

Test Report

Report Number: L16024

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 Diffused Lens

Unit manufacturer: Dialight Corporation

Unit model number: LBx6MB3FNxxxxN

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: April 1, 2016 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: L16024

Manufacturer: Dialight Corporation

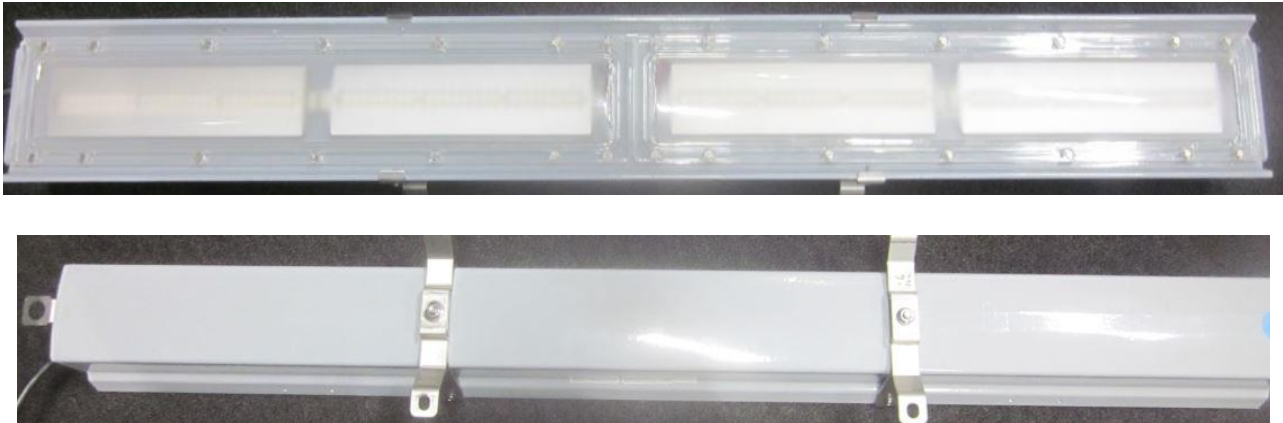
Product Name: 4ft End-to-End Linear

Description: 4ft End-to-End Linear With Diffused Lens

Model Number: LBx6MB3FNxxxxN

Report Summary
Sample number L16024
Dialight unit model number LBx6MB3FNxxxxN

Photograph(s) of sample:



*Photographs not to scale. For reference only.

Summary of Results:

	<u>Integrating Sphere</u>	<u>Goniophotometer</u>
Luminous Flux:	6902 (lumens)	6799 (lumens)
Electrical Power:	62.1 (W)	62.0 (W)
Luminous Efficacy:	111 (lumens/W)	109.7 (lumens/W)

Electrical Measurements:

Input Power (120VAC): 62.1 (W)
 Power Factor (120VAC): 0.993
 Current ATHD % (120VAC): 10.96
 Input Power (277VAC): 60.6 (W)
 Power Factor (277VAC): 0.948
 Current ATHD % (277VAC): 14.75

Color Measurements:

Correlated Color Temperature (CCT): 4738
 Color Rendering Index (CRI): 84.8
 Chromaticity Coordinate (x): 0.354
 Chromaticity Coordinate (y): 0.362
 Chromaticity Coordinate (u'): 0.213
 Chromaticity Coordinate (v'): 0.327
 DUV: 0.0019

Temperature Measurements:

In Situ LED Source Temperature: 47.3 (°C)

Test Results: Integrating Sphere

Results include unit color, flux, efficacy and electrical power for sample number L16024.
Dialight unit model number LBx6MB3FNxxxxN

Test Conditions:

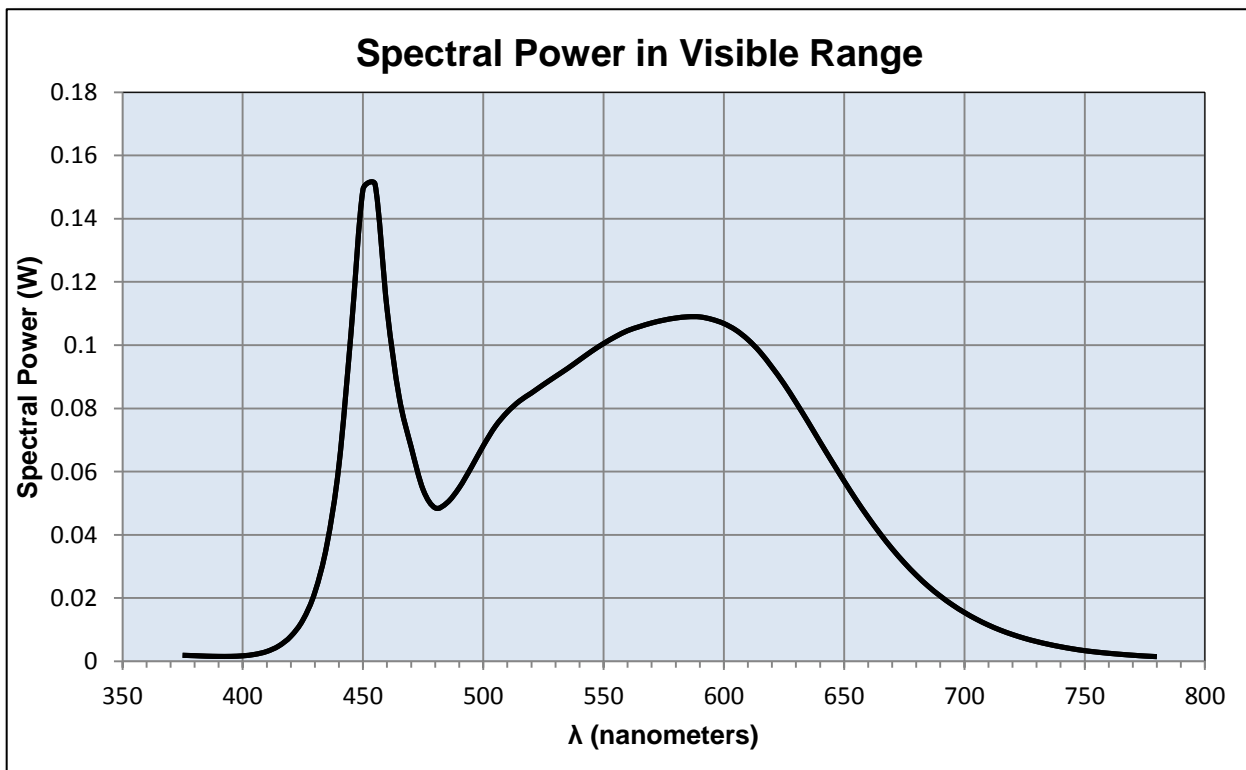
Ambient Temperature: 25 ± 1 (°C)

Electrical Measurements:

Input Voltage: 120 (VAC)
Input Current: 0.52 (A)
Input Power: 62.1 (W)
Input Power Factor: 0.993
Current ATHD: 10.96 (%)

Photometric measurements:

Luminous Flux: 6902 (lumens)
Luminous Efficacy: 111.0 (lumens/W)
Correlated Color Temperature (CCT): 4738 (K)
CRI -Ra: 84.8
CRI -R9: 17.9
DUV: 0.0019
CIE Coordinate (x): 0.354
CIE Coordinate (y): 0.362
CIE Coordinate (u'): 0.213
CIE Coordinate (v'): 0.327



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	0.002	515	0.082	655	0.051
380	0.002	520	0.085	660	0.046
385	0.002	525	0.088	665	0.040
390	0.002	530	0.090	670	0.036
395	0.002	535	0.093	675	0.031
400	0.002	540	0.095	680	0.027
405	0.002	545	0.098	685	0.024
410	0.003	550	0.101	690	0.021
415	0.005	555	0.103	695	0.018
420	0.008	560	0.105	700	0.015
425	0.013	565	0.106	705	0.013
430	0.022	570	0.107	710	0.011
435	0.037	575	0.108	715	0.010
440	0.062	580	0.109	720	0.008
445	0.104	585	0.109	725	0.007
450	0.149	590	0.109	730	0.006
455	0.151	595	0.108	735	0.005
460	0.111	600	0.107	740	0.005
465	0.084	605	0.105	745	0.004
470	0.068	610	0.102	750	0.003
475	0.054	615	0.098	755	0.003
480	0.049	620	0.093	760	0.003
485	0.050	625	0.088	765	0.002
490	0.055	630	0.082	770	0.002
495	0.061	635	0.076	775	0.002
500	0.068	640	0.069	780	0.001
505	0.074	645	0.063		
510	0.079	650	0.057		

Test Results: Goniometer

Results include unit flux, distribution, efficacy, and electrical power for sample number L16024.
Dialight unit model number LBx6MB3FNxxxxN

Electrical Measurements:

Input Voltage: 120 (VAC)
Input current: 0.52 (A)
Input Power: 62.0 (W)
Power Factor: 0.987

Photometric measurements:

Absolute Luminous Flux: 6799 (lumens)
Luminous Efficacy: 109.7 (lumens/W)

Intensity Summary:

INTENSITY (CANDLEPOWER) SUMMARY						
ANGLE	ALONG	23	45	68	ACROSS	OUTPUT LUMENS
0	3569	3569	3569	3569	3569	
5	3544	3544	3544	3544	3544	132
15	3332	3332	3332	3332	3332	730
25	2865	2865	2865	2865	2865	1208
35	2147	2147	2147	2147	2147	1371
45	1416	1416	1416	1416	1416	1204
55	913	913	913	913	913	920
65	593	593	593	593	593	674
75	298	298	298	298	298	425
85	35	35	35	35	35	132
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

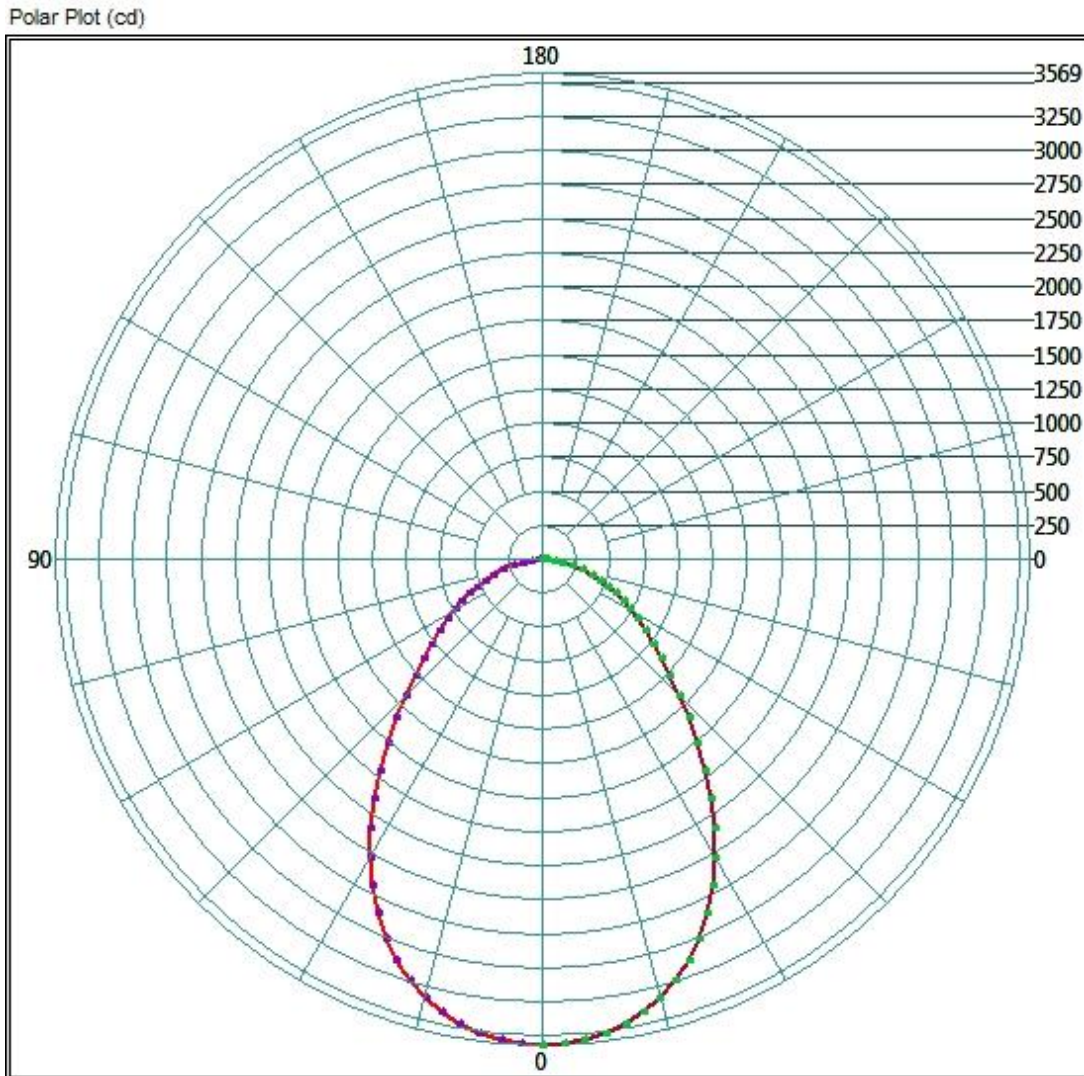
ZONAL LUMEN AND PERCENTAGES

ZONE	LUMENS	% LUMINAIRE
0-30	2759.2	40.6%
0-40	4077.76	60.0%
0-60	5930.4	87.2%
60-90	1044	15.4%
0-90	6798.88	100.0%
90-180	0	0.0%
0-180	6798.88	100.0%

Test Results: Goniometer

Results continued from previous page.

