

# Test Report

Report Number: L15006

Date: Feb 2, 2015

Issued by:

Dialight Optics Laboratory  
1501 Route 34 South, Farmingdale, NJ 07727

Test of one LED Floodlight Fixture  
Unit manufacturer: Dialight Corporation  
Unit model number: FLX422NC4NG

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:** January 26, 2015 through February 2, 2015

**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: L15006  
Manufacturer: Dialight Corporation  
Product Name: LED Floodlight  
Description: LED Floodlight  
Model Number: FLx422NC4NG

## Report Summary

Sample number L15006  
Dialight unit model number FLx422NC4NG

### Photograph(s) of sample:



\*Photographs not to scale. For reference only.

### Summary of Results:

	<u>Integrating Sphere</u>	<u>Goniophotometer</u>
Luminous Flux:	13650 (lumens)	13851 (lumens)
Electrical Power:	137.2 (W)	136.8 (W)
Luminous Efficacy:	99.49 (lumens/W)	101.2 (lumens/W)

### Electrical Measurements:

Input Power (120VAC): 137.2 (W)  
Power Factor (120VAC): 0.998  
Current ATHD % (120VAC): 2.864  
Input Power (277VAC): 132.5 (W)  
Power Factor (277VAC): 0.942  
Current ATHD % (277VAC): 6.77

### Color Measurements:

Correlated Color Temperature (CCT): 4836  
Color Rendering Index (CRI): 72.6  
Chromaticity Coordinate (x): 0.351  
Chromaticity Coordinate (y): 0.363  
Chromaticity Coordinate (u'): 0.211  
Chromaticity Coordinate (v'): 0.327  
DUV: 0.0032

### Temperature Measurements:

In Situ LED Source Temperature: 65.8 (°C)

## Test Results: Integrating Sphere

Results include unit color, flux, efficacy and electrical power for sample number L15006.  
Dialight unit model number FLx422NC4NG

### Test Conditions:

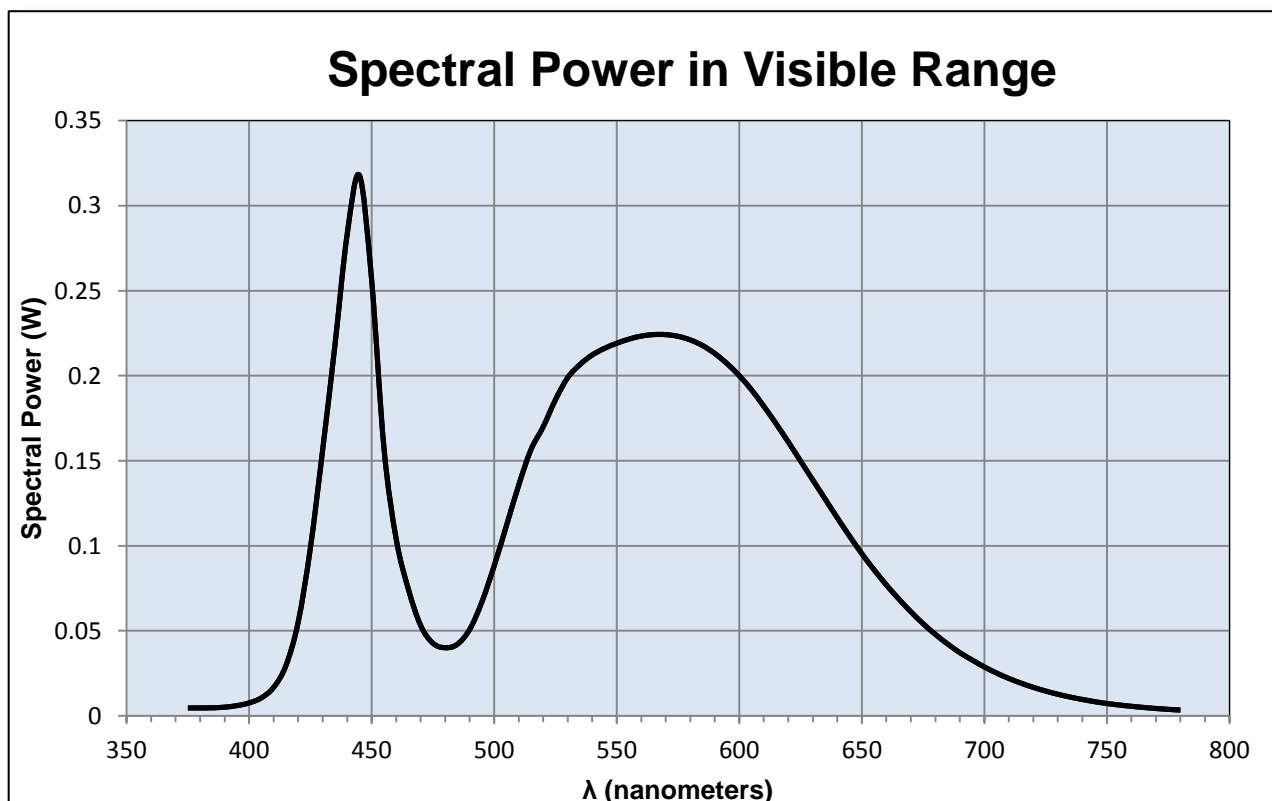
Ambient Temperature:  $25 \pm 1$  (°C)

