

Test Report

Report Number: L19022

Date: Apr 9, 2019

Issued by:

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

Test of one High Bay

Unit manufacturer: Dialight Corporation
Unit model number: RRE-5MC2-Gxxx-xxN

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 8, 2019 through April 9, 2019

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: L19022
Manufacturer: Dialight Corporation
Product Name: Reliant High Bay
Description: High Bay
Model Number: RRE-5MC2-Gxxx-xxN

Report Summary

Sample number L19022
Dialight unit model number RRE-5MC2-Gxxx-xxN

Photograph(s) of sample:



*Photographs not to scale. For reference only.

Summary of Results:

	<u>Integrating Sphere</u>	<u>Goniophotometer</u>
Luminous Flux:	25400 (lumens)	25443 (lumens)
Electrical Power:	192.0 (W)	191.8 (W)
Luminous Efficacy:	132.3 (lumens/W)	132.7 (lumens/W)

Electrical Measurements:

Input Power (230VAC): 192.0 (W)
Power Factor (230VAC): 0.985
Current ATHD % (230VAC): 8.465
Input Power (110VAC): 199.4 (W)
Power Factor (110VAC): 0.996
Current ATHD % (110VAC): 4.407

Color Measurements:

Correlated Color Temperature (CCT): 5080
Color Rendering Index (CRI): 87.3
Chromaticity Coordinate (x): 0.343
Chromaticity Coordinate (y): 0.353
Chromaticity Coordinate (u'): 0.21
Chromaticity Coordinate (v'): 0.323
DUV: 0.0013

Temperature Measurements:

In Situ LED Source Temperature: 56.7 (°C)

Test Results: Integrating Sphere

Results include unit color, flux, efficacy and electrical power for sample number L19022.

Dialight unit model number RRE-5MC2-Gxxx-xxN

Test Conditions:

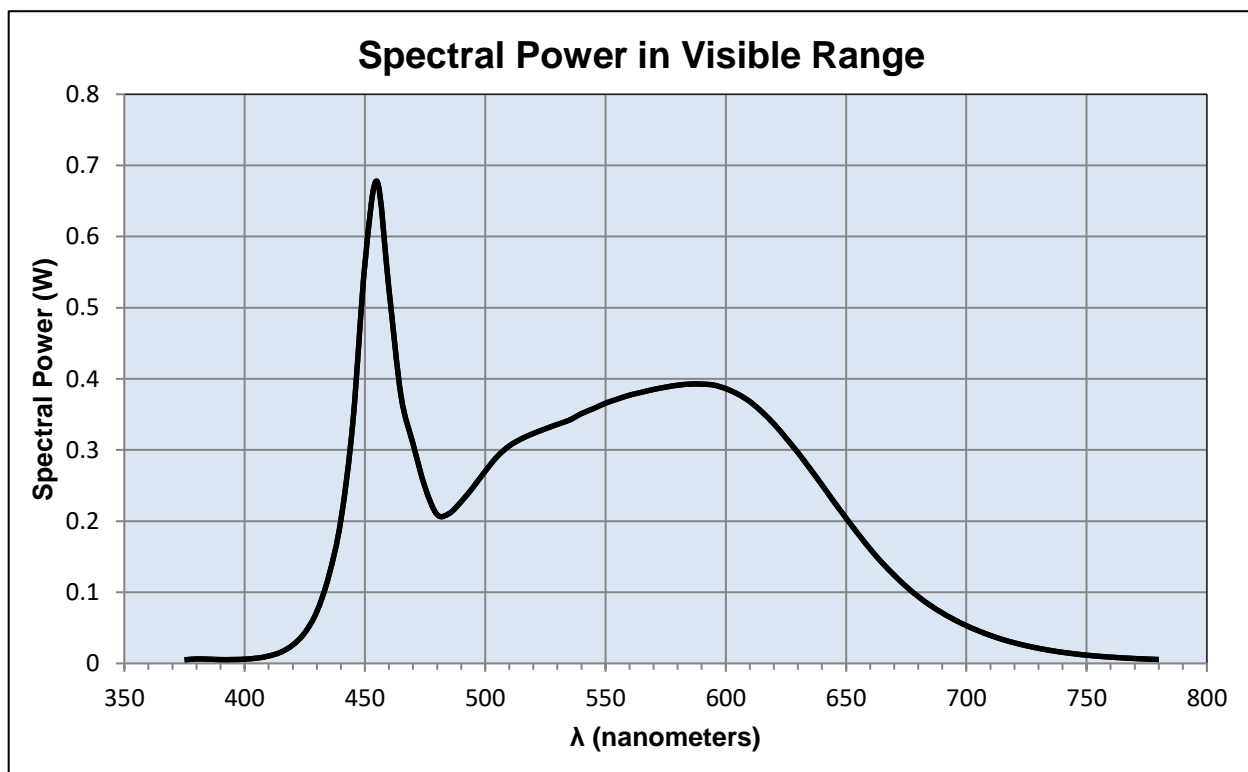
Ambient Temperature: 25 ± 1 (°C)