Polar Plot:

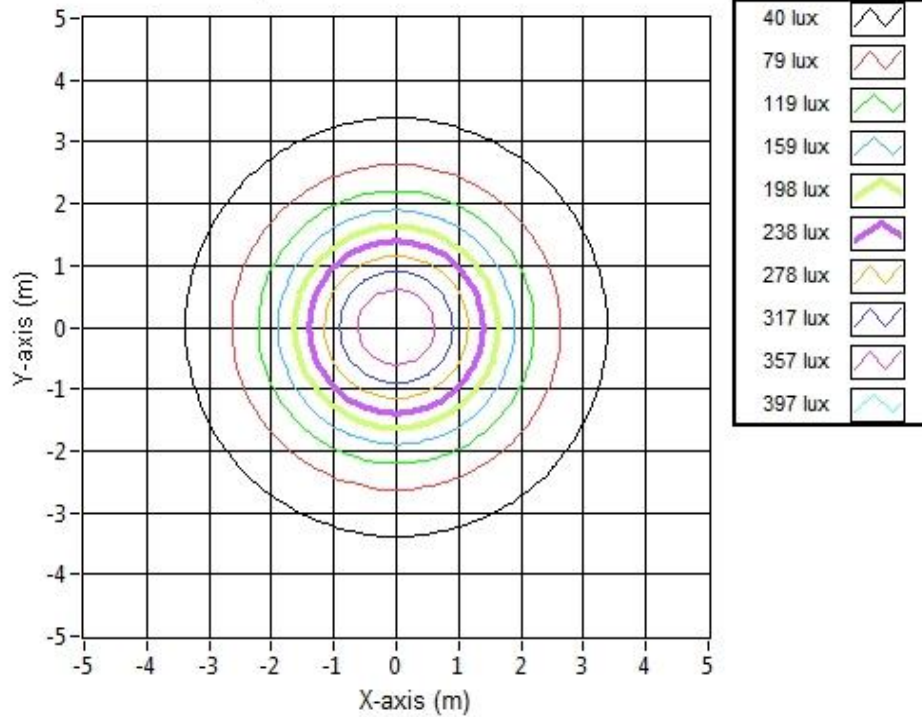


Test Results: Goniometer

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	5.06	5.06	384.2
6.096	10.12	10.12	96.0
9.144	15.18	15.18	42.7
12.192	20.24	20.24	24.0
15.24	25.31	25.31	15.4
18.288	30.37	30.37	10.7
21.336	35.43	35.43	7.8
24.384	40.49	40.49	6.0
27.432	45.55	45.55	4.7
30.48	50.61	50.61	3.8

Test Results: In Situ Temperature Measurement Test

Results include maximum LED chip temperature for sample number L16024.
Dialight unit model number LBx6MB3FNxxxxN

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:

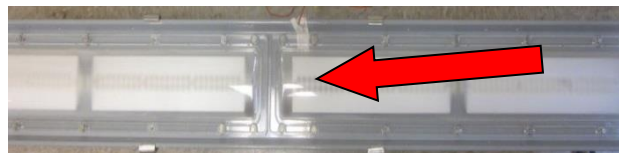
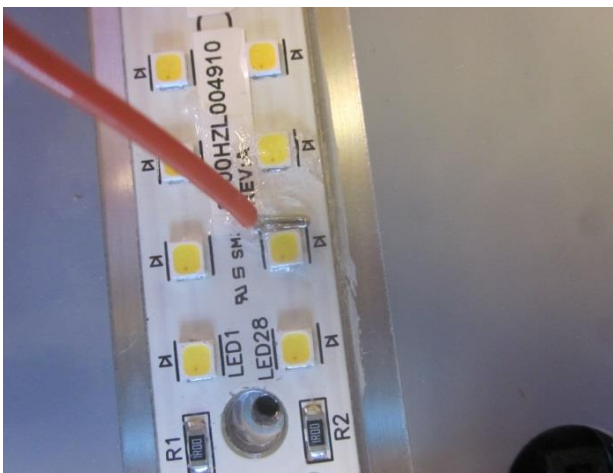
Maximum Power at Indicated Current: 0.324 (W)
Maximum Source Temperature: 121.8 (°C)

Test Conditions:

Temperature Measurement Location: See Photographs Below
Ambient Temperature: $25^{\circ} \pm 5^{\circ}$ (°C)
Ambient temperature at time of measurement: 24 (°C)
Relative humidity at time of measurement: 41%

Results:

Measured LED source temperature: 47.3 (°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
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 Precision	1715A
TDK-Lambda	GEN1500W
Fluke 8808A Digit Multimeter	8808A
TPI Digital 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. 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