

# Test Report

Report Number: L18015

Date: Jun 11, 2018

Issued by:

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

Test of one 4' Linear LP  
Unit manufacturer: Dialight Corporation  
Unit model number: LPx3N4H2W

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:** March 12, 2018 through June 7, 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: L18015  
Manufacturer: Dialight Corporation  
Product Name: 4' Linear LP  
Description: 4' Linear LP  
Model Number: LPx3N4H2W

## Report Summary

Sample number L18015  
Dialight unit model number LPx3N4H2W

### Photograph(s) of sample:



\*Photographs not to scale. For reference only.

### Summary of Results:

	<u>Integrating Sphere</u>	<u>Goniophotometer</u>
Luminous Flux:	7009 (lumens)	6913 (lumens)
Electrical Power:	59.2 (W)	59.3 (W)
Luminous Efficacy:	118.4 (lumens/W)	116.7 (lumens/W)

### Electrical Measurements:

Input Power (120VAC): 59.2 (W)  
 Power Factor (120VAC): 0.991  
 Current ATHD % (120VAC): 11.94  
 Input Power (277VAC): 58.9 (W)  
 Power Factor (277VAC): 0.951  
 Current ATHD % (277VAC): 17.3

### Color Measurements:

Correlated Color Temperature (CCT): 3772  
 Color Rendering Index (CRI): 83.5  
 Chromaticity Coordinate (x): 0.391  
 Chromaticity Coordinate (y): 0.382  
 Chromaticity Coordinate (u'): 0.23  
 Chromaticity Coordinate (v'): 0.337  
 DUV: 0.00057

### Temperature Measurements:

In Situ LED Source Temperature: 49.0 (°C)

## Test Results: Integrating Sphere

Results include unit color, flux, efficacy and electrical power for sample number L18015.

Dialight unit model number LPx3N4H2W

### Test Conditions:

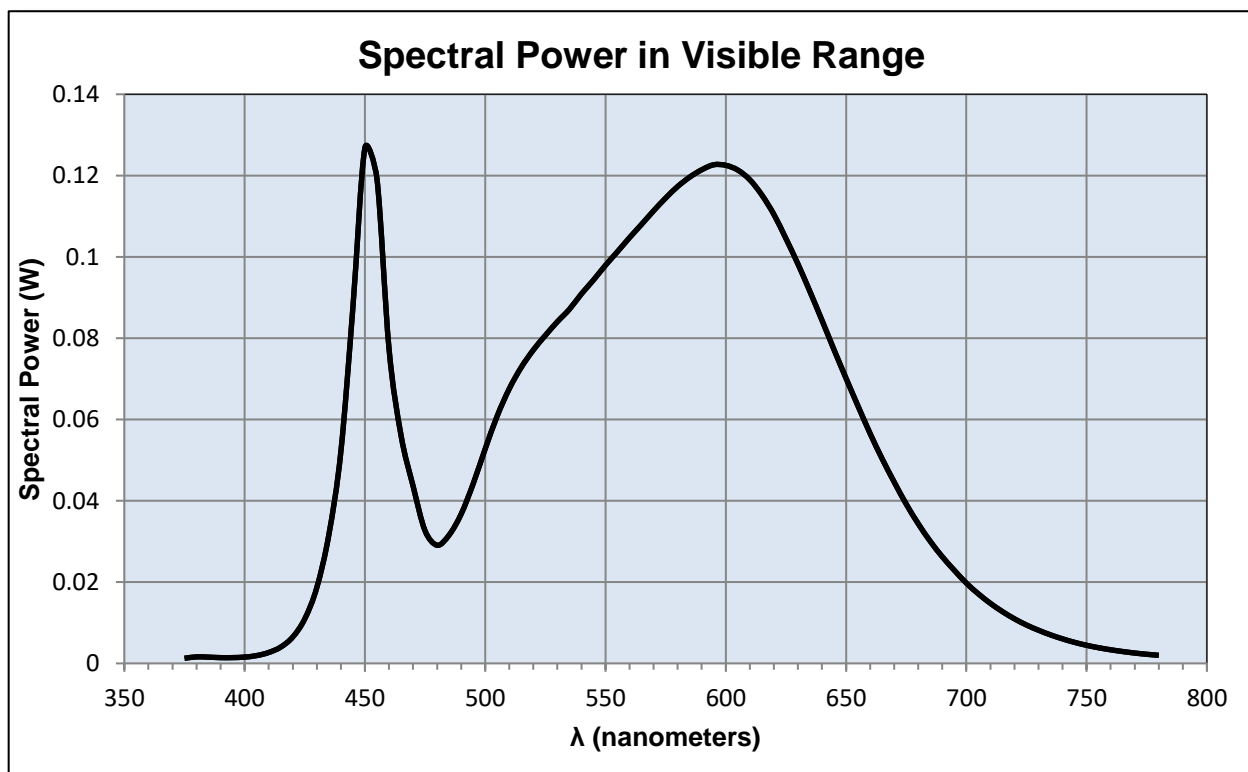
Ambient Temperature:  $25 \pm 1$  (°C)