Electrical Measurements:

Input Voltage: 230 (VAC)
Input Current: 0.85 (A)
Input Power: 192.0 (W)
Input Power Factor: 0.985
Current ATHD: 8.465 (%)

Photometric measurements:

Luminous Flux: 25400 (lumens)
Luminous Efficacy: 132.3 (lumens/W)
Correlated Color Temperature (CCT): 5080 (K)
CRI -Ra: 87.3
CRI -R9: 27.1
DUV: 0.0013
CIE Coordinate (x): 0.343
CIE Coordinate (y): 0.353
CIE Coordinate (u'): 0.21
CIE Coordinate (v'): 0.323



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	0.005	515	0.316	655	0.182
380	0.006	520	0.323	660	0.161
385	0.006	525	0.330	665	0.141
390	0.005	530	0.336	670	0.124
395	0.005	535	0.342	675	0.108
400	0.006	540	0.351	680	0.094
405	0.007	545	0.358	685	0.082
410	0.010	550	0.366	690	0.071
415	0.016	555	0.372	695	0.061
420	0.026	560	0.377	700	0.053
425	0.043	565	0.381	705	0.046
430	0.073	570	0.385	710	0.039
435	0.123	575	0.388	715	0.034
440	0.201	580	0.391	720	0.029
445	0.339	585	0.393	725	0.025
450	0.561	590	0.393	730	0.021
455	0.678	595	0.391	735	0.018
460	0.525	600	0.386	740	0.016
465	0.376	605	0.379	745	0.013
470	0.309	610	0.368	750	0.012
475	0.248	615	0.354	755	0.010
480	0.209	620	0.337	760	0.009
485	0.211	625	0.317	765	0.008
490	0.227	630	0.296	770	0.007
495	0.248	635	0.274	775	0.006
500	0.270	640	0.251	780	0.005
505	0.291	645	0.227		
510	0.306	650	0.204		

Test Results: Goniometer

Results include unit flux, distribution, efficacy, and electrical power for sample number L19022.
Dialight unit model number RRE-5MC2-Gxxx-xxN

Electrical Measurements:

Input Voltage: 230 (VAC)
Input current: 0.845 (A)
Input Power: 191.8 (W)
Power Factor: 0.986

Photometric measurements:

Absolute Luminous Flux: 25443 (lumens)
Luminous Efficacy: 132.7 (lumens/W)

Intensity Summary:

<u>INTENSITY (CANDLEPOWER) SUMMARY</u>						
ANGLE	ALONG	23	45	67.5	ACROSS	OUTPUT LUMENS
0	10825	10825	10825	10825	10825	
5	10842	10842	10842	10842	10842	405
15	10980	10980	10980	10980	10980	2335
25	10969	10969	10969	10969	10969	4375
35	9626	9626	9626	9626	9626	5822
45	6558	6558	6558	6558	6558	5593
55	3332	3332	3332	3332	3332	3802
65	1356	1356	1356	1356	1356	1882
75	575	575	575	575	575	837
85	205	205	205	205	205	358
95	0	0	0	0	0	35
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

