

Test Report

Report Number: L19020

Date: May 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-2MC2-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: May 6, 2019 through May 8, 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: L19020
Manufacturer: Dialight Corporation
Product Name: Reliant High Bay
Description: High Bay
Model Number: RRE-2MC2-Gxxx-xxN

Report Summary

Sample number L19020
Dialight unit model number RRE-2MC2-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:	30320 (lumens)	30492 (lumens)
Electrical Power:	195.9 (W)	196.4 (W)
Luminous Efficacy:	154.8 (lumens/W)	155.3 (lumens/W)

Electrical Measurements:

Input Power (230VAC): 195.9 (W)
Power Factor (230VAC): 0.979
Current ATHD % (230VAC): 8.298
Input Power (110VAC): 202.6 (W)
Power Factor (110VAC): 0.997
Current ATHD % (110VAC): 3.82

Color Measurements:

Correlated Color Temperature (CCT): 5067
Color Rendering Index (CRI): 86.8
Chromaticity Coordinate (x): 0.344
Chromaticity Coordinate (y): 0.354
Chromaticity Coordinate (u'): 0.21
Chromaticity Coordinate (v'): 0.324
DUV: 0.0017

Temperature Measurements:

In Situ LED Source Temperature: 56.6 (°C)

Test Results: Integrating Sphere

Results include unit color, flux, efficacy and electrical power for sample number L19020.

Dialight unit model number RRE-2MC2-Gxxx-xxN

Test Conditions:

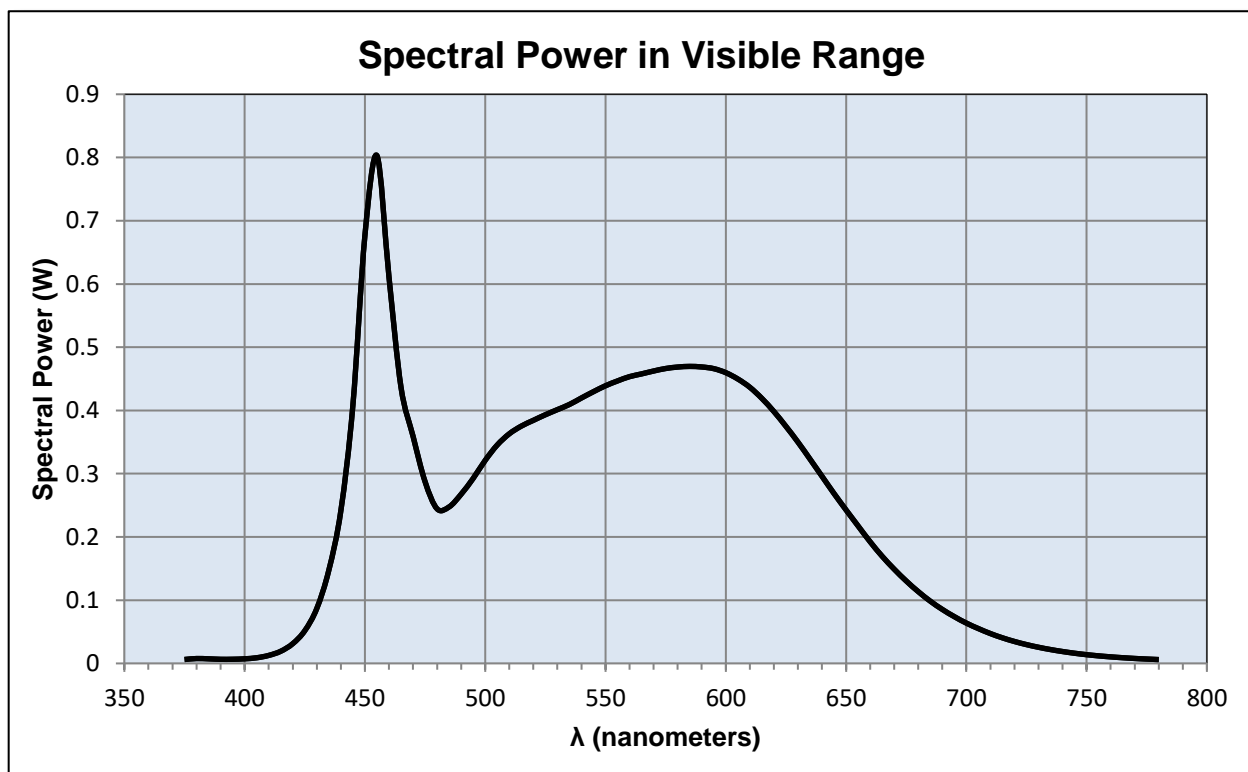
Ambient Temperature: 25 ± 1 (°C)

