

Test Report

Report Number: L16043

Date: May 11, 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: FLx467xC4NP

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: April 29, 2016 through May 5, 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: L16043
Manufacturer: Dialight Corporation
Product Name: Die Cast Floodlight
Description: Die Cast Floodlight
Model Number: FLx467xC4NP

Report Summary
Sample number L16043
Dialight unit model number FLx467xC4NP

Photograph(s) of sample:



*Photographs not to scale. For reference only.

Summary of Results:

	<u>Integrating Sphere</u>	<u>Goniophotometer</u>
Luminous Flux:	14060 (lumens)	14128 (lumens)
Electrical Power:	140.4 (W)	140.6 (W)
Luminous Efficacy:	100.2 (lumens/W)	100.5 (lumens/W)

Electrical Measurements:

Input Power (120VAC): 140.4 (W)
 Power Factor (120VAC): 0.997
 Current ATHD % (120VAC): 3.23
 Input Power (277VAC): 135.5 (W)
 Power Factor (277VAC): 0.949
 Current ATHD % (277VAC): 7.67

Color Measurements:

Correlated Color Temperature (CCT): 5033
 Color Rendering Index (CRI): 72.7
 Chromaticity Coordinate (x): 0.345
 Chromaticity Coordinate (y): 0.355
 Chromaticity Coordinate (u'): 0.21
 Chromaticity Coordinate (v'): 0.324
 DUV: 0.0017

Temperature Measurements:

In Situ LED Source Temperature: 71.9 (°C)

Test Results: Integrating Sphere

Results include unit color, flux, efficacy and electrical power for sample number L16043.

Dialight unit model number FLx467xC4NP

Test Conditions:

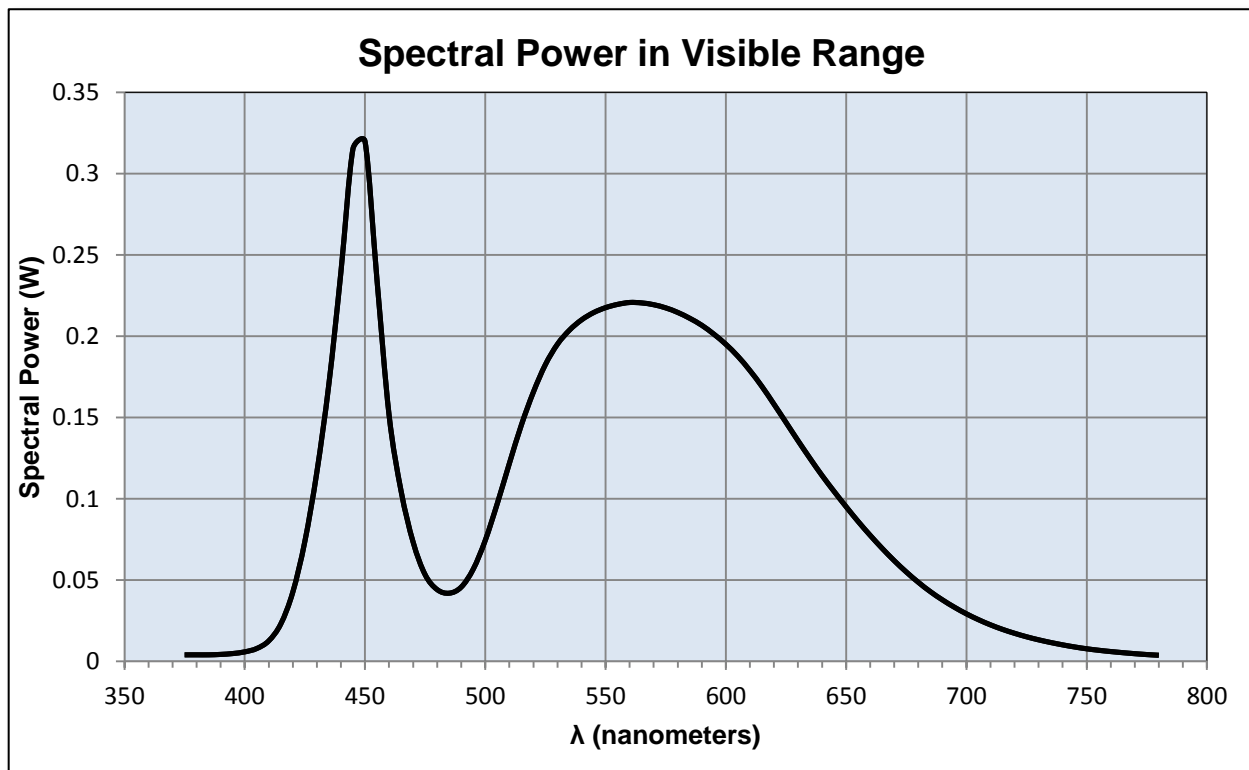
Ambient Temperature: 25 ± 1 (°C)