### Electrical Measurements:

Input Voltage: 120 (VAC)  
Input Current: 1.147 (A)  
Input Power: 137.2 (W)  
Input Power Factor: 0.998  
Current ATHD: 2.864 (%)

### Photometric measurements:

Luminous Flux: 13650 (lumens)  
Luminous Efficacy: 99.5 (lumens/W)  
Correlated Color Temperature (CCT): 4836 (K)  
CRI -Ra: 72.6  
CRI -R9: -18.8  
DUV: 0.0032  
CIE Coordinate (x): 0.351  
CIE Coordinate (y): 0.363  
CIE Coordinate (u'): 0.211  
CIE Coordinate (v'): 0.327



## Test Results: Integrating Sphere

Results continued from previous page.

### Tabulated Spectral Power in Visible Range:

$\lambda$ (nm)	(W/nm)	$\lambda$ (nm)	(W/nm)	$\lambda$ (nm)	(W/nm)
375	0.005	515	0.157	655	0.086
380	0.005	520	0.17	660	0.077
385	0.005	525	0.186	665	0.069
390	0.005	530	0.199	670	0.061
395	0.006	535	0.207	675	0.054
400	0.008	540	0.212	680	0.048
405	0.011	545	0.216	685	0.042
410	0.017	550	0.219	690	0.037
415	0.029	555	0.222	695	0.033
420	0.055	560	0.223	700	0.029
425	0.099	565	0.224	705	0.025
430	0.156	570	0.224	710	0.022
435	0.218	575	0.223	715	0.019
440	0.283	580	0.221	720	0.017
445	0.318	585	0.218	725	0.015
450	0.256	590	0.213	730	0.013
455	0.158	595	0.207	735	0.011
460	0.104	600	0.2	740	0.01
465	0.074	605	0.192	745	0.008
470	0.053	610	0.182	750	0.007
475	0.043	615	0.172	755	0.006
480	0.04	620	0.161	760	0.006
485	0.042	625	0.15	765	0.005
490	0.051	630	0.139	770	0.004
495	0.067	635	0.128	775	0.004
500	0.088	640	0.116	780	0.003
505	0.112	645	0.106		
510	0.136	650	0.095		

## Test Results: Goniometer

Results include unit flux, distribution, efficacy, and electrical power for sample number L15006.  
Dialight unit model number FLx422NC4NG

