

Test Report

Report Number: L17002

Date: Feb 7, 2017

Issued by:

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

Test of one LED Dual Vigilant Floodlight
Unit manufacturer: Dialight Corporation
Unit model number: FLxBM0xC5NG

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 25, 2017 through February 5, 2017

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

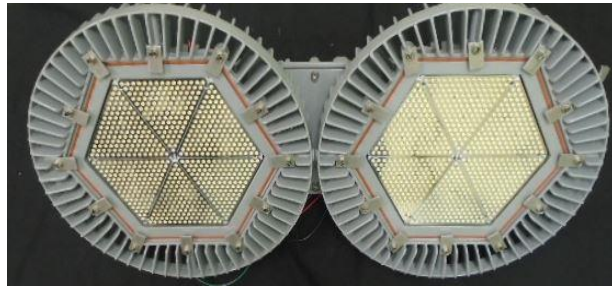
Description of sample:

Sample Number: L17002
Manufacturer: Dialight Corporation
Product Name: LED Dual Vigilant Floodlight
Description: LED Dual Vigilant Floodlight
Model Number: FLxBM0xC5NG

Report Summary

Sample number L17002
Dialight unit model number FLxBM0xC5NG

Photograph(s) of sample:



*Photographs not to scale. For reference only.

Summary of Results:

	<u>Integrating Sphere</u>	<u>Goniophotometer</u>
Luminous Flux:	54170 (lumens)	54411 (lumens)
Electrical Power:	484.0 (W)	485.0 (W)
Luminous Efficacy:	111.9 (lumens/W)	112.2 (lumens/W)

Electrical Measurements:

Input Power (347VAC): 484.0 (W)
Power Factor (347VAC): 0.997
Current ATHD % (347VAC): 7.3
Input Power (480VAC): 445.3 (W)
Power Factor (480VAC): 0.977
Current ATHD % (480VAC): 11.76

Color Measurements:

Correlated Color Temperature (CCT): 5001
Color Rendering Index (CRI): 78.6
Chromaticity Coordinate (x): 0.345
Chromaticity Coordinate (y): 0.354
Chromaticity Coordinate (u'): 0.211
Chromaticity Coordinate (v'): 0.324
DUV: 0.001

Temperature Measurements:

In Situ LED Source Temperature: 61.2 (°C)

Test Results: Integrating Sphere

Results include unit color, flux, efficacy and electrical power for sample number L17002.

Dialight unit model number FLxBM0xC5NG

Test Conditions:

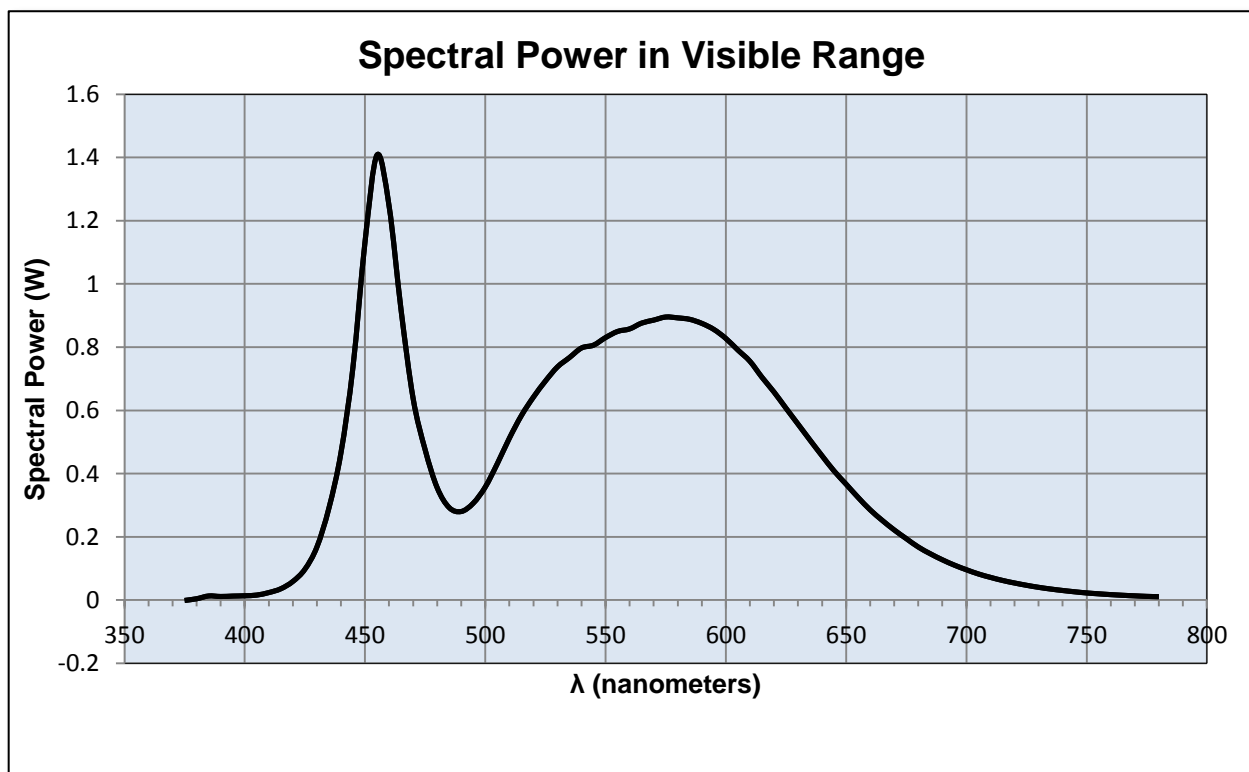
Ambient Temperature: 25 ± 1 (°C)

