

Test Report

Report Number: L18078

Date: Sep 19, 2018

Issued by:

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

Test of one Linear

Unit manufacturer: Dialight Corporation
Unit model number: LHx4MC27xxxxN

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: September 18, 2018 through September 19, 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

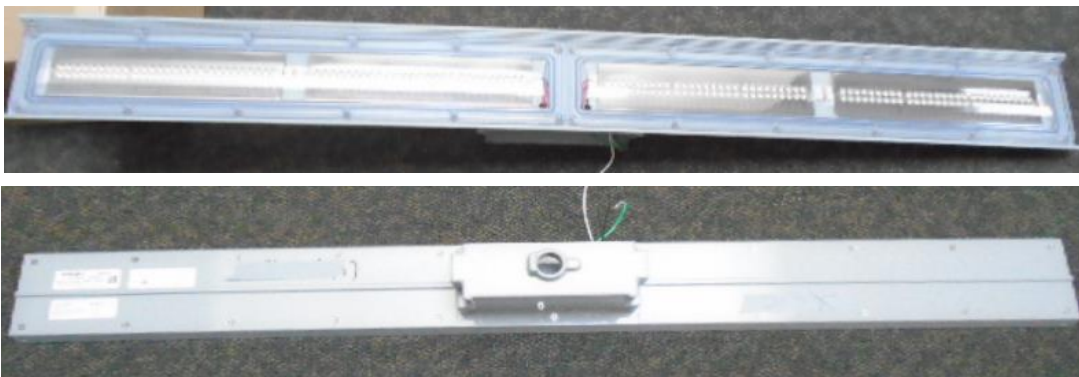
Description of sample:

Sample Number: L18078
Manufacturer: Dialight Corporation
Product Name: 4ft Top Conduit Linear
Description: Linear
Model Number: LHx4MC27xxxxN

Report Summary

Sample number L18078
Dialight unit model number LHx4MC27xxxxN

Photograph(s) of sample:



*Photographs not to scale. For reference only.

Summary of Results:

	<u>Integrating Sphere</u>	<u>Goniophotometer</u>
Luminous Flux:	7495 (lumens)	7476 (lumens)
Electrical Power:	52.0 (W)	52.2 (W)
Luminous Efficacy:	144.2 (lumens/W)	143.3 (lumens/W)

Electrical Measurements:

Input Power (120VAC): 52.0 (W)
Power Factor (120VAC): 0.994
Current ATHD % (120VAC): 6.267
Input Power (277VAC): 50.6 (W)
Power Factor (277VAC): 0.918
Current ATHD % (277VAC): 15.42

Color Measurements:

Correlated Color Temperature (CCT): 5014
Color Rendering Index (CRI): 85.6
Chromaticity Coordinate (x): 0.345
Chromaticity Coordinate (y): 0.354
Chromaticity Coordinate (u'): 0.211
Chromaticity Coordinate (v'): 0.324
DUV: 0.0012

Temperature Measurements:

In Situ LED Source Temperature: 52.4 (°C)

Test Results: Integrating Sphere

Results include unit color, flux, efficacy and electrical power for sample number L18078.

Dialight unit model number LHx4MC27xxxxxN

Test Conditions:

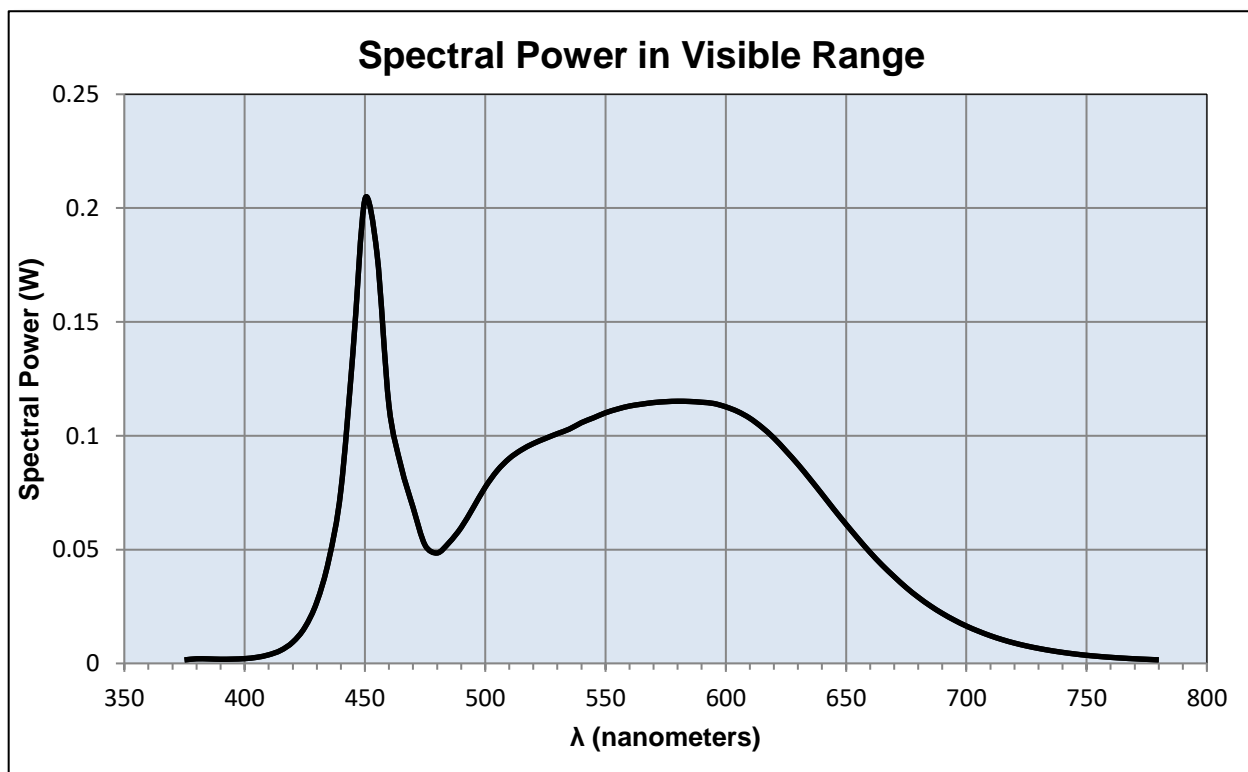
Ambient Temperature: 25 ± 1 (°C)

Electrical Measurements:

Input Voltage: 120 (VAC)
 Input Current: 0.436 (A)
 Input Power: 52.0 (W)
 Input Power Factor: 0.994
 Current ATHD: 6.267 (%)

Photometric measurements:

Luminous Flux: 7495 (lumens)
 Luminous Efficacy: 144.2 (lumens/W)
 Correlated Color Temperature (CCT): 5014 (K)
 CRI -Ra: 85.6
 CRI -R9: 22.5
 DUV: 0.0012
 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:

λ (nm)	(W/nm)	λ (nm)	(W/nm)	λ (nm)	(W/nm)
375	0.002	515	0.094	655	0.055
380	0.002	520	0.097	660	0.049
385	0.002	525	0.099	665	0.043
390	0.002	530	0.101	670	0.038
395	0.002	535	0.103	675	0.033
400	0.002	540	0.106	680	0.029
405	0.003	545	0.108	685	0.025
410	0.004	550	0.110	690	0.022
415	0.006	555	0.112	695	0.019
420	0.009	560	0.113	700	0.016
425	0.016	565	0.114	705	0.014
430	0.027	570	0.115	710	0.012
435	0.046	575	0.115	715	0.010
440	0.076	580	0.115	720	0.009
445	0.136	585	0.115	725	0.008
450	0.204	590	0.115	730	0.007
455	0.180	595	0.114	735	0.006
460	0.113	600	0.113	740	0.005
465	0.087	605	0.111	745	0.004
470	0.069	610	0.108	750	0.004
475	0.052	615	0.104	755	0.003
480	0.049	620	0.099	760	0.003
485	0.053	625	0.093	765	0.002
490	0.060	630	0.087	770	0.002
495	0.068	635	0.081	775	0.002
500	0.077	640	0.074	780	0.002
505	0.085	645	0.068		
510	0.090	650	0.061		