### Electrical Measurements:

Input Voltage: 120 (VAC)  
Input current: 1.142 (A)  
Input Power: 136.8 (W)  
Power Factor: 0.997

### Photometric measurements:

Absolute Luminous Flux: 13851 (lumens)  
Luminous Efficacy: 101.2 (lumens/W)

### Intensity Summary:

ANGLE	ALONG	<u>INTENSITY (CANDLEPOWER) SUMMARY</u>				OUTPUT LUMENS
		22.5	45	67.5	ACROSS	
0	158455	158455	158455	158455	158455	
5	102194	102272	102529	102568	102658	4367
15	8475	8416	8386	8486	8552	0
25	4448	4442	4458	4443	4468	0
35	3566	3575	3609	3613	3614	0
45	50	52	51	50	48	0
55	8	7	7	6	9	0
65	0	0	0	0	0	0
75	0	0	0	0	0	0
85	0	0	0	0	0	0
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	1	2	1	0	1	0
165	17	17	18	18	19	0
175	4	5	5	5	7	0
180	0	0	0	0	0	0

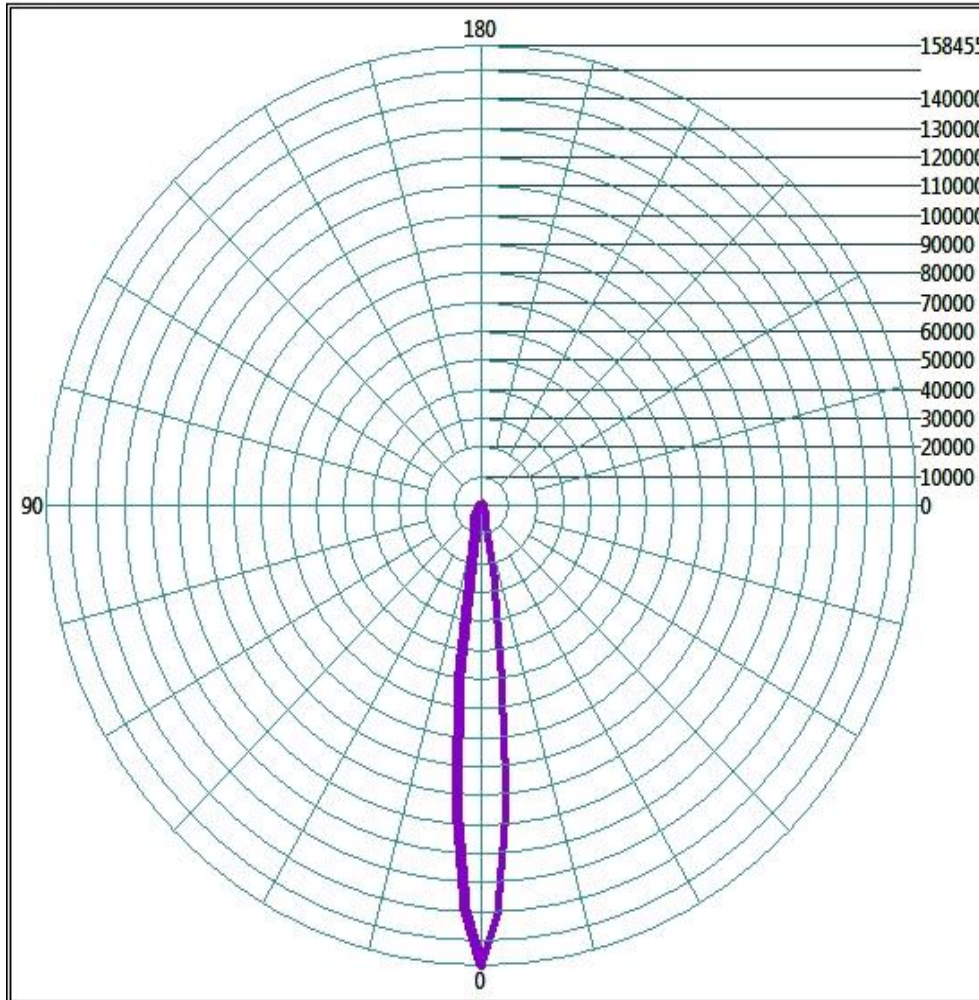
### ZONAL LUMEN AND PERCENTAGES

ZONE	LUMENS	% LUMINAIRE
0-30	12087.68	87.3%
0-40	13803.3	99.7%