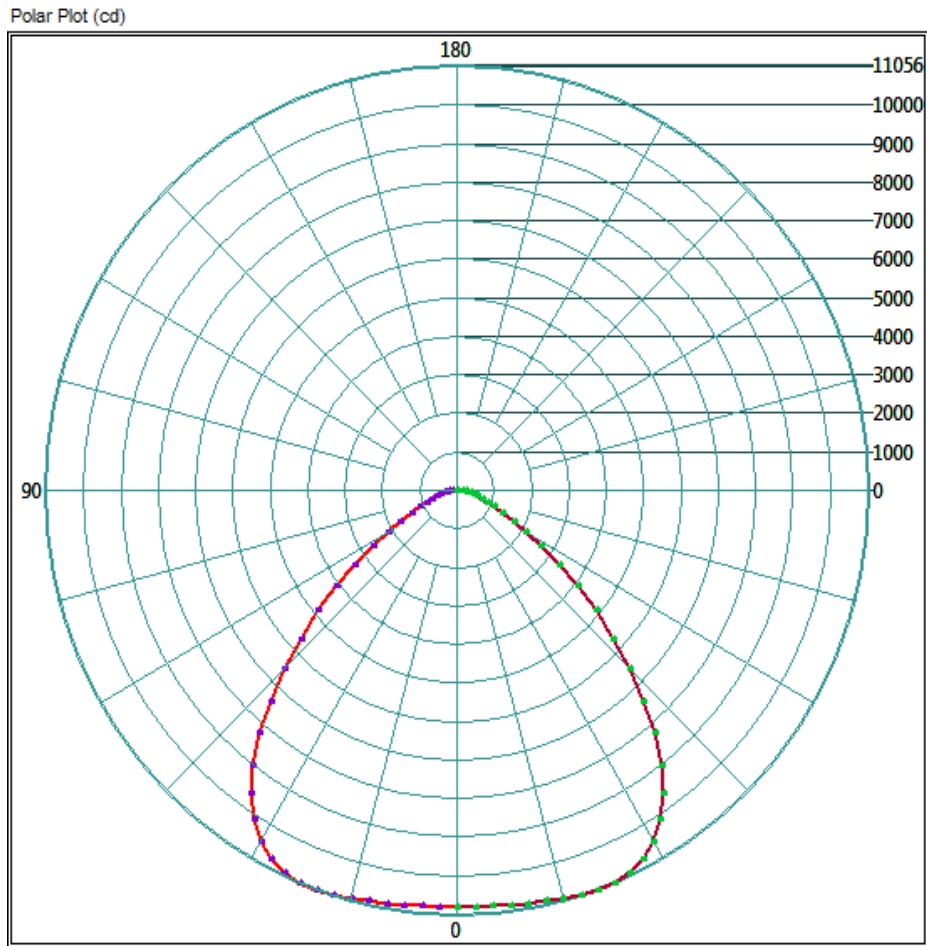
ZONAL LUMEN AND PERCENTAGES

ZONE	LUMENS	% LUMINAIRE
0-30	9927.84	39.0%
0-40	15885.44	62.4%
0-60	23462.24	92.2%
60-90	2490.24	9.8%
0-90	25443.2	100.0%
90-180	0	0.0%
0-180	25443.2	100.0%

Test Results: Goniometer

Results continued from previous page.