Electrical Measurements:

Input Voltage: 230 (VAC)
 Input Current: 0.869 (A)
 Input Power: 195.9 (W)
 Input Power Factor: 0.979
 Current ATHD: 8.298 (%)

Photometric measurements:

Luminous Flux: 30320 (lumens)
 Luminous Efficacy: 154.8 (lumens/W)
 Correlated Color Temperature (CCT): 5067 (K)
 CRI -Ra: 86.8
 CRI -R9: 24.8
 DUV: 0.0017
 CIE Coordinate (x): 0.344
 CIE Coordinate (y): 0.354
 CIE Coordinate (u'): 0.21
 CIE Coordinate (v'): 0.324



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	0.006	515	0.375	655	0.217
380	0.008	520	0.384	660	0.192
385	0.007	525	0.393	665	0.170
390	0.007	530	0.401	670	0.149
395	0.007	535	0.409	675	0.130
400	0.007	540	0.420	680	0.114
405	0.009	545	0.430	685	0.099
410	0.013	550	0.439	690	0.085
415	0.019	555	0.447	695	0.074
420	0.031	560	0.453	700	0.064
425	0.052	565	0.458	705	0.055
430	0.087	570	0.462	710	0.047
435	0.147	575	0.466	715	0.040
440	0.242	580	0.469	720	0.035
445	0.408	585	0.470	725	0.030
450	0.677	590	0.469	730	0.026
455	0.803	595	0.466	735	0.022
460	0.611	600	0.460	740	0.019
465	0.437	605	0.450	745	0.016
470	0.359	610	0.437	750	0.014
475	0.287	615	0.419	755	0.012
480	0.244	620	0.398	760	0.010
485	0.248	625	0.375	765	0.009
490	0.268	630	0.350	770	0.008
495	0.293	635	0.323	775	0.007
500	0.321	640	0.296	780	0.006
505	0.345	645	0.269		
510	0.363	650	0.243		

Test Results: Goniometer

Results include unit flux, distribution, efficacy, and electrical power for sample number L19020.
Dialight unit model number RRE-2MC2-Gxxx-xxN

Electrical Measurements:

Input Voltage: 230 (VAC)
Input current: 0.875 (A)
Input Power: 196.4 (W)
Power Factor: 0.976

Photometric measurements:

Absolute Luminous Flux: 30492 (lumens)
Luminous Efficacy: 155.3 (lumens/W)

Intensity Summary:

<u>INTENSITY (CANDLEPOWER) SUMMARY</u>						
ANGLE	ALONG	23	45	67.5	ACROSS	OUTPUT LUMENS
0	11384	11384	11384	11384	11384	
5	11369	11369	11369	11369	11369	425
15	11463	11463	11463	11463	11463	2436
25	12225	12225	12225	12225	12225	4731
35	12389	12389	12389	12389	12389	7109
45	9465	9465	9465	9465	9465	7746
55	4813	4813	4813	4813	4813	5646
65	871	871	871	871	871	1938
75	181	181	181	181	181	350
85	55	55	55	55	55	102
95	0	0	0	0	0	10
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

