Test Report

Report Number: L18016 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: LPx3B4M2P

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: May 1, 2018 through June 11, 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

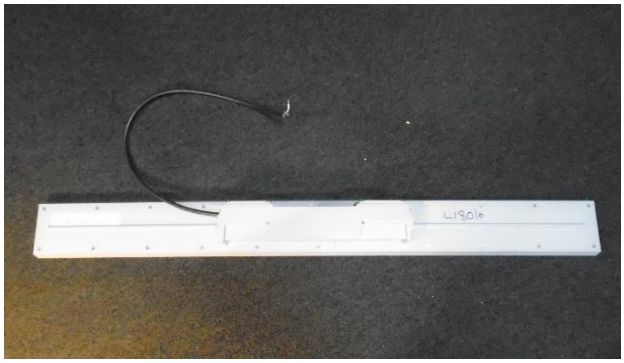
Description of sample:

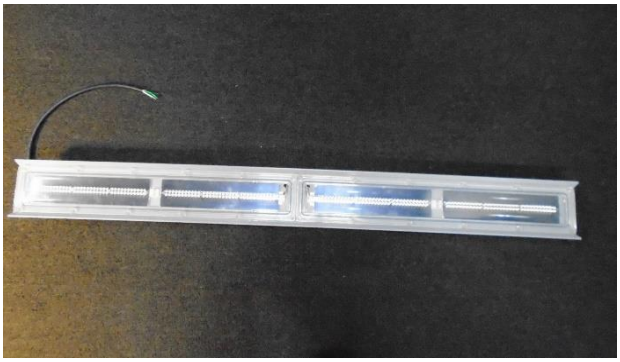
Sample Number:	L18016
Manufacturer:	Dialight Corporation
Product Name:	4' Linear LP
Description:	4' Linear LP
Model Number:	LPx3B4M2P

Report Summary

Sample number L18016
Dialight unit model number LPx3B4M2P

Photograph(s) of sample:





*Photographs not to scale. For reference only.

Summary of Results:

	Integrating Sphere		Goniophotometer	
Luminous Flux:	7922	(lumens)	7905	(lumens)
Electrical Power:	59.5	(W)	59.6	(W)
Luminous Efficacy:	133.3	(lumens/W)	132.7	(lumens/W)

Electrical Measurements:

Input Power (120VAC):	59.5	(W)
Power Factor (120VAC):	0.992	
Current ATHD % (120VAC):	11.54	
Input Power (277VAC):	59.3	(W)
Power Factor (277VAC):	0.951	
Current ATHD % (277VAC):	16.38	

Color Measurements:

Correlated Color Temperature (CCT):	5113
Color Rendering Index (CRI):	84.3
Chromaticity Coordinate (x):	0.342
Chromaticity Coordinate (y):	0.348
Chromaticity Coordinate (u'):	0.211
Chromaticity Coordinate (v'):	0.322
DUV:	0.00053

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 L18016.
Dialight unit model number LPx3B4M2P

Test Conditions:

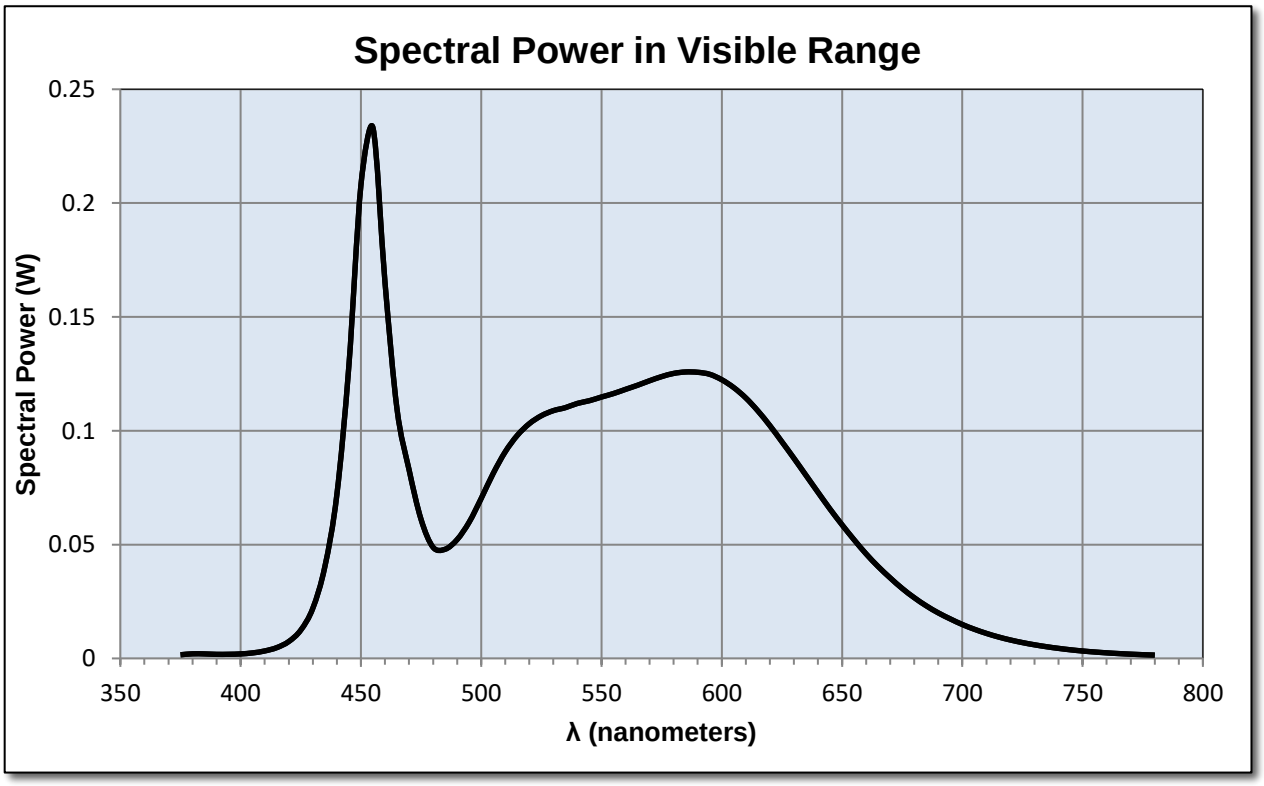
Ambient Temperature:	25 ± 1	(°C)

Electrical Measurements:

Input Voltage:	120	(VAC)
Input Current:	0.499	(A)
Input Power:	59.5	(W)
Input Power Factor:	0.992	
Current ATHD:	11.54	(%)

Photometric measurements:

Luminous Flux:	7922	(lumens)
Luminous Efficacy:	133.3	(lumens/W)
Correlated Color Temperature (CCT):	5113	(K)
CRI -Ra:	84.3	
CRI -R9:	14.1	
DUV:	0.00053	
CIE Coordinate (x):	0.342	
CIE Coordinate (y):	0.348	
CIE Coordinate (u'):	0.211	
CIE Coordinate (v'):	0.322	



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	0.098	655	0.052
380	0.002	520	0.103	660	0.046
385	0.002	525	0.107	665	0.040
390	0.002	530	0.109	670	0.035
395	0.002	535	0.110	675	0.031
400	0.002	540	0.112	680	0.027
405	0.002	545	0.113	685	0.023
410	0.003	550	0.115	690	0.020
415	0.005	555	0.116	695	0.017
420	0.007	560	0.118	700	0.015
425	0.012	565	0.120	705	0.013
430	0.022	570	0.122	710	0.011
435	0.040	575	0.124	715	0.009
440	0.072	580	0.125	720	0.008
445	0.129	585	0.126	725	0.007
450	0.208	590	0.126	730	0.006
455	0.233	595	0.125	735	0.005
460	0.165	600	0.122	740	0.004
465	0.110	605	0.119	745	0.004
470	0.083	610	0.114	750	0.003
475	0.061	615	0.109	755	0.003
480	0.049	620	0.102	760	0.002
485	0.048	625	0.095	765	0.002
490	0.052	630	0.088	770	0.002
495	0.060	635	0.080	775	0.002
500	0.070	640	0.073	780	0.001
505	0.081	645	0.066		
510	0.091	650	0.059		

Dialight OPTICS LABORATORY

NVLAP TESTING NVLAP LAB CODE 201033-0

Test Results: Goniometer

Results include unit flux, distribution, efficacy, and electrical power for sample number L18016.
Dialight unit model number LPx3B4M2P

Electrical Measurements:

Input Voltage:	120	(VAC)
Input current:	0.504	(A)
Input Power:	59.6	(W)
Power Factor:	0.983	

Photometric measurements:

Absolute Luminous Flux:	7905	(lumens)
Luminous Efficacy:	132.7	(lumens/W)

Intensity Summary:

INTENSITY (CANDLEPOWER) SUMMARY

ANGLE	ALONG	23	45	67.5	ACROSS	OUTPUT LUMENS
0	3682	3682	3682	3682	3682	
5	3705	3705	3705	3705	3705	138
15	3614	3614	3614	3614	3614	782
25	3377	3377	3377	3377	3377	1370
35	3117	3117	3117	3117	3117	1840
45	2196	2196	2196	2196	2196	1845
55	1215	1215	1215	1215	1215	1350
65	195	195	195	195	195	492
75	43	43	43	43	43	67
85	8	8	8	8	8	20
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

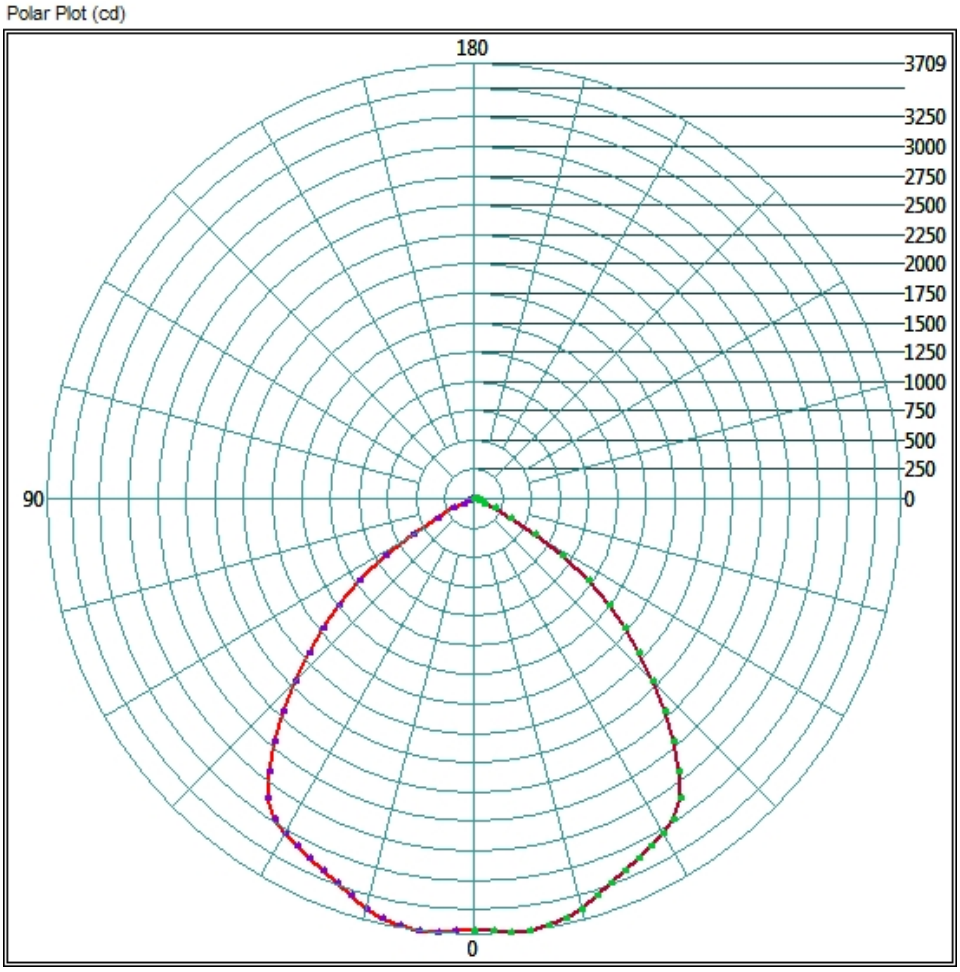
ZONAL LUMEN AND PERCENTAGES

ZONE	LUMENS	% LUMINAIRE
0-30	3164.16	40.0%
0-40	5095.68	64.5%
0-60	7680.8	97.2%
60-90	368.8	4.7%
0-90	7905.28	100.0%
90-180	0	0.0%
0-180	7905.28	100.0%

Test Results: Goniometer

Results continued from previous page.