Test Results: Goniometer

Results include unit flux, distribution, efficacy, and electrical power for sample number L18078.
Dialight unit model number LHx4MC27xxxxxN

Electrical Measurements:

Input Voltage: 120 (VAC)
Input current: 0.443 (A)
Input Power: 52.2 (W)
Power Factor: 0.983

Photometric measurements:

Absolute Luminous Flux: 7476 (lumens)
Luminous Efficacy: 143.3 (lumens/W)

Intensity Summary:

<u>INTENSITY (CANDLEPOWER) SUMMARY</u>						
ANGLE	ALONG	23	45	67.5	ACROSS	OUTPUT LUMENS
0	3020	3020	3020	3020	3020	
5	3073	3073	3073	3073	3073	114
15	3087	3087	3087	3087	3087	661
25	2996	2996	2996	2996	2996	1201
35	2698	2698	2698	2698	2698	1631
45	1859	1859	1859	1859	1859	1533
55	1384	1384	1384	1384	1384	1319
65	550	550	550	550	550	885
75	31	31	31	31	31	120
85	4	4	4	4	4	12
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

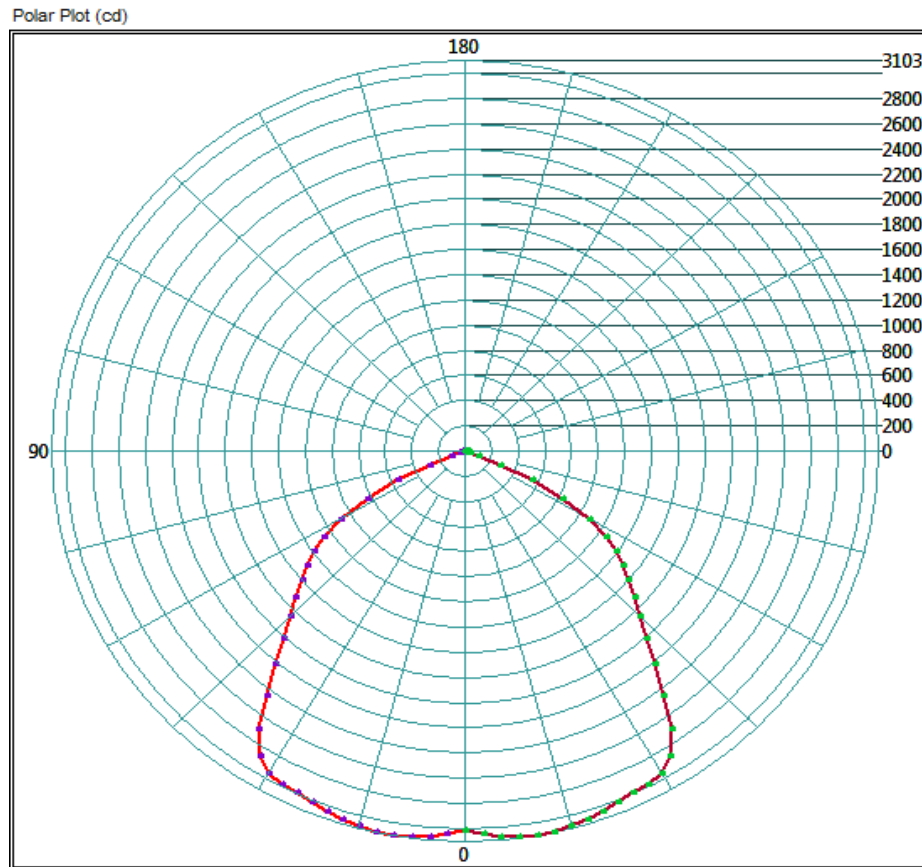
ZONAL LUMEN AND PERCENTAGES

ZONE	LUMENS	% LUMINAIRE
0-30	2760.16	36.9%
0-40	4406.72	58.9%
0-60	7005.44	93.7%
60-90	726.24	9.7%
0-90	7476.32	100.0%
90-180	0	0.0%
0-180	7476.32	100.0%

Test Results: Goniometer

Results continued from previous page.