Electrical Measurements:

Input Voltage: 347 (VAC)
Input Current: 1.143 (A)
Input Power: 484.0 (W)
Input Power Factor: 0.997
Current ATHD: 7.3 (%)

Photometric measurements:

Luminous Flux: 54170 (lumens)
Luminous Efficacy: 111.9 (lumens/W)
Correlated Color Temperature (CCT): 5001 (K)
CRI -Ra: 78.6
CRI -R9: -9.2
DUV: 0.001
CIE Coordinate (x): 0.345
CIE Coordinate (y): 0.354
CIE Coordinate (u'): 0.211
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	-0.001	515	0.584	655	0.325
380	0.004	520	0.642	660	0.285
385	0.013	525	0.693	665	0.252
390	0.011	530	0.738	670	0.222
395	0.013	535	0.767	675	0.194
400	0.014	540	0.797	680	0.168
405	0.016	545	0.806	685	0.147
410	0.024	550	0.830	690	0.127
415	0.036	555	0.850	695	0.111
420	0.059	560	0.858	700	0.096
425	0.097	565	0.876	705	0.083
430	0.168	570	0.885	710	0.072
435	0.291	575	0.895	715	0.062
440	0.466	580	0.893	720	0.054
445	0.737	585	0.888	725	0.047
450	1.132	590	0.875	730	0.040
455	1.408	595	0.856	735	0.035
460	1.247	600	0.828	740	0.030
465	0.917	605	0.791	745	0.026
470	0.638	610	0.755	750	0.023
475	0.475	615	0.705	755	0.020
480	0.355	620	0.658	760	0.017
485	0.292	625	0.607	765	0.015
490	0.280	630	0.557	770	0.013
495	0.306	635	0.506	775	0.012
500	0.358	640	0.456	780	0.011
505	0.432	645	0.408		
510	0.512	650	0.367		

Test Results: Goniometer

Results include unit flux, distribution, efficacy, and electrical power for sample number L17002.
Dialight unit model number FLxBM0xC5NG

Electrical Measurements:

Input Voltage: 347 (VAC)
Input current: 1.412 (A)
Input Power: 485.0 (W)
Power Factor: 0.994

Photometric measurements:

Absolute Luminous Flux: 54411 (lumens)
Luminous Efficacy: 112.2 (lumens/W)

Intensity Summary:

<u>INTENSITY (CANDLEPOWER) SUMMARY</u>						
ANGLE	ALONG	25	45	72.5	ACROSS	OUTPUT LUMENS
0	20858	20858	20858	20858	20858	
5	20997	21012	21017	20992	20933	782
15	22166	22279	22306	22268	22157	4634
25	24232	24403	24443	24382	24259	9351
35	23276	23430	23307	23205	23221	13597
45	16819	16840	16770	16648	16618	13948
55	7151	6996	7124	7054	6926	8965
65	1336	1325	1342	1353	1344	2824
75	50	52	51	51	52	286
85	9	8	8	8	8	22
95	0	0	0	0	0	1
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