0-60	13843.64	100.0%
60-90	0	0.0%
0-90	13843.64	100.0%
90-180	6.9	0.0%
0-180	13850.54	100.0%

## Test Results: Goniometer

Results continued from previous page.

Polar Plot: Polar Plot (cd)



Target % of Peak Intensity	Beam Angle to % Intensity Value (degrees)	Beam Angle to Specified % Intensity Value (degrees) [-]
50.00	12.60	12.59

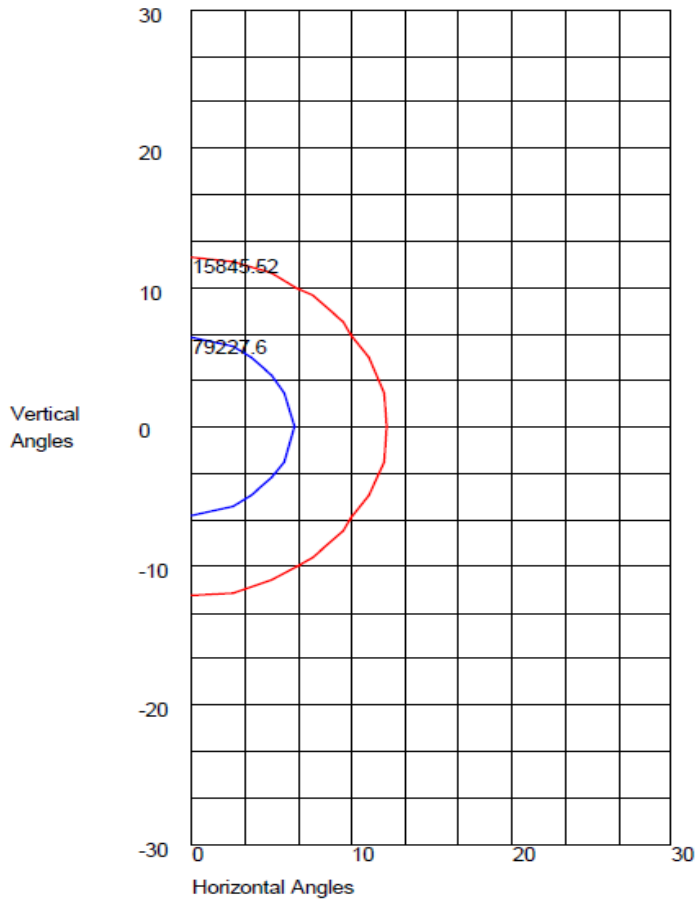
Beam Spread (at 50% Max CD)		Field Spread (at 10% Max CD)		IESNA LM-35-02 Floodlight Designation	
(deg) Horiz	(deg) Vert	(deg) Horiz	(deg) Vert	IESNA LM-35-02 Floodlight H Designation	IESNA LM-35-02 Floodlight V Designation
12.59	12.60	24.04	23.85	2	2

Total Luminous Flux	Field (%)	Field Flux (lm)	Beam Flux (%)	Beam Flux (lm)	Beam Spill (%)	Spill Flux (lm)
13900.22	56.38	7836.54	31.53	4382.10	43.62	6063.68

## Test Results: Goniometer

Results continued from previous page.

