

Test Report

Report Number: L18066

Date: Aug 21, 2018

Issued by:

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

Test of one Linear

Unit manufacturer: Dialight Corporation
Unit model number: LHx5WW27xxxxN

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: August 16, 2018 through August 21, 2018

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: L18066
Manufacturer: Dialight Corporation
Product Name: 4ft Top Conduit Linear
Description: Linear
Model Number: LHx5WW27xxxxN

Report Summary

Sample number L18066
Dialight unit model number LHx5WW27xxxxxN

Photograph(s) of sample:



*Photographs not to scale. For reference only.

Summary of Results:

	<u>Integrating Sphere</u>	<u>Goniophotometer</u>
Luminous Flux:	6101 (lumens)	6078 (lumens)
Electrical Power:	51.9 (W)	52.0 (W)
Luminous Efficacy:	117.6 (lumens/W)	116.9 (lumens/W)

Electrical Measurements:

Input Power (120VAC): 51.9 (W)
Power Factor (120VAC): 0.994
Current ATHD % (120VAC): 6.314
Input Power (277VAC): 50.6 (W)
Power Factor (277VAC): 0.918
Current ATHD % (277VAC): 15.31

Color Measurements:

Correlated Color Temperature (CCT): 2620
Color Rendering Index (CRI): 82.6
Chromaticity Coordinate (x): 0.47
Chromaticity Coordinate (y): 0.417
Chromaticity Coordinate (u'): 0.266
Chromaticity Coordinate (v'): 0.354
DUV: 0.0017

Temperature Measurements:

In Situ LED Source Temperature: 48.3 (°C)

Test Results: Integrating Sphere

Results include unit color, flux, efficacy and electrical power for sample number L18066.

Dialight unit model number LHx5WW27xxxxxN

Test Conditions:

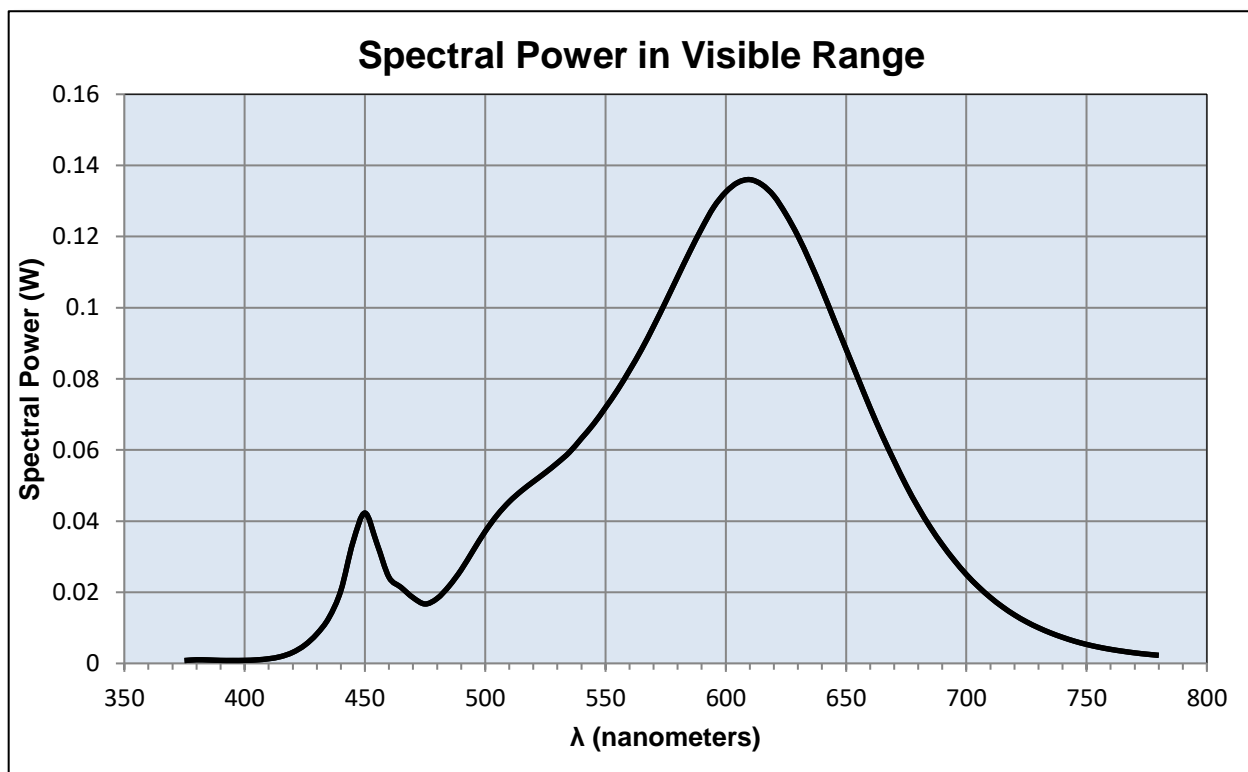
Ambient Temperature: 25 ± 1 (°C)