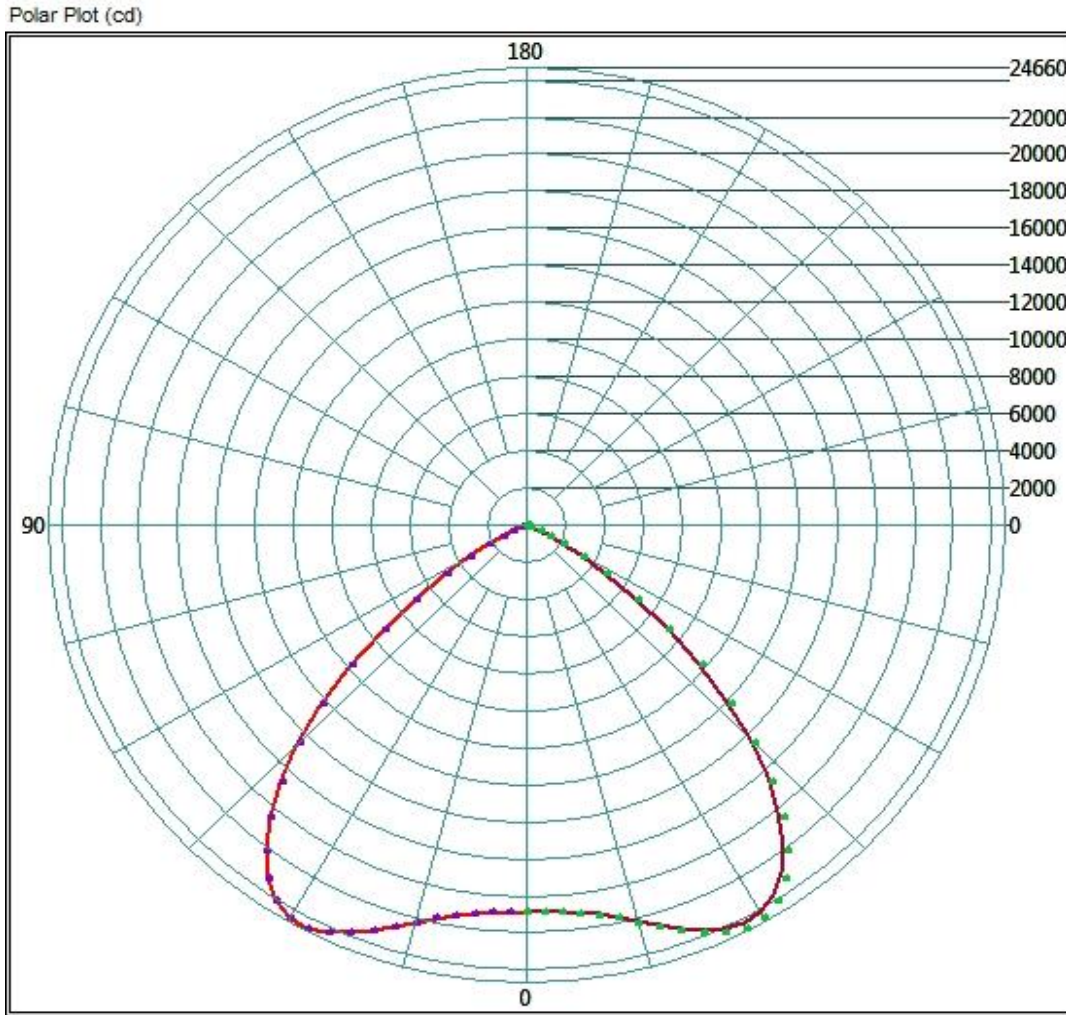
ZONAL LUMEN AND PERCENTAGES

ZONE	LUMENS	% LUMINAIRE
0-30	21200.18	39.0%
0-40	35638.11	65.5%
0-60	53238.76	97.8%
60-90	1978.34	3.6%
0-90	54411.19	100.0%
90-180	0	0.0%
0-180	54411.19	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	102.69	102.65

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
90.70	94.38	121.68	123.79	6	6

