Dialight OPTICS LABORATORY

NVLAP Lab Code 201033-0

Test Report

Report Number: L16025 Date: Apr 1, 2016

Issued by:
Dialight Optics Laboratory
1501 Route 34 South, Farmingdale, NJ 07727

Test of one 4ft End-to-End Linear With Clear Lens
Unit manufacturer: Dialight Corporation
Unit model number: LBx2MB3FNxxxxN

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: 4/1/20016 through April 1, 2016

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:	L16025
Manufacturer:	Dialight Corporation
Product Name:	4ft End-to-End Linear
Description:	4ft End-to-End Linear With Clear Lens
Model Number:	LBx2MB3FNxxxxN

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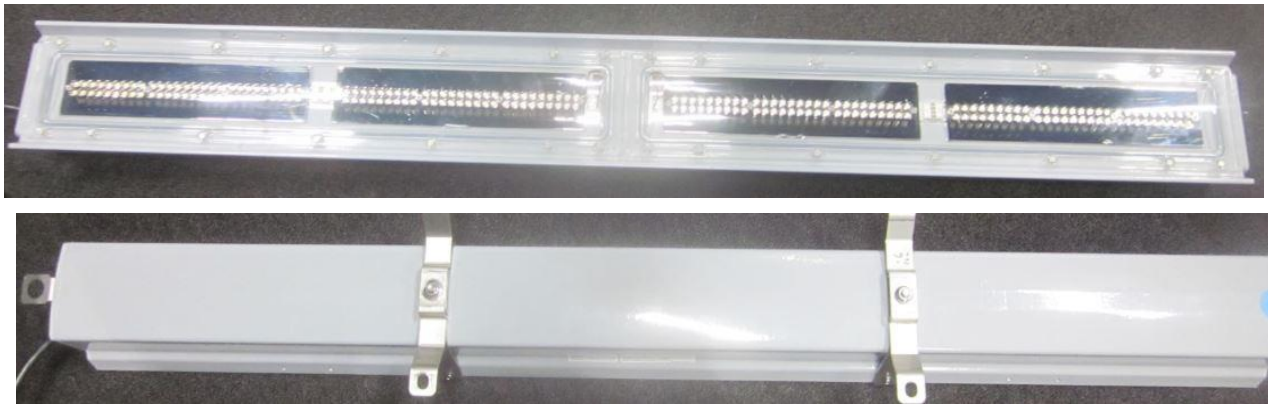
Report Summary

Sample number L16025

Dialight unit model number LBx2MB3FNxxxxN

Photograph(s) of sample:



*Photographs not to scale. For reference only.

Summary of Results:

	Integrating Sphere		Goniophotometer	
Luminous Flux:	8006	(lumens)	7934	(lumens)
Electrical Power:	62.1	(W)	61.9	(W)
Luminous Efficacy:	129.1	(lumens/W)	128.1	(lumens/W)

Electrical Measurements:

Input Power (120VAC):	62.1	(W)
Power Factor (120VAC):	0.992	
Current ATHD % (120VAC):	11.6	
Input Power (277VAC):	60.5	(W)
Power Factor (277VAC):	0.96	
Current ATHD % (277VAC):	14.51	

Color Measurements:

Correlated Color Temperature (CCT):	4794
Color Rendering Index (CRI):	84.7
Chromaticity Coordinate (x):	0.352
Chromaticity Coordinate (y):	0.361
Chromaticity Coordinate (u'):	0.212
Chromaticity Coordinate (v'):	0.327
DUV:	0.0019

Temperature Measurements:

In Situ LED Source Temperature:	47.6	(°C)

Test Results: Integrating Sphere

Results include unit color, flux, efficacy and electrical power for sample number L16025.
Dialight unit model number LBx2MB3FNxxxxN

Test Conditions:

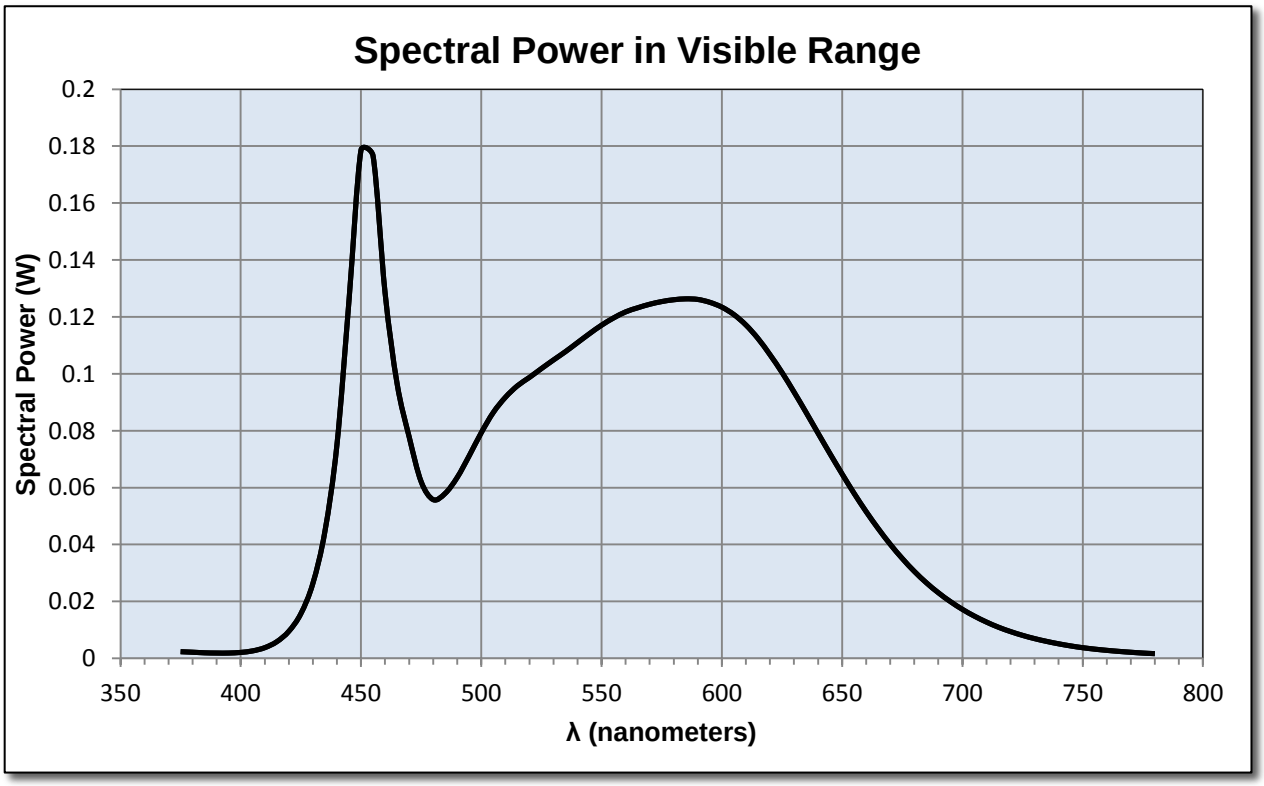
Ambient Temperature:	25 ± 1	(°C)

Electrical Measurements:

Input Voltage:	120	(VAC)
Input Current:	0.52	(A)
Input Power:	62.1	(W)
Input Power Factor:	0.992	
Current ATHD:	11.6	(%)

Photometric measurements:

Luminous Flux:	8006	(lumens)
Luminous Efficacy:	129.1	(lumens/W)
Correlated Color Temperature (CCT):	4794	(K)
CRI -Ra:	84.7	
CRI -R9:	17.6	
DUV:	0.0019	
CIE Coordinate (x):	0.352	
CIE Coordinate (y):	0.361	
CIE Coordinate (u'):	0.212	
CIE Coordinate (v'):	0.327	



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	0.096	655	0.058
380	0.002	520	0.099	660	0.052
385	0.002	525	0.102	665	0.046
390	0.002	530	0.105	670	0.040
395	0.002	535	0.108	675	0.035
400	0.002	540	0.111	680	0.031
405	0.003	545	0.114	685	0.027
410	0.004	550	0.117	690	0.023
415	0.006	555	0.120	695	0.020
420	0.010	560	0.122	700	0.017
425	0.016	565	0.123	705	0.015
430	0.026	570	0.124	710	0.013
435	0.045	575	0.125	715	0.011
440	0.075	580	0.126	720	0.009
445	0.126	585	0.126	725	0.008
450	0.179	590	0.126	730	0.007
455	0.177	595	0.125	735	0.006
460	0.129	600	0.123	740	0.005
465	0.097	605	0.121	745	0.004
470	0.078	610	0.117	750	0.004
475	0.062	615	0.112	755	0.003
480	0.056	620	0.107	760	0.003
485	0.058	625	0.100	765	0.002
490	0.064	630	0.094	770	0.002
495	0.071	635	0.086	775	0.002
500	0.079	640	0.079	780	0.002
505	0.086	645	0.072		
510	0.092	650	0.065		

