

Test Report

Report Number: L19092

Date: Nov 6, 2019

Issued by:

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

Test of one GRP Linear
Unit manufacturer: Dialight Corporation
Unit model number: P4xBMC26AxxxxN

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: October 30, 2019 through November 1, 2019

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

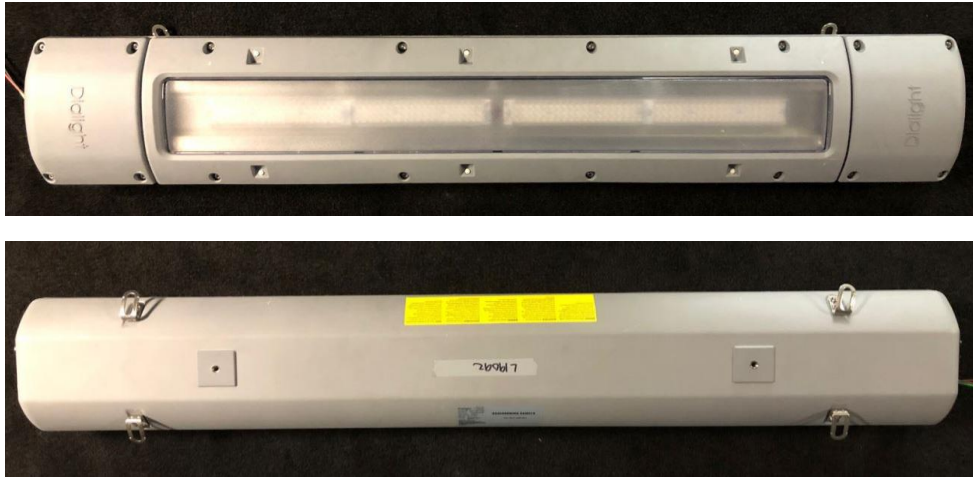
Description of sample:

Sample Number: L19092
Manufacturer: Dialight Corporation
Product Name: SafeSite GRP LED Linear, 4ft, Medium
Description: GRP Linear
Model Number: P4xBMC26AxxxxN

Report Summary

Sample number L19092
Dialight unit model number P4xBMC26AxxxxN

Photograph(s) of sample:



*Photographs not to scale. For reference only.

Summary of Results:

	<u>Integrating Sphere</u>	<u>Goniophotometer</u>
Luminous Flux:	5623 (lumens)	5629 (lumens)
Electrical Power:	48.0 (W)	48.0 (W)
Luminous Efficacy:	117.1 (lumens/W)	117.4 (lumens/W)

Electrical Measurements:

Input Power (120 VAC): 48.0 (W)
Power Factor (120 VAC): 0.992
Current ATHD % (120 VAC): 12.65
Input Power (277 VAC): 47.2 (W)
Power Factor (277 VAC): 0.979
Current ATHD % (277 VAC): 10.3

Color Measurements:

Correlated Color Temperature (CCT): 5144
Color Rendering Index (CRI): 84.94
Chromaticity Coordinate (x): 0.342
Chromaticity Coordinate (y): 0.355
Chromaticity Coordinate (u'): 0.208
Chromaticity Coordinate (v'): 0.486
DUV: 0.0032

Temperature Measurements:

In Situ LED Source Temperature: 51.8 (°C)

Test Results: Integrating Sphere

Results include unit color, flux, efficacy and electrical power for sample number L19092.

Dialight unit model number P4xBMC26AxxxxN

Test Conditions:

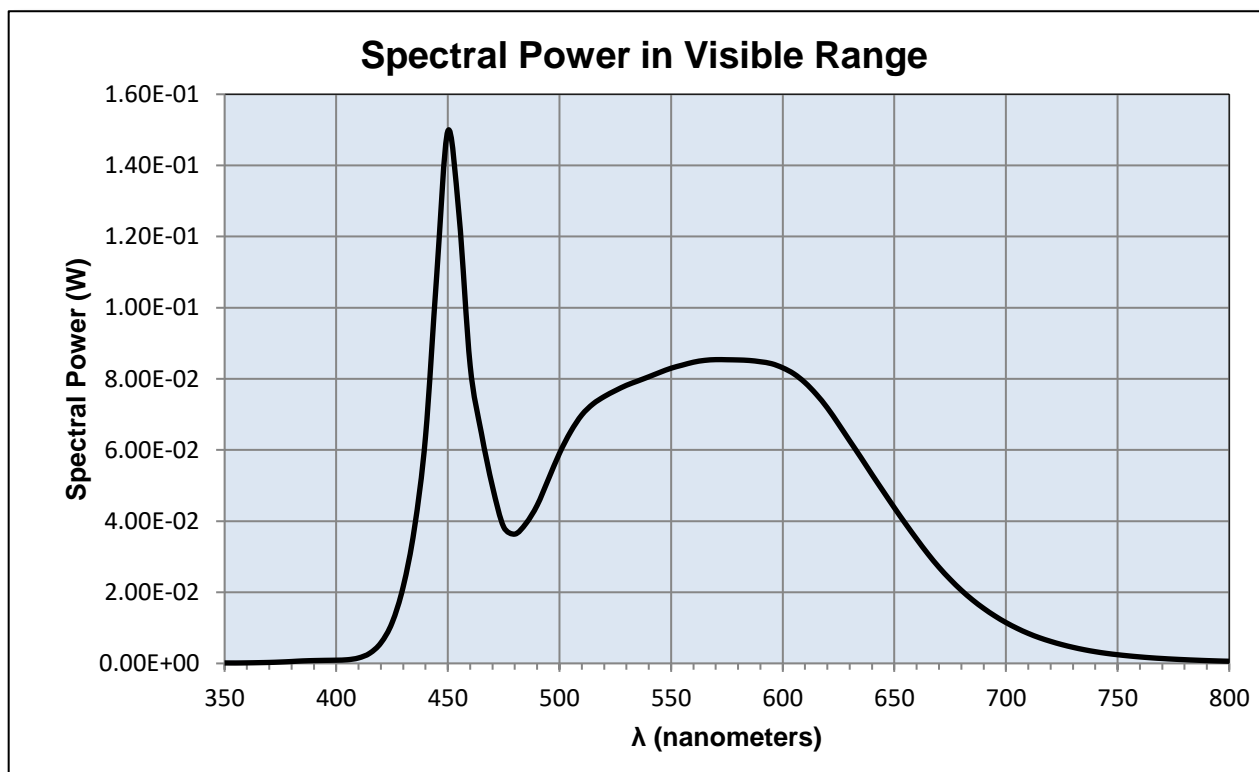
Ambient Temperature: 25 ± 1 (°C)

Electrical Measurements:

Input Voltage: 119.9 (VAC)
 Input Current: 0.404 (A)
 Input Power: 48.0 (W)
 Input Power Factor: 0.992
 Current ATHD: 12.65 (%)

Photometric measurements:

Luminous Flux: 5623 (lumens)
 Luminous Efficacy: 117.1 (lumens/W)
 Correlated Color Temperature (CCT): 5144 (K)
 CRI -Ra: 84.94
 CRI -R9: 18.05
 DUV: 0.0032
 CIE Coordinate (x): 0.342
 CIE Coordinate (y): 0.355
 CIE Coordinate (u'): 0.208
 CIE Coordinate (v'): 0.486



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)	λ (nm)	(W/nm)
350	0.00013	490	0.04446	630	0.06257	770	0.00138
355	0.00012	495	0.05172	635	0.05790	775	0.00120
360	0.00016	500	0.05908	640	0.05308	780	0.00105
365	0.00021	505	0.06514	645	0.04841	785	0.00091
370	0.00028	510	0.06985	650	0.04377	790	0.00080
375	0.00039	515	0.07293	655	0.03928	795	0.00069
380	0.00054	520	0.07501	660	0.03497	800	0.00061
385	0.00071	525	0.07668	665	0.03082		
390	0.00080	530	0.07819	670	0.02703		
395	0.00086	535	0.07938	675	0.02364		
400	0.00091	540	0.08058	680	0.02058		
405	0.00104	545	0.08183	685	0.01786		
410	0.00154	550	0.08299	690	0.01547		
415	0.00285	555	0.08386	695	0.01336		
420	0.00577	560	0.08468	700	0.01149		
425	0.01140	565	0.08519	705	0.00986		
430	0.02159	570	0.08540	710	0.00843		
435	0.03786	575	0.08537	715	0.00722		
440	0.06379	580	0.08531	720	0.00620		
445	0.10894	585	0.08517	725	0.00530		
450	0.14967	590	0.08481	730	0.00453		
455	0.12602	595	0.08427	735	0.00386		
460	0.08371	600	0.08310	740	0.00330		
465	0.06482	605	0.08142	745	0.00283		
470	0.04971	610	0.07894	750	0.00244		
475	0.03837	615	0.07568	755	0.00212		
480	0.03636	620	0.07183	760	0.00183		
485	0.03935	625	0.06729	765	0.00158		

Test Results: Goniometer

Results include unit flux, distribution, efficacy, and electrical power for sample number L19092.
Dialight unit model number P4xBMC26AxxxxN