Electrical Measurements:

Input Voltage: 120 (VAC)
Input Current: 1.173 (A)
Input Power: 140.4 (W)
Input Power Factor: 0.997
Current ATHD: 3.23 (%)

Photometric measurements:

Luminous Flux: 14060 (lumens)
Luminous Efficacy: 100.2 (lumens/W)
Correlated Color Temperature (CCT): 5033 (K)
CRI -Ra: 72.7
CRI -R9: -16.9
DUV: 0.0017
CIE Coordinate (x): 0.345
CIE Coordinate (y): 0.355
CIE Coordinate (u'): 0.21
CIE Coordinate (v'): 0.324



Test Results: Integrating Sphere

Results continued from previous page.

Tabulated Spectral Power in Visible Range:

$\lambda(\text{nm})$	(W/nm)	$\lambda(\text{nm})$	(W/nm)	$\lambda(\text{nm})$	(W/nm)
375	0.004	515	0.145	655	0.086
380	0.004	520	0.166	660	0.078
385	0.004	525	0.183	665	0.069
390	0.004	530	0.195	670	0.062
395	0.005	535	0.204	675	0.055
400	0.006	540	0.210	680	0.049
405	0.008	545	0.214	685	0.043
410	0.013	550	0.218	690	0.038
415	0.023	555	0.220	695	0.033
420	0.043	560	0.221	700	0.029
425	0.074	565	0.220	705	0.026
430	0.116	570	0.219	710	0.022
435	0.171	575	0.217	715	0.020
440	0.240	580	0.215	720	0.017
445	0.315	585	0.211	725	0.015
450	0.320	590	0.207	730	0.013
455	0.234	595	0.201	735	0.012
460	0.152	600	0.195	740	0.010
465	0.105	605	0.188	745	0.009
470	0.073	610	0.179	750	0.008
475	0.053	615	0.169	755	0.007
480	0.044	620	0.158	760	0.006
485	0.042	625	0.147	765	0.005
490	0.046	630	0.136	770	0.005
495	0.057	635	0.125	775	0.004
500	0.074	640	0.114	780	0.004
505	0.097	645	0.104		
510	0.122	650	0.095		

Test Results: Goniometer

Results include unit flux, distribution, efficacy, and electrical power for sample number L16043.
Dialight unit model number FLx467xC4NP

Electrical Measurements:

Input Voltage: 120 (VAC)
Input current: 1.174 (A)
Input Power: 140.6 (W)
Power Factor: 0.997

Photometric measurements:

Absolute Luminous Flux: 14128 (lumens)
Luminous Efficacy: 100.5 (lumens/W)

Intensity Summary:

<u>INTENSITY (CANDLEPOWER) SUMMARY</u>						
ANGLE	ALONG	30	45	60	ACROSS	OUTPUT LUMENS
0	7875	7875	7875	7875	7875	
5	7761	7740	7720	7702	7655	290
15	8031	7286	6843	6574	6188	1551
25	8012	6550	5510	4972	4980	2533
35	6881	5207	4706	4438	4064	3069
45	6329	4431	3608	3377	2790	3185
55	3643	3033	2068	1216	474	2410
65	1162	1127	272	104	43	970
75	25	39	22	53	44	103
85	4	3	3	3	2	17
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	0