### Electrical Measurements:

Input Voltage: 120 (VAC)  
Input Current: 0.498 (A)  
Input Power: 59.2 (W)  
Input Power Factor: 0.991  
Current ATHD: 11.94 (%)

### Photometric measurements:

Luminous Flux: 7009 (lumens)  
Luminous Efficacy: 118.4 (lumens/W)  
Correlated Color Temperature (CCT): 3772 (K)  
CRI -Ra: 83.5  
CRI -R9: 16.7  
DUV: 0.00057  
CIE Coordinate (x): 0.391  
CIE Coordinate (y): 0.382  
CIE Coordinate (u'): 0.23  
CIE Coordinate (v'): 0.337



## 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	0.073	655	0.063
380	0.002	520	0.077	660	0.057
385	0.002	525	0.081	665	0.050
390	0.001	530	0.084	670	0.045
395	0.001	535	0.087	675	0.039
400	0.002	540	0.091	680	0.034
405	0.002	545	0.094	685	0.030
410	0.003	550	0.098	690	0.026
415	0.004	555	0.101	695	0.023
420	0.007	560	0.105	700	0.020
425	0.011	565	0.108	705	0.017
430	0.019	570	0.111	710	0.015
435	0.032	575	0.114	715	0.013
440	0.052	580	0.117	720	0.011
445	0.088	585	0.120	725	0.009
450	0.127	590	0.121	730	0.008
455	0.119	595	0.123	735	0.007
460	0.078	600	0.123	740	0.006
465	0.056	605	0.121	745	0.005
470	0.044	610	0.119	750	0.004
475	0.033	615	0.115	755	0.004
480	0.029	620	0.110	760	0.003
485	0.032	625	0.105	765	0.003
490	0.037	630	0.098	770	0.003
495	0.044	635	0.091	775	0.002
500	0.053	640	0.084	780	0.002
505	0.061	645	0.077		
510	0.068	650	0.070		

## Test Results: Goniometer

Results include unit flux, distribution, efficacy, and electrical power for sample number L18015.  
Dialight unit model number LPx3N4H2W

### Electrical Measurements:

Input Voltage: 120 (VAC)  
Input current: 0.504 (A)  
Input Power: 59.3 (W)  
Power Factor: 0.981

### Photometric measurements:

Absolute Luminous Flux: 6913 (lumens)  
Luminous Efficacy: 116.7 (lumens/W)

### Intensity Summary:

<u>INTENSITY (CANDLEPOWER) SUMMARY</u>						
ANGLE	ALONG	23	45	67.5	ACROSS	OUTPUT LUMENS
0	3520	3520	3520	3520	3520	
5	3495	3495	3495	3495	3495	131
15	3278	3278	3278	3278	3278	719
25	2783	2783	2783	2783	2783	1180
35	2062	2062	2062	2062	2062	1321
45	1399	1399	1399	1399	1399	1170
55	980	980	980	980	980	953
65	689	689	689	689	689	761
75	368	368	368	368	368	511
85	34	34	34	34	34	165
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