Electrical Measurements:

Input Voltage: 120 (VAC)
Input current: 0.415 (A)
Input Power: 48.0 (W)
Power Factor: 0.963

Photometric measurements:

Absolute Luminous Flux: 5629 (lumens)
Luminous Efficacy: 117.4 (lumens/W)

Intensity Summary:

<u>INTENSITY (CANDLEPOWER) SUMMARY</u>						
ANGLE	ALONG	25	45	72.5	ACROSS	OUTPUT LUMENS
0	2082	2082	2082	2082	2082	
5	2095	2080	2074	2076	2068	77
15	2028	2028	2034	2045	2042	439
25	1907	1939	1976	1995	1992	794
35	1674	1749	1823	1838	1823	1068
45	1313	1388	1464	1484	1477	1146
55	881	926	969	995	999	976
65	481	503	520	519	516	641
75	204	224	248	235	226	337
85	31	53	74	78	77	127
95	0	0	5	14	17	23
105	0	0	0	0	0	1
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

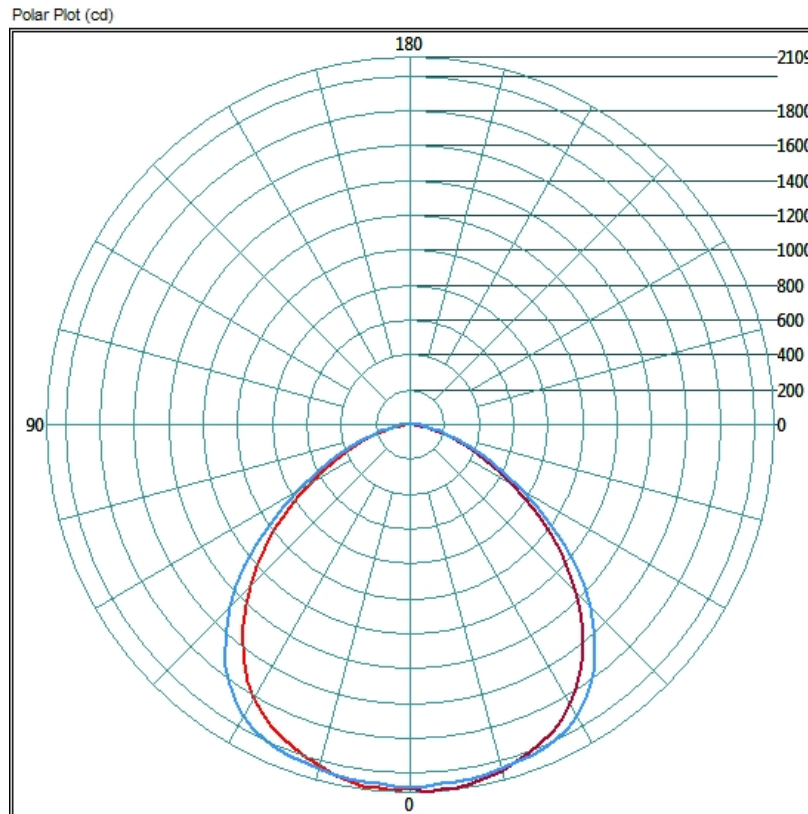
ZONAL LUMEN AND PERCENTAGES

ZONE	LUMENS	% LUMINAIRE
0-30	1819.61	32.3%
0-40	2957.23	52.5%
0-60	4865.19	86.4%
60-90	928.22	16.5%
0-90	5622.36	99.9%
90-180	13.52	0.2%
0-180	5629.28	100.0%

Test Results: Goniometer

Results continued from previous page.

Polar Plot:

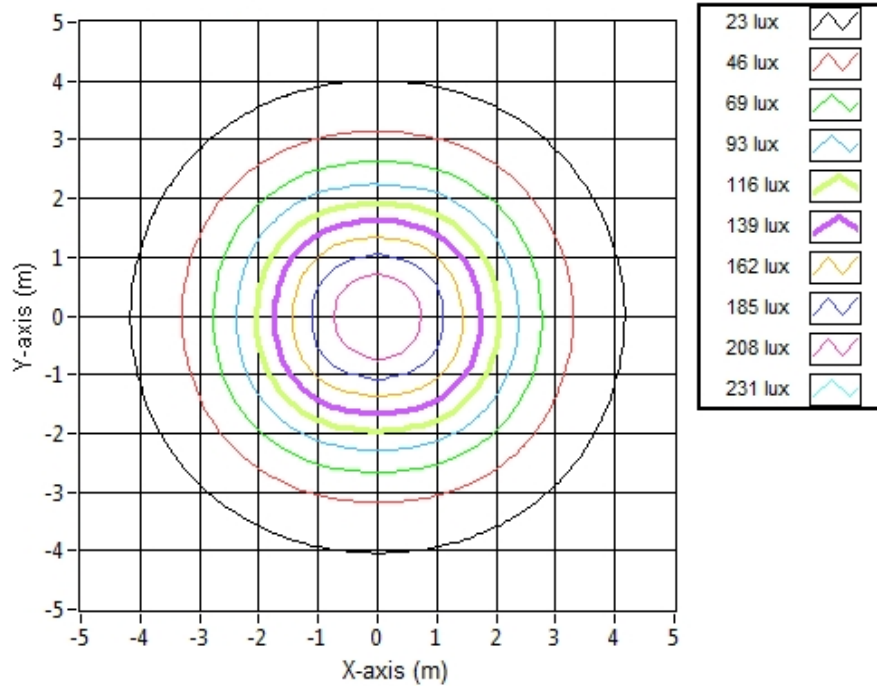


Test Results: Goniometer

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	7.72	8.45	224.1
6.096	15.45	16.89	56.0
9.144	23.17	25.34	24.9
12.192	30.90	33.79	14.0
15.24	38.62	42.23	9.0
18.288	46.35	50.68	6.2
21.336	54.07	59.13	4.6
24.384	61.80	67.57	3.5
27.432	69.52	76.02	2.8
30.48	77.25	84.46	2.2

Test Results: In Situ Temperature Measurement Test

Results include maximum LED chip temperature for sample number L19092.
Dialight unit model number P4xBMC26AxxxxN

LED identified as Seoul part number SAW8C22B-XX.

LED drive current (as indicated by customer): 36 (mA)

LED Specifications:

LED specifications are taken from LED manufacturer datasheet:

Maximum Forward Current (If): 250 (mA)
Maximum Rated Power Dissipation: 1.5 (W)
Maximum Junction Temp. (Tj): 125 (°C)
Thermal Resistance (Rth): 17 (°C/W)

Derived Specifications:

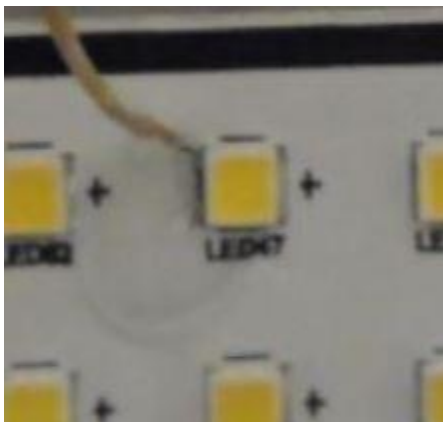
Maximum Power at Indicated Current: 0.216 (W)
Maximum Source Temperature: 121.3 (°C)

Test Conditions:

Temperature Measurement Location: See Photographs Below
Ambient Temperature: $25^{\circ} \pm 5^{\circ}$ (°C)
Ambient temperature at time of measurement: 24.1 (°C)
Relative humidity at time of measurement: 35%

Results:

Measured LED source temperature: 51.8 (°C)



Equipment Used:

Equipment Name	Model Number
Omega TC	DPi8
YOKOGAWA Digital Power Meter	11/26/3981
LSI High Speed Mirror Goniometer	6240T
Elgar AC Power Supply	CW1251P
Sorensen DC Power Supply	XHR150-7
Dialight Confirmation Sample	HB1N4N
Dialight Confirmation Sample	HB1N4J
Fluke 8808A Digit Multimeter	8808A
Step-Up Transformer	
ITL Osram Calibraton lamps for Goniometer	J9a8
ITL Osram Calibraton lamps for Goniometer	J9a8
ITL Osram Calibraton lamps for Goniometer	J9a8
Fluke 971 Humdity Meter	8/28/1902
GwINSTEK DC Power Supply	GEP172679
Dialight Confirmation Sample	1/0/1900
Labsphere calibration lamp for 2M sphere	SCL-1400
Labshere 2M sphere	Illumia Plus 2600-1
Labshere Controller	PM-150-140
Labshere Spectrameter- CDS 2600 Spectrometer	CDS-2600
Xitron Power Analyzer	9/1/1907
LED Bulb for Electrical Confirmation Test-Gold Sample	Monte Carlo
LED Bulb for Electrical Confirmation Test-Gold Sample	Monte Carlo
LED Bulb for Electrical Confirmation Test-Gold Sample	Monte Carlo

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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 Optical Engineer
 Approved Signatory