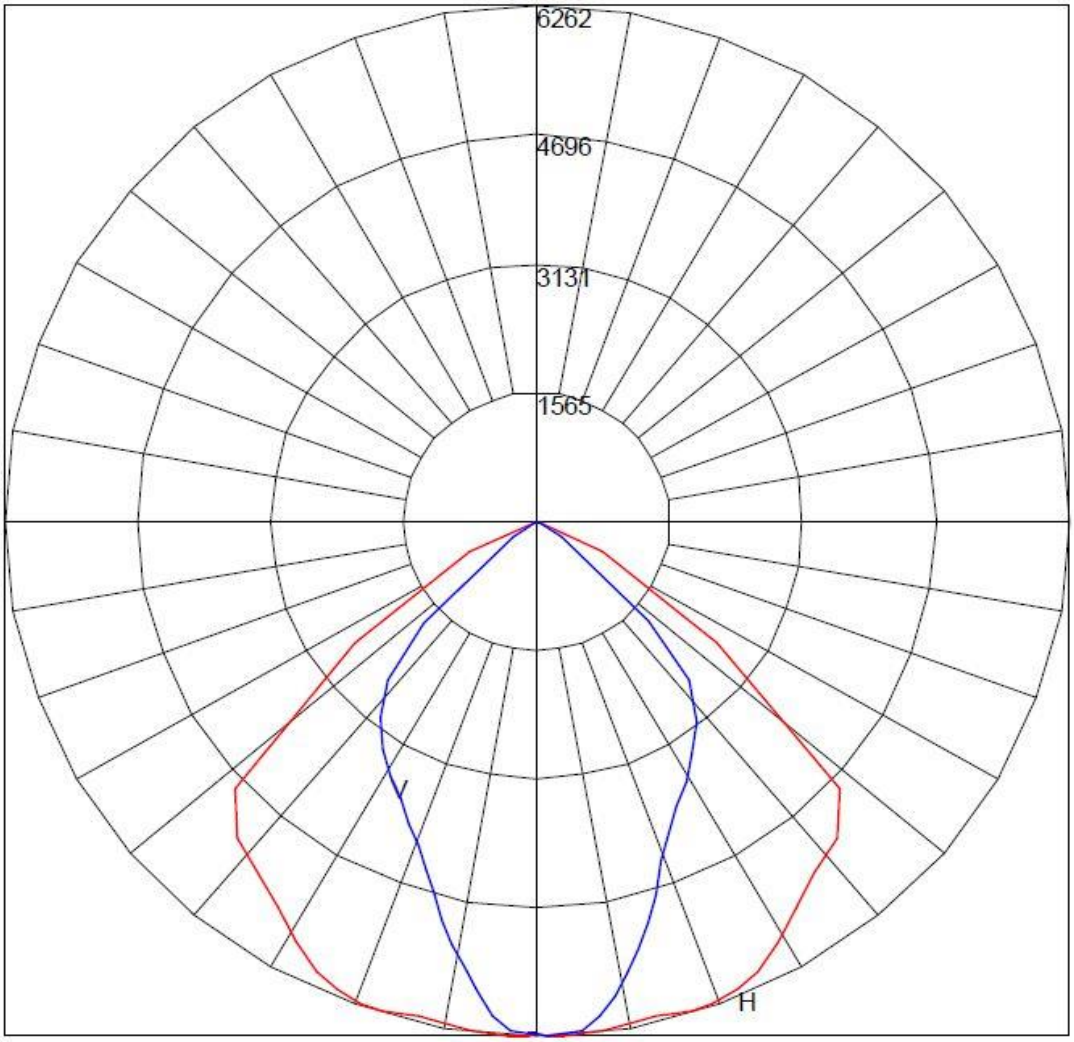
ZONAL LUMEN AND PERCENTAGES

ZONE	LUMENS	% LUMINAIRE
0-30	4557.3	41.2%
0-40	7050.95	63.7%
0-60	10709.43	96.8%
60-90	574.73	5.2%
0-90	11065.53	100.0%
90-180	0	0.0%
0-180	11065.53	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	72.76	106.17