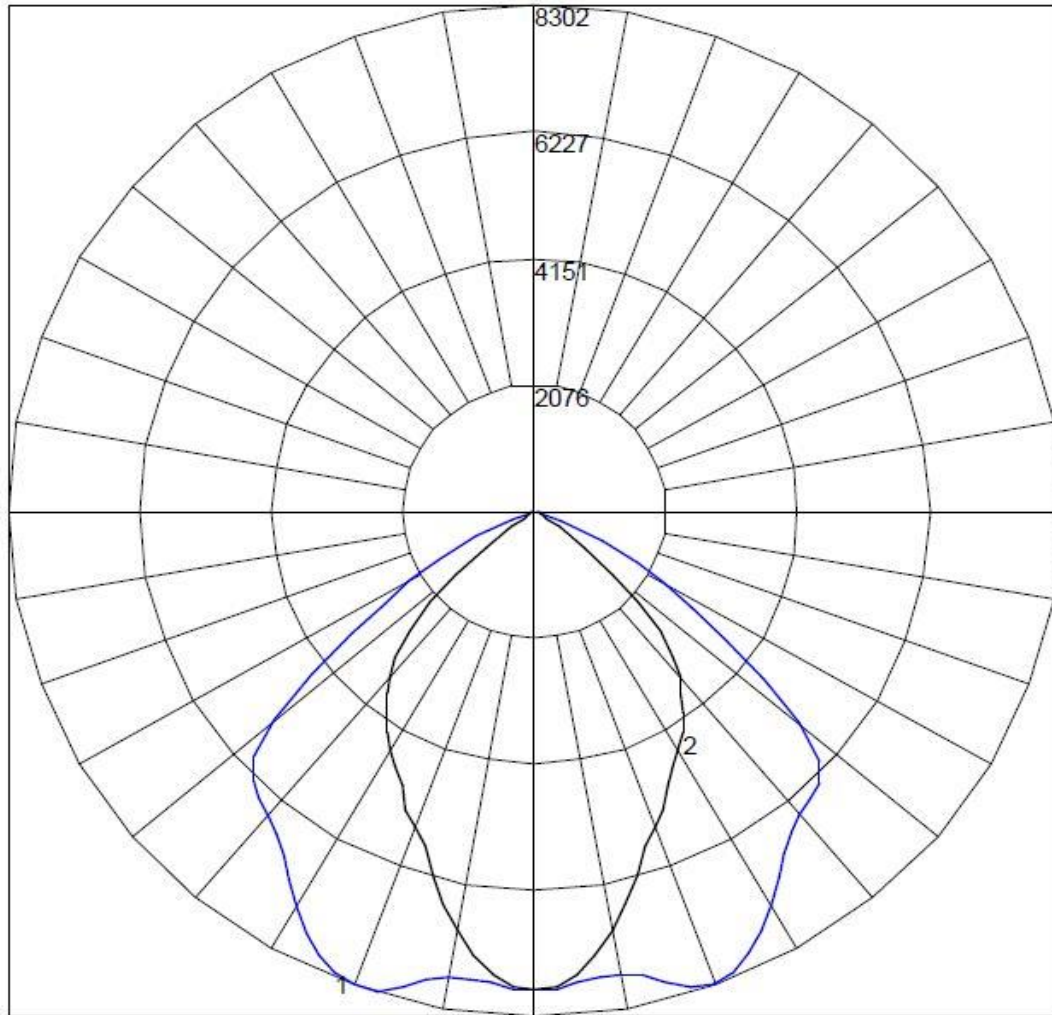
ZONAL LUMEN AND PERCENTAGES

ZONE	LUMENS	% LUMINAIRE
0-30	5864.55	41.5%
0-40	9051.6	64.1%
0-60	13657.67	96.7%
60-90	744.32	5.3%
0-90	14126.91	100.0%
90-180	0	0.0%
0-180	14126.91	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	107.97	72.44

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
66.52	106.50	104.41	134.85	6	7

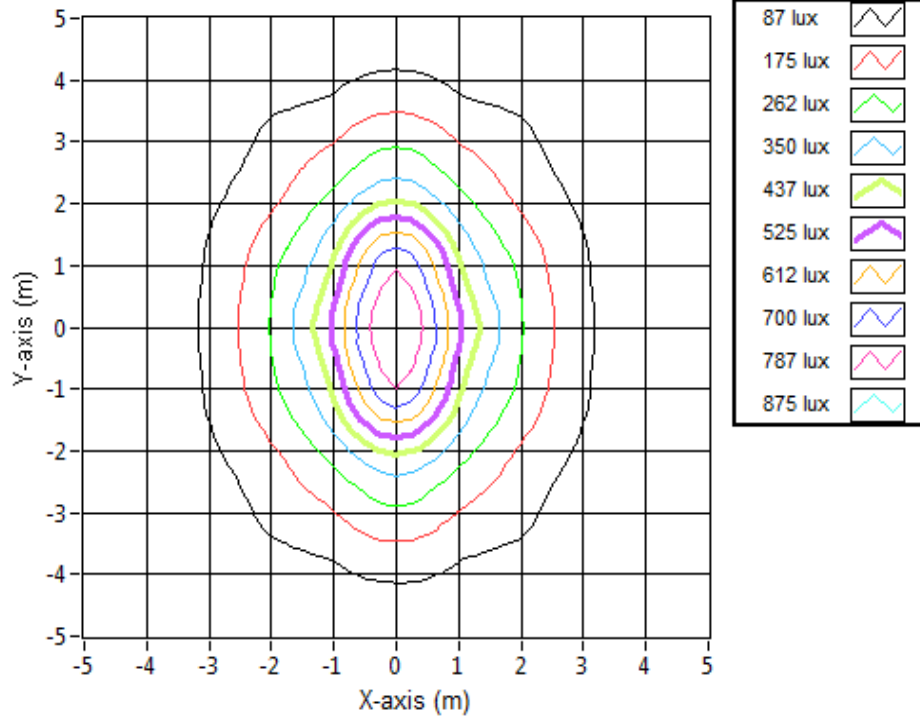
Total Luminous Flux	Field (%)	Field Flux (lm)	Beam Flux (%)	Beam Flux (lm)	Beam Spill (%)	Spill Flux (lm)
14045.79	97.80	13736.73	70.72	9933.62	2.20	309.06