Polar Plot:

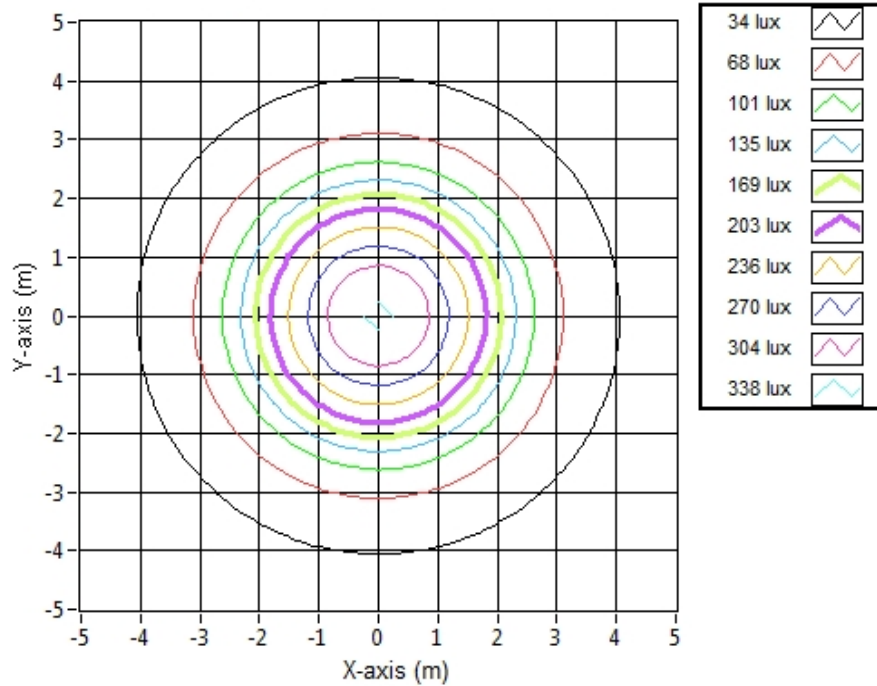


Test Results: Goniometer

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	7.83	7.83	325.1
6.096	15.67	15.67	81.3
9.144	23.50	23.50	36.1
12.192	31.34	31.34	20.3
15.24	39.17	39.17	13.0
18.288	47.00	47.00	9.0
21.336	54.84	54.84	6.6
24.384	62.67	62.67	5.1
27.432	70.51	70.51	4.0
30.48	78.34	78.34	3.3

Test Results: In Situ Temperature Measurement Test

Results include maximum LED chip temperature for sample number L18078.
Dialight unit model number LHx4MC27xxxxxN

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:

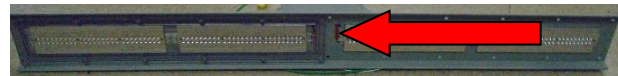
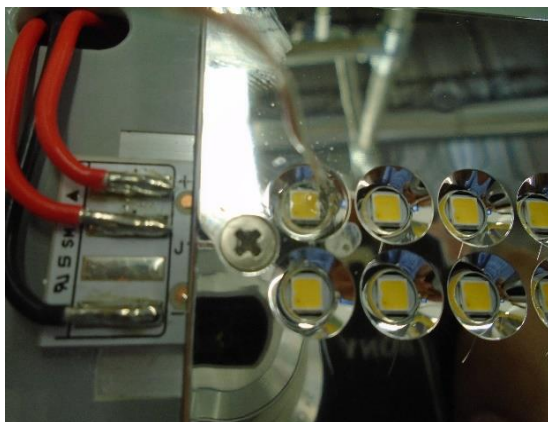
Maximum Power at Indicated Current: 0.24 (W)
Maximum Source Temperature: 120.9 (°C)

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: 59%

Results:

Measured LED source temperature: 52.4 (°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
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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.

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Optical Engineer
Approved Signatory