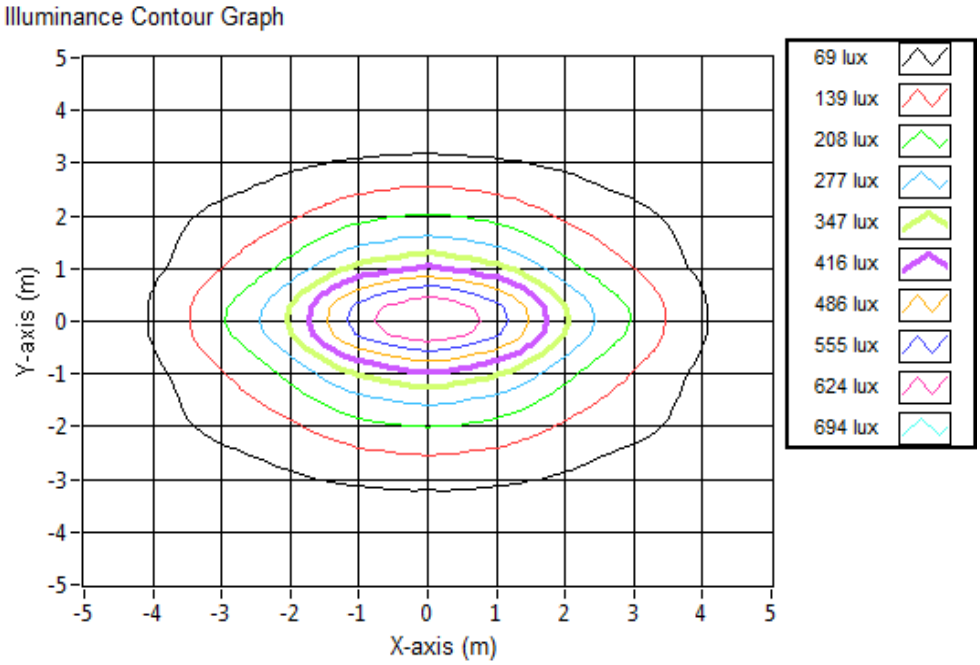
Beam Spread (at 50% Max CD)		Field Spread (at 10% Max CD)		IESNA LM-35-02 Floodlight Designation	
(deg) Horiz	(deg) Vert	(deg) Horiz	(deg) Vert	IESNA LM-35-02 Floodlight H Designation	IESNA LM-35-02 Floodlight V Designation
106.46	71.81	135.55	107.06	7	6

Total Luminous Flux	Field (%)	Field Flux (lm)	Beam Flux (%)	Beam Flux (lm)	Beam Spill (%)	Spill Flux (lm)
10969.02	97.63	10709.46	71.86	7882.10	2.37	259.55

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	4.49	8.11	672.0
6.096	8.98	16.23	168.0
9.144	13.47	24.34	74.7
12.192	17.97	32.46	42.0
15.24	22.46	40.57	26.9
18.288	26.95	48.69	18.7
21.336	31.44	56.80	13.7
24.384	35.93	64.91	10.5
27.432	40.42	73.03	8.3
30.48	44.91	81.14	6.7

Test Results: In Situ Temperature Measurement Test

Results include maximum LED chip temperature for sample number L15163.
Dialight unit model number FLx276xC2NG

LED identified as Cree part number XTEAWT.

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:	5.25	(W)
Maximum Junction Temp. (Tj):	150	(°C)
Thermal Resistance (Rth):	5	(°C/W)

Derived Specifications:

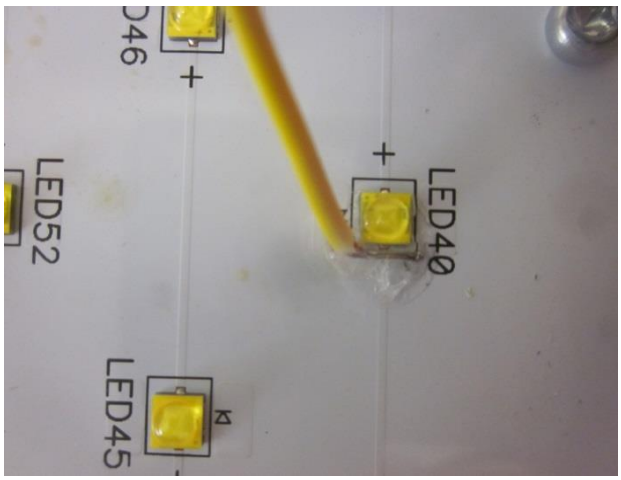
Maximum Power at Indicated Current:	1.488	(W)
Maximum Source Temperature:	142.6	(°C)

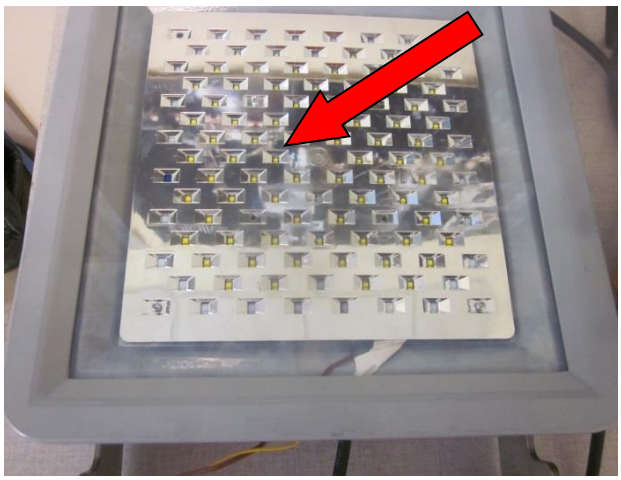
Test Conditions:

Temperature Measurement Location:	See Photographs Below	
Ambient Temperature:	25° ± 1‘	(°C)
Ambient temperature at time of measurement:	24.1	(°C)
Relative humidity at time of measurement:	11%	

Results:

Measured LED source temperature: 70 (°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