Test Results: Goniometer

Results continued from previous page.

Illuminance Plot:

Illuminance Contour Graph



Illuminance-Cone of Light:

Mounting Height (m)	Beam Cone Width (m)	Orthogonal Beam Cone Width (m)	Projected Illuminance (lux)
3.048	8.39	4.46	847.6
6.096	16.77	8.93	211.9
9.144	25.16	13.39	94.2
12.192	33.55	17.86	53.0
15.24	41.93	22.32	33.9
18.288	50.32	26.79	23.5
21.336	58.70	31.25	17.3
24.384	67.09	35.72	13.2
27.432	75.48	40.18	10.5
30.48	83.86	44.65	8.5

Test Results: In Situ Temperature Measurement Test

Results include maximum LED chip temperature for sample number L16043.
Dialight unit model number FLx467xC4NP

LED identified as Cree part number XTE.

LED drive current (as indicated by customer): 380 (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:

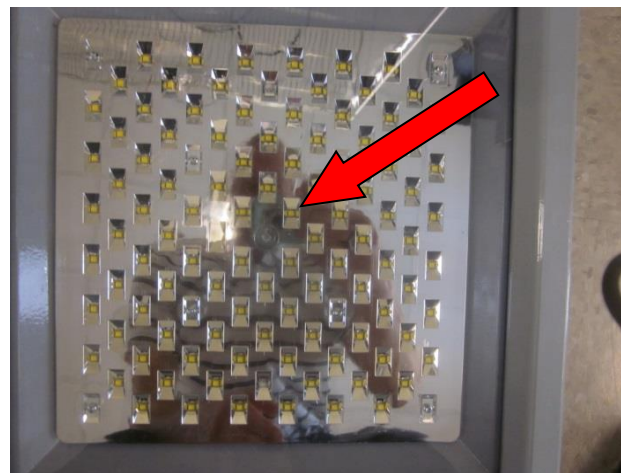
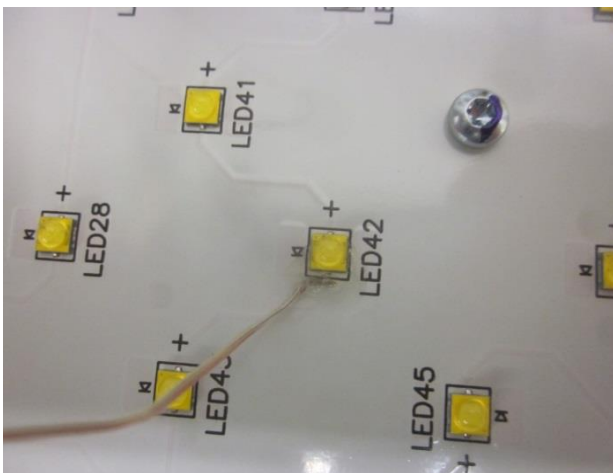
Maximum Power at Indicated Current: 1.33 (W)
Maximum Source Temperature: 143.4 (°C)

Test Conditions:

Temperature Measurement Location: See Photographs Below
Ambient Temperature: $25^{\circ} \pm 5^{\circ}$ (°C)
Ambient temperature at time of measurement: 23.9 (°C)
Relative humidity at time of measurement: 22%

Results:

Measured LED source temperature: 71.9 (°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 Precision	1715A
TDK-Lambda	GEN1500W
Fluke 8808A Digit Multimeter	8808A
TPI Digital Thermometer 343	TPI 343
TPI Digital 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. This report shall not be reproduced, except in full, without the express written permission of Dialight Optics Laboratory.

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Approved Signatory