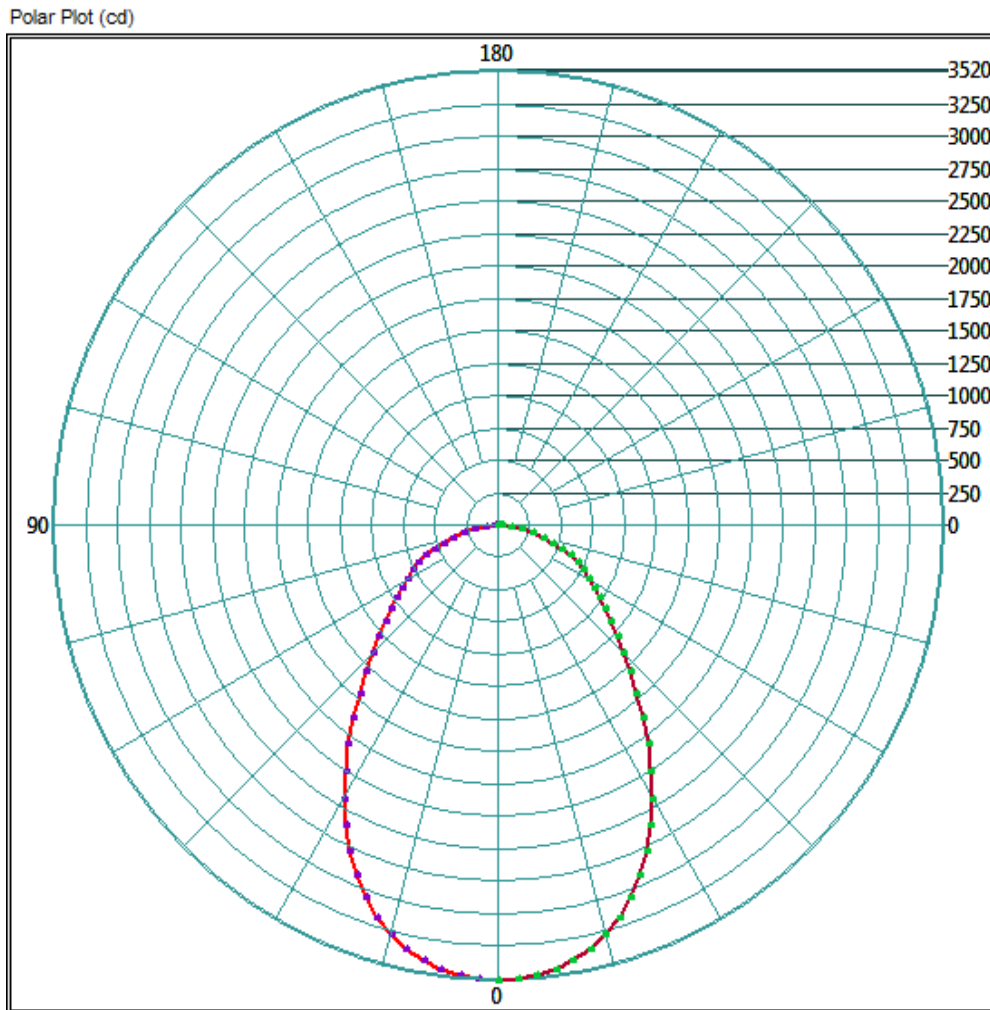
### ZONAL LUMEN AND PERCENTAGES

ZONE	LUMENS	% LUMINAIRE
0-30	2695.04	39.0%
0-40	3963.68	57.3%
0-60	5879.04	85.0%
60-90	1230.56	17.8%
0-90	6912.64	100.0%
90-180	0	0.0%
0-180	6912.64	100.0%

## Test Results: Goniometer

Results continued from previous page.