Polar Plot:



Test Results: Goniometer

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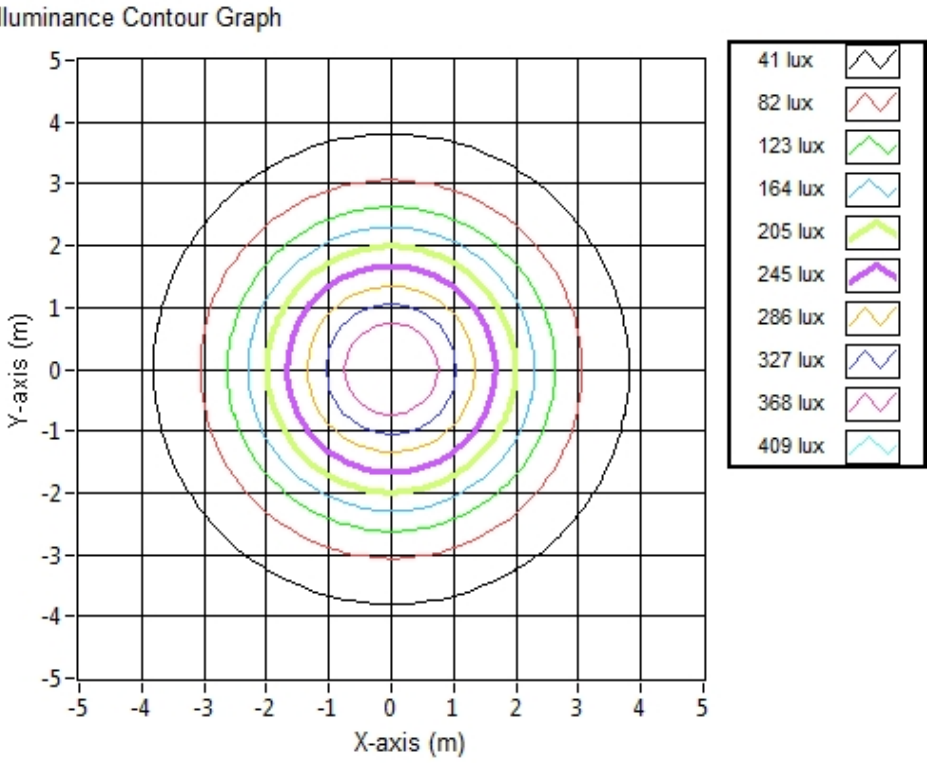
Illuminance Plot:



Illuminance-Cone of Light:

Mounting Height (m)	Beam Cone Width (m)	Orthogonal Beam Cone Width (m)	Projected Illuminance (lux)
3.048	6.94	6.94	396.3
6.096	13.87	13.87	99.1
9.144	20.81	20.81	44.0
12.192	27.74	27.74	24.8
15.24	34.68	34.68	15.9
18.288	41.62	41.62	11.0
21.336	48.55	48.55	8.1
24.384	55.49	55.49	6.2
27.432	62.43	62.43	4.9
30.48	69.36	69.36	4.0

Test Results: In Situ Temperature Measurement Test

Results include maximum LED chip temperature for sample number L18016.
Dialight unit model number LPx3B4M2P

LED identified as Nichia part number NFSW757GT-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:

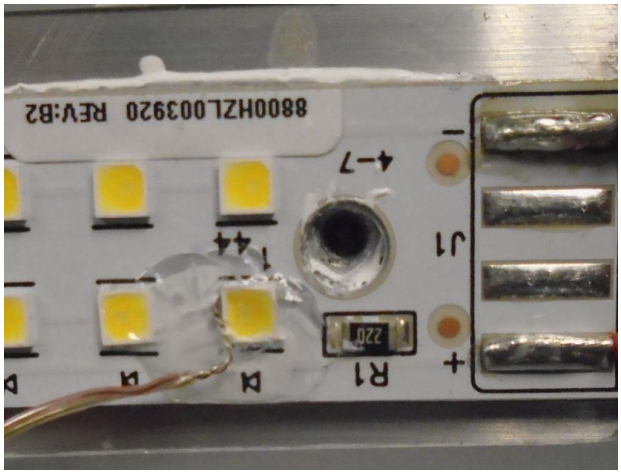
Maximum Power at Indicated Current:	0.214	(W)
Maximum Source Temperature:	115.9	(°C)

Test Conditions:

Temperature Measurement Location:	See Photographs Below	
Ambient Temperature:	25° ± 5‘	(°C)
Ambient temperature at time of measurement:	24.2	(°C)
Relative humidity at time of measurement:	20%	

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 Precison	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.

Test Report Issued By:

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Senior Optical Engineering Technician
Lighting Division

Test Report Reviewed and Approved By:

Vishnu Shastry
Dialight Optics Laboratory
Optical Engineer
Approved Signatory