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Test Results: Goniometer

Results include unit flux, distribution, efficacy, and electrical power for sample number L16025.
Dialight unit model number LBx2MB3FNxxxxN

Electrical Measurements:

Input Voltage:	120	(VAC)
Input current:	0.52	(A)
Input Power:	61.9	(W)
Power Factor:	0.986	

Photometric measurements:

Absolute Luminous Flux:	7934	(lumens)
Luminous Efficacy:	128.1	(lumens/W)

Intensity Summary:

INTENSITY (CANDLEPOWER) SUMMARY

ANGLE	ALONG	23	45	68	ACROSS	OUTPUT LUMENS
0	3229	3229	3229	3229	3229	
5	3269	3269	3269	3269	3269	122
15	3295	3295	3295	3295	3295	707
25	3178	3178	3178	3178	3178	1273
35	2785	2785	2785	2785	2785	1701
45	1975	1975	1975	1975	1975	1621
55	1469	1469	1469	1469	1469	1414
65	607	607	607	607	607	942
75	30	30	30	30	30	140
85	5	5	5	5	5	13
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	

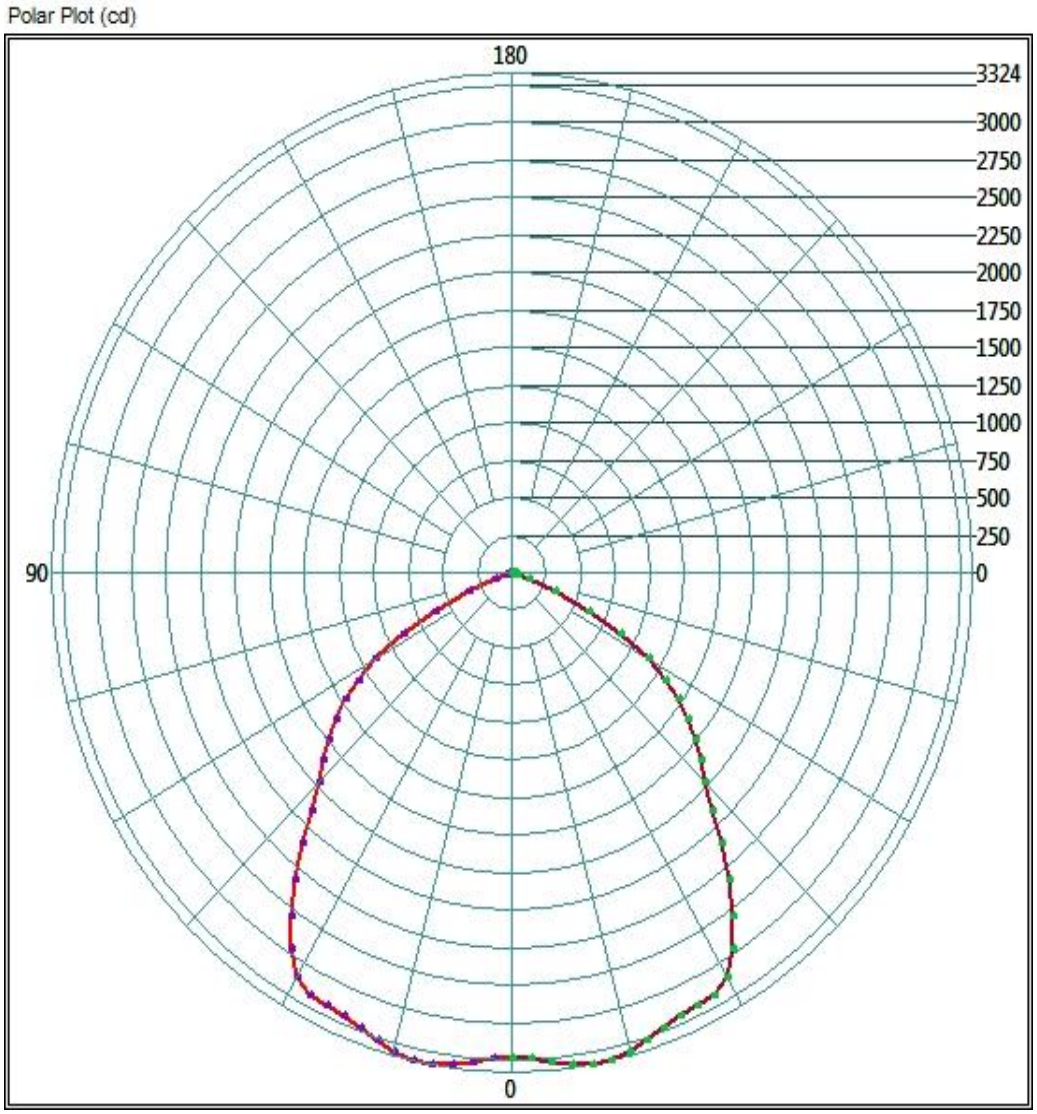
ZONAL LUMEN AND PERCENTAGES

ZONE	LUMENS	% LUMINAIRE
0-30	2927.04	36.9%
0-40	4643.68	58.5%
0-60	7412.16	93.4%
60-90	790.88	10.0%
0-90	7933.6	100.0%
90-180	0	0.0%
0-180	7933.6	100.0%

Test Results: Goniometer

Results continued from previous page.

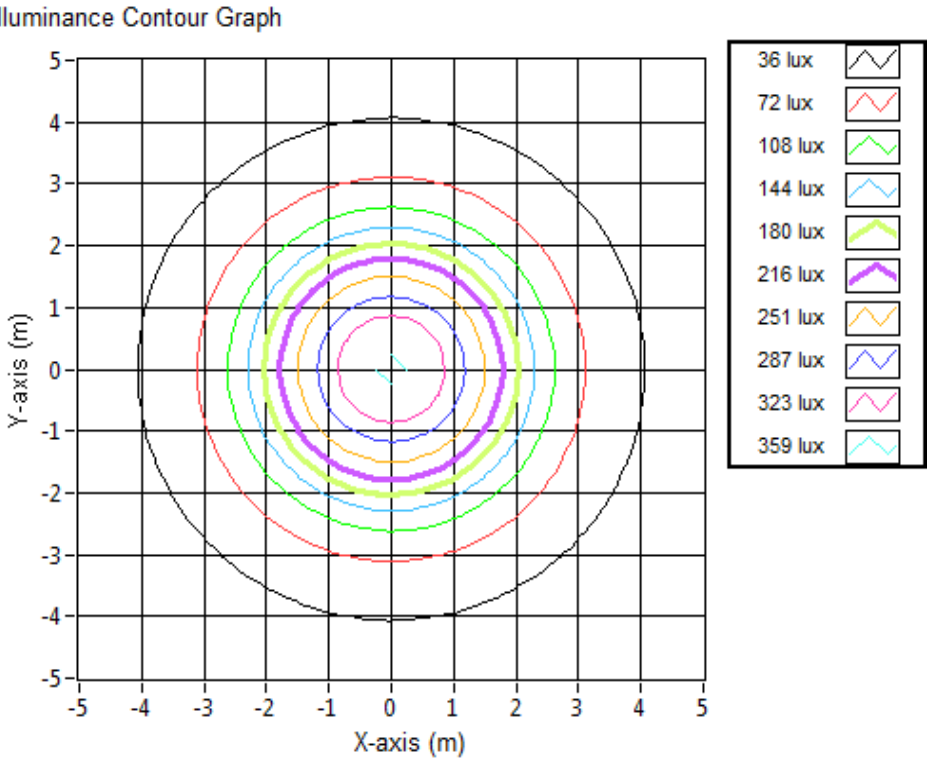
Polar Plot:



Test Results: Goniometer

Results continued from previous page.