### Polar Plot:

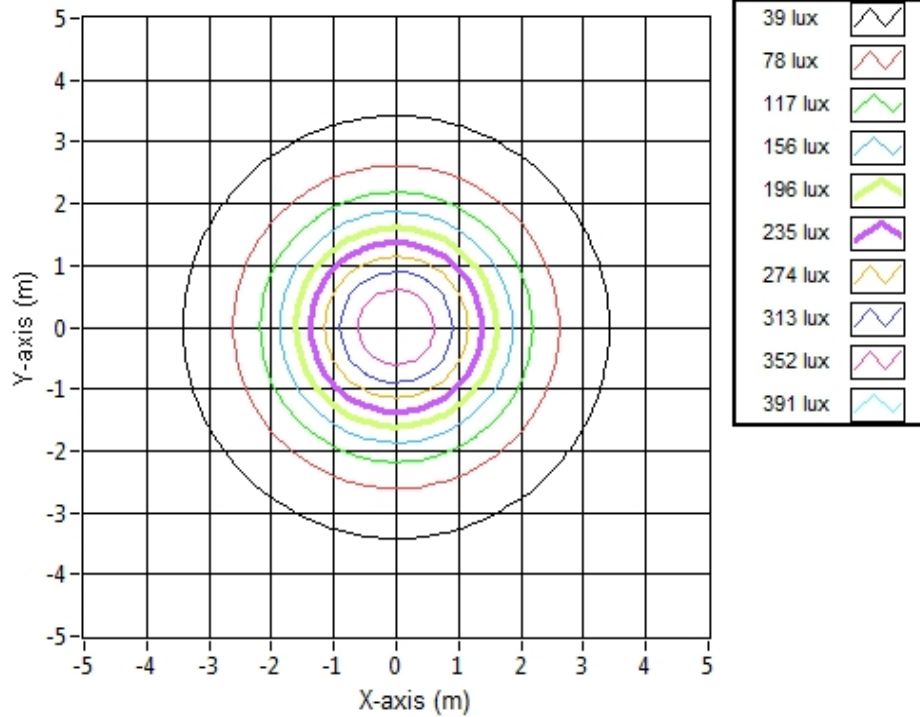


## Test Results: Goniometer

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	4.97	4.97	378.8
6.096	9.94	9.94	94.7
9.144	14.90	14.90	42.1
12.192	19.87	19.87	23.7
15.24	24.84	24.84	15.2
18.288	29.81	29.81	10.5
21.336	34.77	34.77	7.7
24.384	39.74	39.74	5.9
27.432	44.71	44.71	4.7
30.48	49.68	49.68	3.8

## Test Results: In Situ Temperature Measurement Test

Results include maximum LED chip temperature for sample number L18015.  
Dialight unit model number LPx3N4H2W

LED identified as Nichia part number NFSL757GT-V1.

LED drive current (as indicated by customer): 69 (mA)

### LED Specifications:

LED specifications are taken from LED manufacturer datasheet:

Maximum Forward Current (If): 180 (mA)  
Maximum Rated Power Dissipation: 0.558 (W)  
Maximum Junction Temp. (Tj): 120 (°C)  
Thermal Resistance (Rth): 19 (°C/W)

### Derived Specifications:

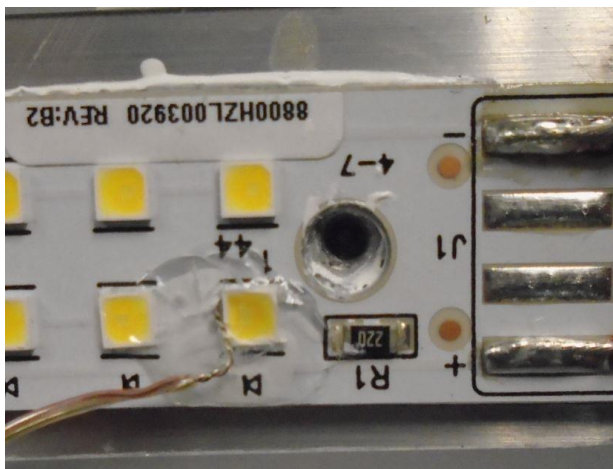
Maximum Power at Indicated Current: 0.214 (W)  
Maximum Source Temperature: 115.9 (°C)

### Test Conditions:

Temperature Measurement Location: See Photographs Below  
Ambient Temperature:  $25^{\circ} \pm 5^{\circ}$  (°C)  
Ambient temperature at time of measurement: 24.2 (°C)  
Relative humidity at time of measurement: 22%

### Results:

Measured LED source temperature: 49 (°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.

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