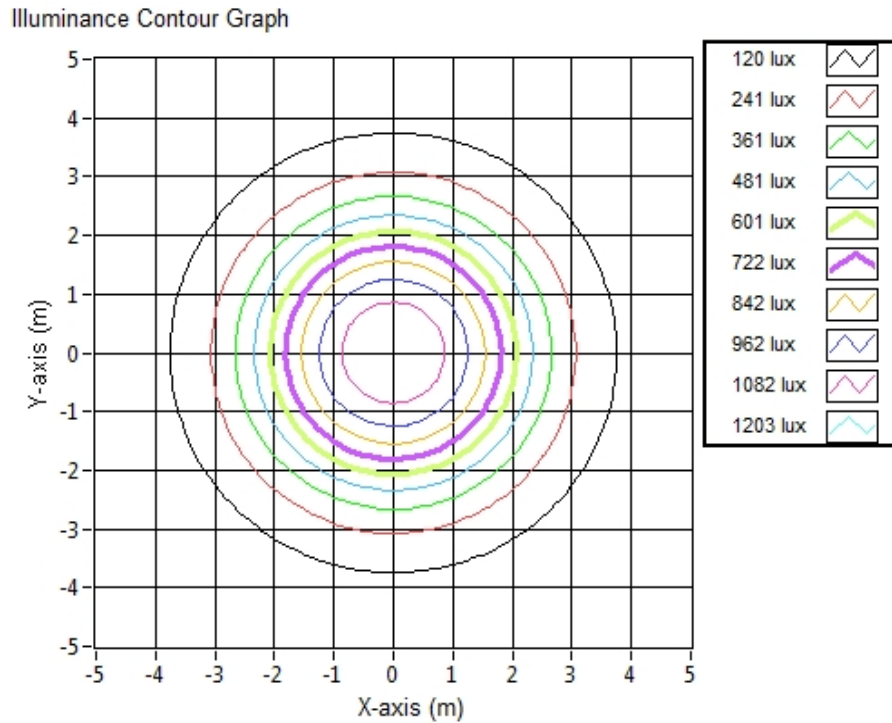
Polar Plot:



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	6.85	6.85	1165.2
6.096	13.70	13.70	291.3
9.144	20.55	20.55	129.5
12.192	27.41	27.41	72.8
15.24	34.26	34.26	46.6
18.288	41.11	41.11	32.4
21.336	47.96	47.96	23.8
24.384	54.81	54.81	18.2
27.432	61.66	61.66	14.4
30.48	68.52	68.52	11.7

Test Results: In Situ Temperature Measurement Test

Results include maximum LED chip temperature for sample number L19022.
Dialight unit model number RRE-5MC2-Gxxx-xxN

LED identified as Seoul Semiconductor part number SAW8C22B.

LED drive current (as indicated by customer): 29 (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:

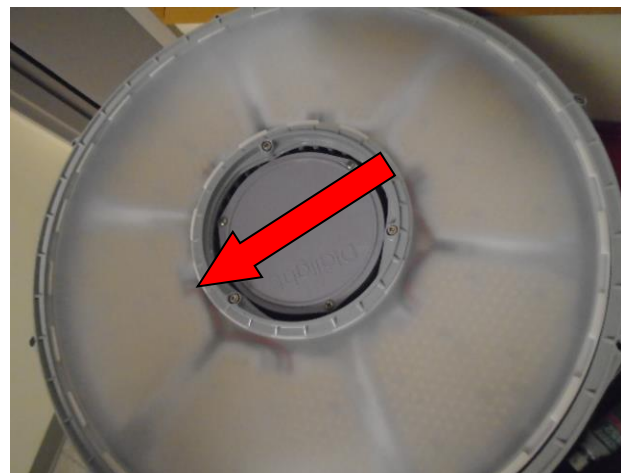
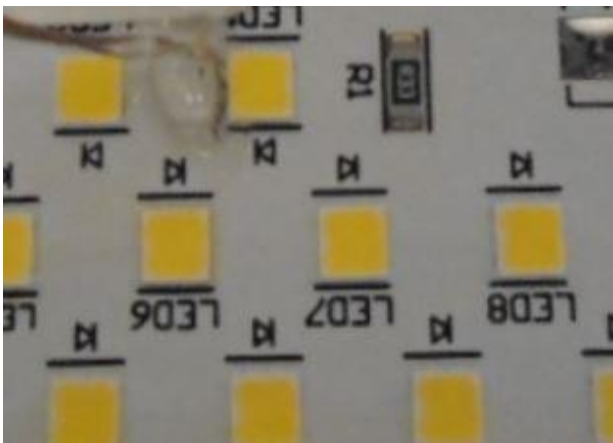
Maximum Power at Indicated Current: 0.174 (W)
Maximum Source Temperature: 122 (°C)

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: 31%

Results:

Measured LED source temperature: 56.7 (°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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 Optical Engineer
 Approved Signatory