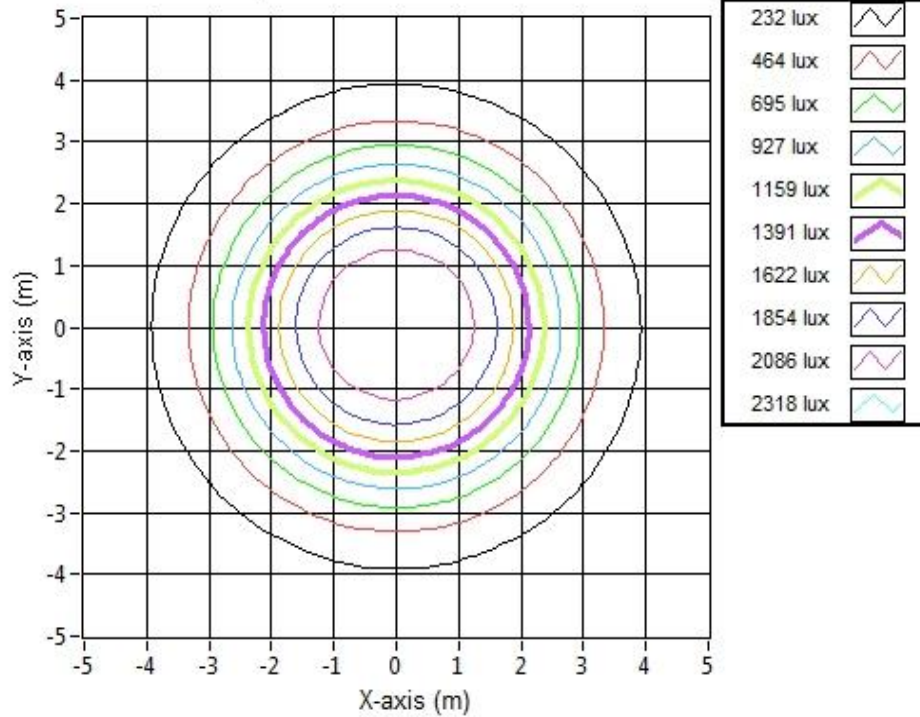
Total Luminous Flux	Field (%)	Field Flux (lm)	Beam Flux (%)	Beam Flux (lm)	Beam Spill (%)	Spill Flux (lm)
54143.35	98.09	53110.08	85.02	46030.99	1.91	1033.26

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	7.62	7.62	2245.1
6.096	15.24	15.23	561.3
9.144	22.86	22.85	249.5
12.192	30.48	30.46	140.3
15.24	38.11	38.08	89.8
18.288	45.73	45.70	62.4
21.336	53.35	53.31	45.8
24.384	60.97	60.93	35.1
27.432	68.59	68.54	27.7
30.48	76.21	76.16	22.5

Test Results: In Situ Temperature Measurement Test

Results include maximum LED chip temperature for sample number L17002.
Dialight unit model number FLxBM0xC5NG

LED identified as Nichia part number NT2W757.

LED drive current (as indicated by customer): 100 (mA)

LED Specifications:

LED specifications are taken from LED manufacturer datasheet:

Maximum Forward Current (If): 300 (mA)
Maximum Rated Power Dissipation: 1.05 (W)
Maximum Junction Temp. (Tj): 120 (°C)
Thermal Resistance (Rth): 18 (°C/W)

Derived Specifications:

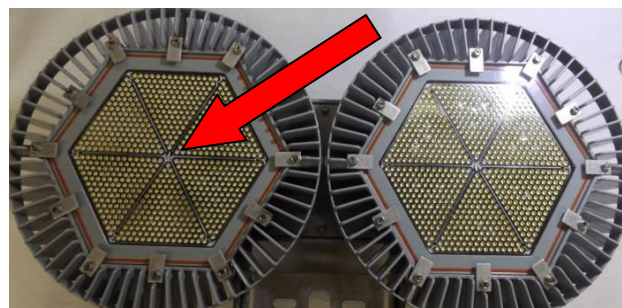
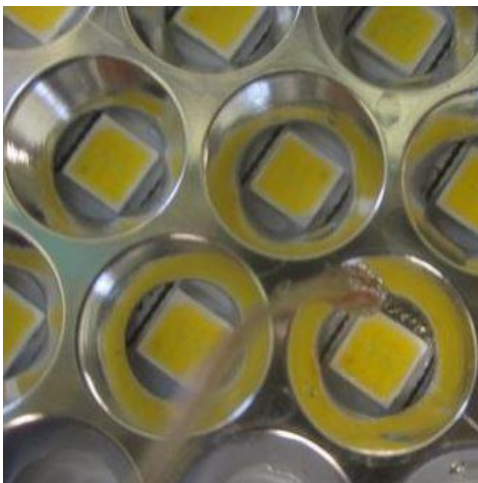
Maximum Power at Indicated Current: 0.35 (W)
Maximum Source Temperature: 113.7 (°C)

Test Conditions:

Temperature Measurement Location: See Photographs Below
Ambient Temperature: $25^{\circ} \pm 5^{\circ}$ (°C)
Ambient temperature at time of measurement: 23.8 (°C)
Relative humidity at time of measurement: 10%

Results:

Measured LED source temperature: 61.2 (°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
Fluke 971 Humidity Meter	971
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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