Electrical Measurements:

Input Voltage: 120 (VAC)
Input Current: 0.435 (A)
Input Power: 51.9 (W)
Input Power Factor: 0.994
Current ATHD: 6.314 (%)

Photometric measurements:

Luminous Flux: 6101 (lumens)
Luminous Efficacy: 117.6 (lumens/W)
Correlated Color Temperature (CCT): 2620 (K)
CRI -Ra: 82.6
CRI -R9: 8.9
DUV: 0.0017
CIE Coordinate (x): 0.47
CIE Coordinate (y): 0.417
CIE Coordinate (u'): 0.266
CIE Coordinate (v'): 0.354



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	0.001	515	0.048	655	0.080
380	0.001	520	0.051	660	0.072
385	0.001	525	0.054	665	0.064
390	0.001	530	0.056	670	0.057
395	0.001	535	0.059	675	0.050
400	0.001	540	0.063	680	0.044
405	0.001	545	0.067	685	0.038
410	0.001	550	0.072	690	0.033
415	0.002	555	0.077	695	0.029
420	0.003	560	0.082	700	0.025
425	0.005	565	0.088	705	0.022
430	0.008	570	0.095	710	0.019
435	0.013	575	0.102	715	0.016
440	0.020	580	0.109	720	0.014
445	0.034	585	0.116	725	0.012
450	0.042	590	0.122	730	0.010
455	0.034	595	0.128	735	0.009
460	0.024	600	0.133	740	0.007
465	0.021	605	0.135	745	0.006
470	0.018	610	0.136	750	0.005
475	0.017	615	0.135	755	0.005
480	0.018	620	0.131	760	0.004
485	0.022	625	0.126	765	0.003
490	0.026	630	0.120	770	0.003
495	0.032	635	0.113	775	0.003
500	0.037	640	0.105	780	0.002
505	0.042	645	0.097		
510	0.045	650	0.088		

Test Results: Goniometer

Results include unit flux, distribution, efficacy, and electrical power for sample number L18066.
Dialight unit model number LHx5WW27xxxxxN

Electrical Measurements:

Input Voltage: 120 (VAC)
Input current: 0.44 (A)
Input Power: 52.0 (W)
Power Factor: 0.983

Photometric measurements:

Absolute Luminous Flux: 6078 (lumens)
Luminous Efficacy: 116.9 (lumens/W)

Intensity Summary:

<u>INTENSITY (CANDLEPOWER) SUMMARY</u>						
ANGLE	ALONG	23	45	67.5	ACROSS	OUTPUT LUMENS
0	2797	2797	2797	2797	2797	
5	2782	2782	2782	2782	2782	104
15	2661	2661	2661	2661	2661	578
25	2389	2389	2389	2389	2389	991
35	1893	1893	1893	1893	1893	1185
45	1303	1303	1303	1303	1303	1090
55	881	881	881	881	881	870
65	601	601	601	601	601	672
75	321	321	321	321	321	443
85	29	29	29	29	29	144
95	0	0	0	0	0	2
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