Illuminance Plot:



Illuminance-Cone of Light:

Mounting Height (m)	Beam Cone Width (m)	Orthogonal Beam Cone Width (m)	Projected Illuminance (lux)
3.048	7.86	7.86	347.6
6.096	15.73	15.73	86.9
9.144	23.59	23.59	38.6
12.192	31.45	31.45	21.7
15.24	39.31	39.31	13.9
18.288	47.18	47.18	9.7
21.336	55.04	55.04	7.1
24.384	62.90	62.90	5.4
27.432	70.76	70.76	4.3
30.48	51.59	51.59	8.1

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Test Results: In Situ Temperature Measurement Test

Results include maximum LED chip temperature for sample number L16025.
Dialight unit model number LBx2MB3FNxxxxN

LED identified as Seoul part number STW8C2SA.

LED drive current (as indicated by customer):	45	(mA)

LED Specifications:

LED specifications are taken from LED manufacturer datasheet:

Maximum Forward Current (If):	200	(mA)
Maximum Rated Power Dissipation:	1.44	(W)
Maximum Junction Temp. (Tj):	125	(°C)
Thermal Resistance (Rth):	10	(°C/W)

Derived Specifications:

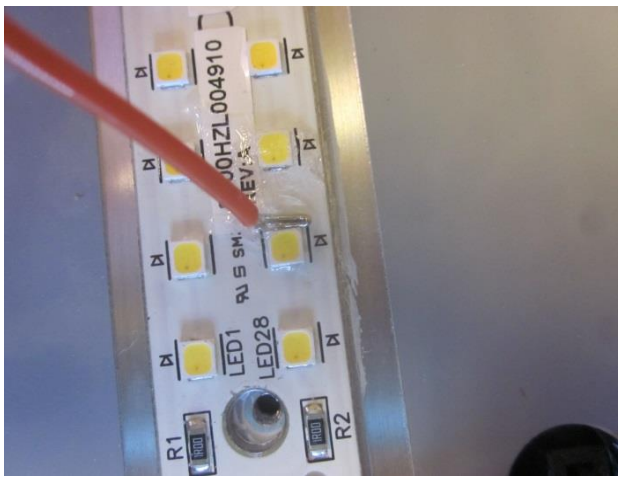
Maximum Power at Indicated Current:	0.324	(W)
Maximum Source Temperature:	121.8	(°C)

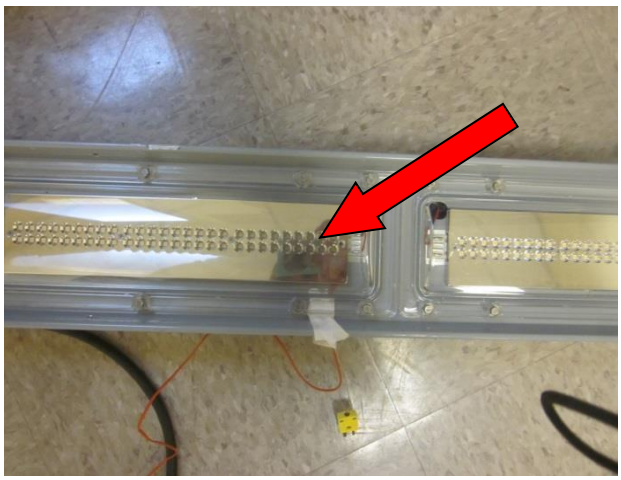
Test Conditions:

Temperature Measurement Location:	See Photographs Below	
Ambient Temperature:	25° ± 5‘	(°C)
Ambient temperature at time of measurement:	23.9	(°C)
Relative humidity at time of measurement:	44%	

Results:

Measured LED source temperature:	47.6	(°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
Volttech Power Analyzer	PM1000+
Delta Elektronika DC Power Supply	SM.300-5
Elgar AC Power Supply	CW1251P
Instek AC Power Supply	APS-9501
Sorensen DC Power Supply	XHR150-7
Extech Hygro-Thermometer	4/16/3120
Extech Hygro-Thermometer	4/16/3120
Fluke 52II Thermometer	52II Thermometer
Volttech Power Analyzer	PM1000+
BK Precison	1715A
TDK-Lambda	GEN1500W
Fluke 8808A Digit Multimeter	8808A
TPI Digitial Thermometer 343	TPI 343
TPI Digitial Thermometer 343	TPI 343
Step-Up Transformer	
Omega TC	Dpi8-C24
Agilent True RMS OLED Multimeter	U1273A
Adaptive Power Systems AC Power Supply	FC-210
Xitron Power Analyzer	XT2640

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:

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