### Illuminance Plot: ISOCANDELA CURVES



Maximum Candela = 158455.203 Located At Horizontal Angle = 0, Vertical Angle = 0  
 50% Maximum Candela = 79227.6015  
 10% Maximum Candela = 15845.5203

### Illuminance-Cone of Light:

Mounting Height (m)	Beam Cone Width (m)	Orthogonal Beam Cone Width (m)	Projected Illuminance (lux)
3.048	0.67	0.67	17056.0
6.096	1.35	1.34	4264.0
9.144	2.02	2.02	1895.1
12.192	2.69	2.69	1066.0
15.24	3.36	3.36	682.2
18.288	4.04	4.03	473.8
21.336	4.71	4.71	348.1
24.384	5.38	5.38	266.5
27.432	6.06	6.05	210.6
30.48	6.73	6.72	170.6

## Test Results: In Situ Temperature Measurement Test

Results include maximum LED chip temperature for sample number L15006.  
Dialight unit model number FLx422NC4NG

LED identified as Nichia part number Nichia 219B.

LED drive current (as indicated by customer): 400 (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:

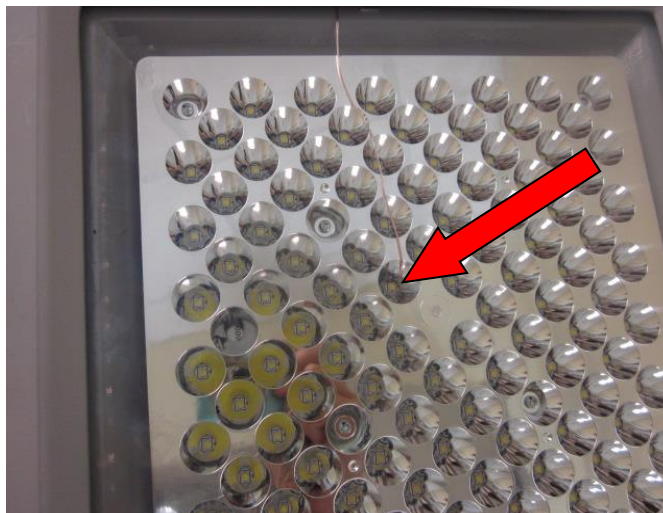
Maximum Power at Indicated Current: 1.36 (W)  
Maximum Source Temperature: 135 (°C)

### Test Conditions:

Temperature Measurement Location: See Photographs Below  
Ambient Temperature:  $25^{\circ} \pm 1^{\circ}$  (°C)  
Ambient temperature at time of measurement: 25.5 (°C)  
Relative humidity at time of measurement: 10%

### Results:

Measured LED source temperature: 65.8 (°C)





**Equipment Used:**

Equipment Name	Model Number	Calibration Due Date
Omega TC	Dpi8	3/7/2015
Fluke 8808A Digit Multimeter	8808A	4/7/2015
YOKOGAWA Digital Power Meter	760401	4/7/2015
LSI Standard Lamps	#30279	4/17/2015
LSI High Speed Mirror Goniometer	6240T	-
Instrument System Spectrometer	CAS140B-151	-
Instrument System Sphere Lamps (Osram Sylvania)	STD-20WF-3	4/17/2015
Instrument System Sphere Lamps (Osram Sylvania)	STD-20WF-3	4/17/2015
Instrument System Sphere Lamps (Osram Sylvania)	STD-20WF-3	4/17/2015
Instrument System 1.5 Meter Sphere	ISP1500	-
Volttech Power Analyzer	PM1000+	4/17/2015
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	445703	-
Extech Hygro-Thermometer	445703	-
Fluke 52II Thermometer	52II Thermometer	3/6/2015
Volttech Power Analyzer	PM1000+	4/17/2015
Tenma AC Power Source	72-7675	-
BK Precision	1715A	-
TDK-Lambda	GEN1500W	-
Fluke 8808A Digit Multimeter	8808A	4/14/2015
TPI Digital Thermometer 343	343	4/17/2015
TPI Digital Thermometer 343	343	4/17/2015

**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.

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