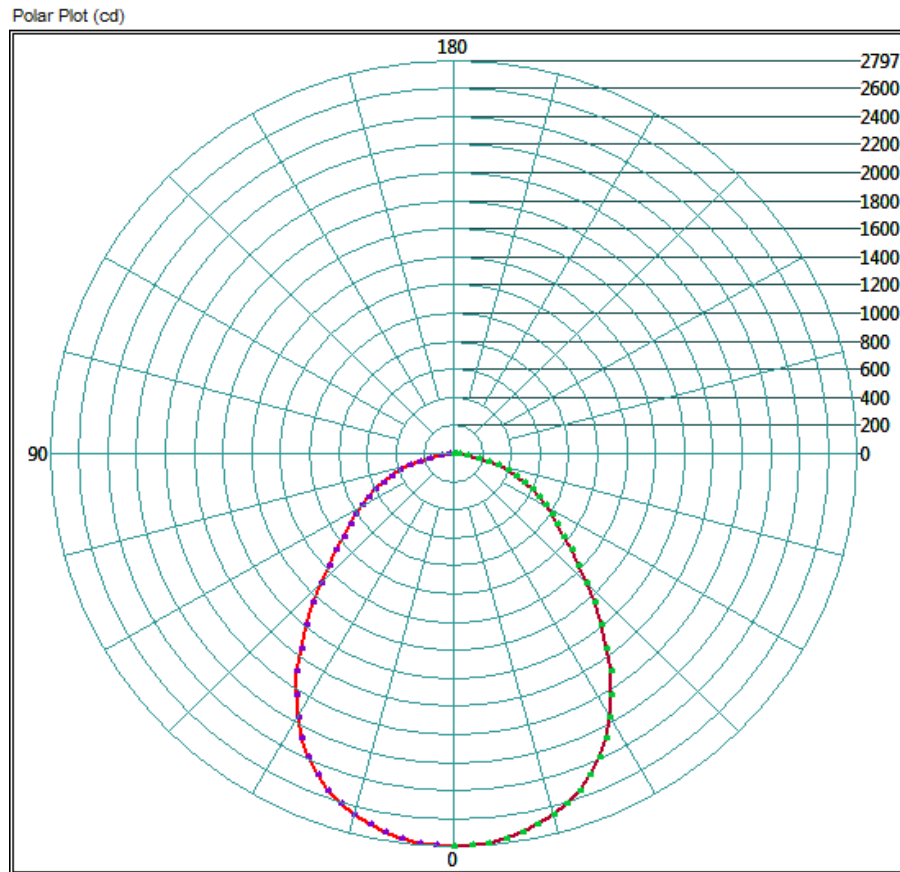
ZONAL LUMEN AND PERCENTAGES

ZONE	LUMENS	% LUMINAIRE
0-30	2260	37.2%
0-40	3428.64	56.4%
0-60	5177.6	85.2%
60-90	1074.4	17.7%
0-90	6077.76	100.0%
90-180	0	0.0%
0-180	6077.76	100.0%

Test Results: Goniometer

Results continued from previous page.

Polar Plot:

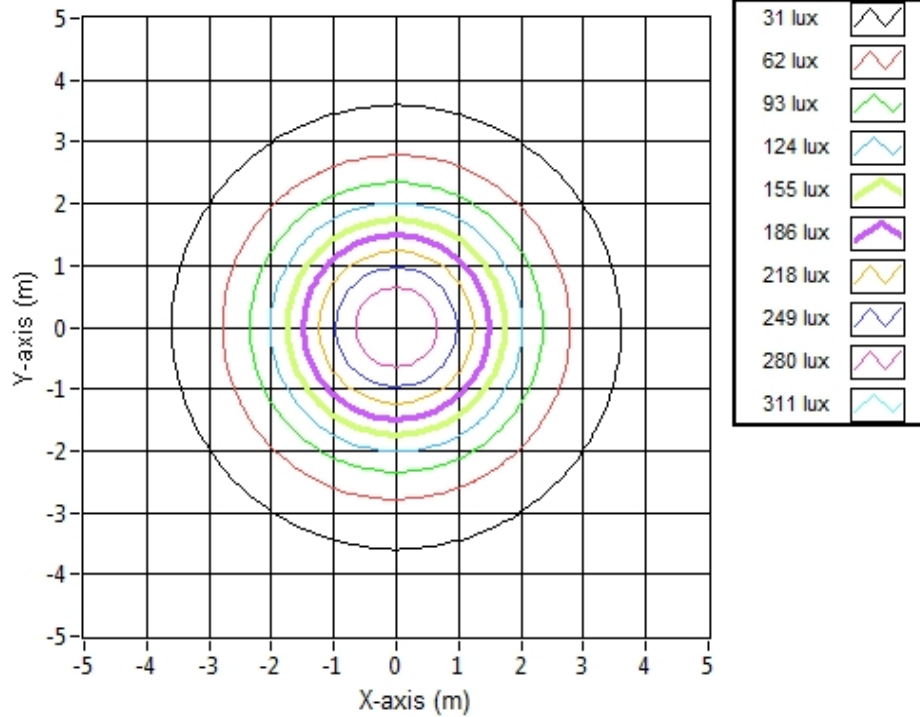


Test Results: Goniometer

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	5.74	5.74	301.0
6.096	11.48	11.48	75.3
9.144	17.21	17.21	33.4
12.192	22.95	22.95	18.8
15.24	28.69	28.69	12.0
18.288	34.43	34.43	8.4
21.336	40.16	40.16	6.1
24.384	45.90	45.90	4.7
27.432	51.64	51.64	3.7
30.48	57.38	57.38	3.0

Test Results: In Situ Temperature Measurement Test

Results include maximum LED chip temperature for sample number L18066.
Dialight unit model number LHx5WW27xxxxxN

LED identified as Seoul part number SAW8C22B.

LED drive current (as indicated by customer): 40 (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:

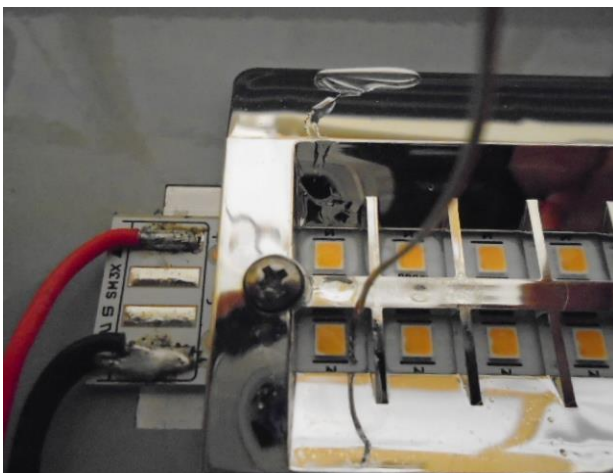
Maximum Power at Indicated Current: 0.24 (W)
Maximum Source Temperature: 120.9 (°C)

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: 48%

Results:

Measured LED source temperature: 48.3 (°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
Delta Elektronika DC Power Supply	SM.300-5
Instek AC Power Supply	APS-9501
Sorensen DC Power Supply	XHR150-7
TPI Digital Thermometer	TPI 343
Fluke 52II Thermometer	068158
Fluke 971 Humidity Meter	971
Volttech Power Analyzer	PM1000+
Volttech Universal Breakout Box	PM1000+
BK Precision	1715A
Step-Up Transformer	
Omega TC	Dpi8-C24
Agilent True RMS OLED Multimeter	U1273A
ITL Osram Calibraton lamps for Goniometer	J9a8
ITL Osram Calibraton lamps for Goniometer	J9a8
ITL Osram Calibraton lamps for Goniometer	J9a8
Adaptive Power Systems AC Power Supply	FC-210
Xitron Power Analyzer	XT2640
GwINSTEK DC Power Supply	GEP172679
Osram Sylvania Calibration Lamp for Sphere	STD-20WF-3

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.

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