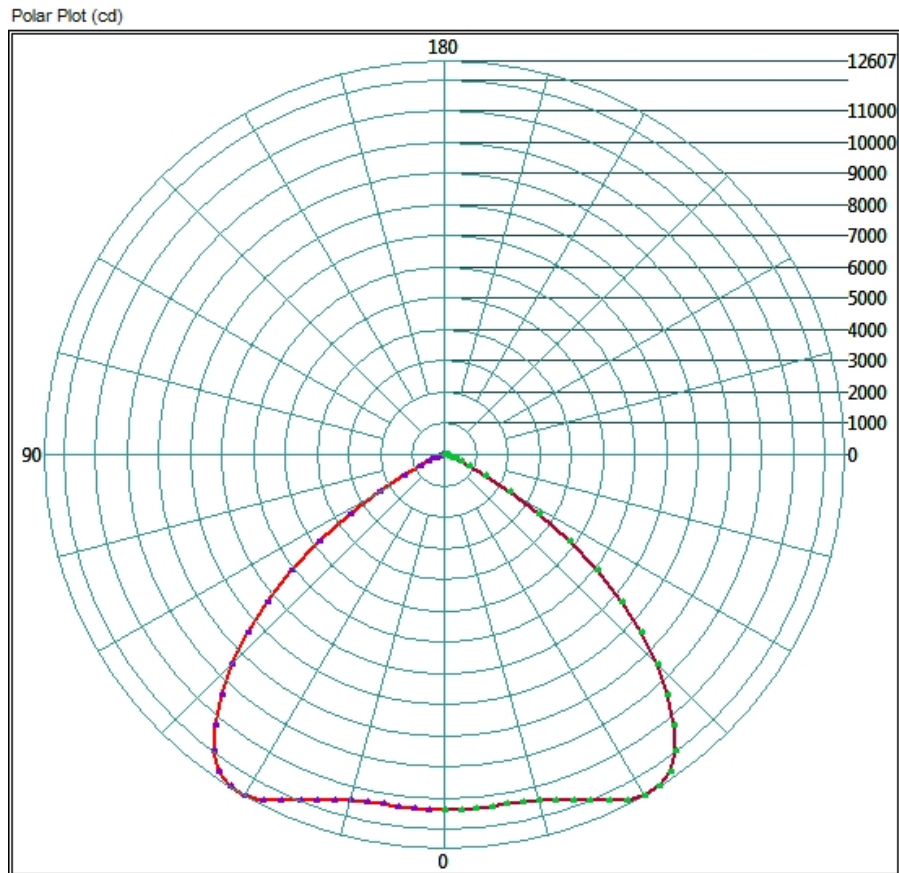
ZONAL LUMEN AND PERCENTAGES

ZONE	LUMENS	% LUMINAIRE
0-30	10896.32	35.7%
0-40	18682.4	61.3%
0-60	29465.12	96.6%
60-90	1583.36	5.2%
0-90	30492.48	100.0%
90-180	0	0.0%
0-180	30492.48	100.0%

Test Results: Goniometer

Results continued from previous page.

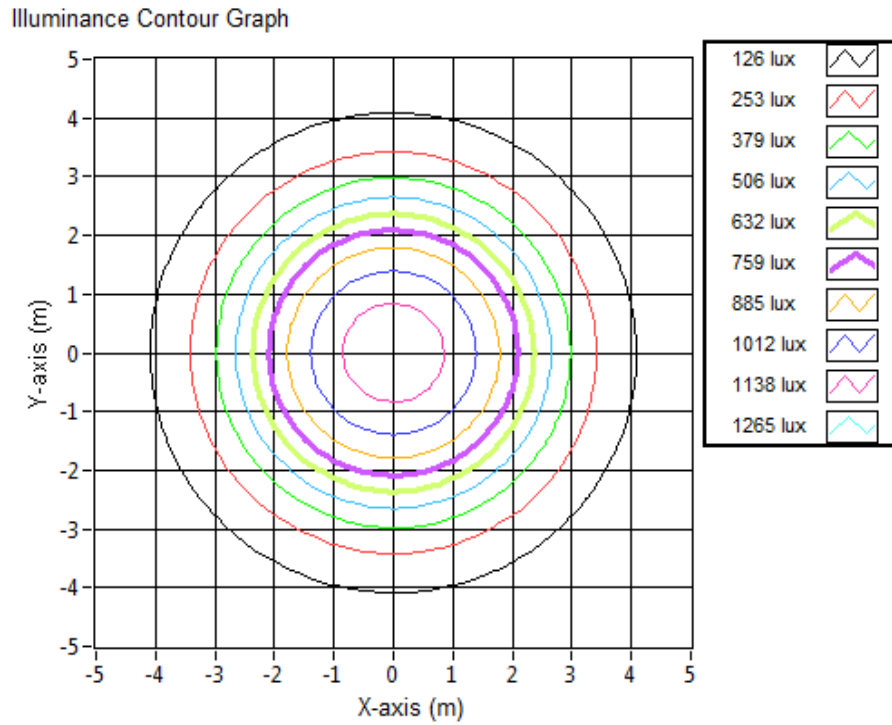
Polar Plot:



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	8.17	8.17	1225.4
6.096	16.34	16.34	306.4
9.144	24.51	24.51	136.2
12.192	32.68	32.68	76.6
15.24	40.85	40.85	49.0
18.288	49.02	49.02	34.0
21.336	57.19	57.19	25.0
24.384	65.36	65.36	19.1
27.432	73.53	73.53	15.1
30.48	81.70	81.70	12.3

Test Results: In Situ Temperature Measurement Test

Results include maximum LED chip temperature for sample number L19020.
Dialight unit model number RRE-2MC2-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:

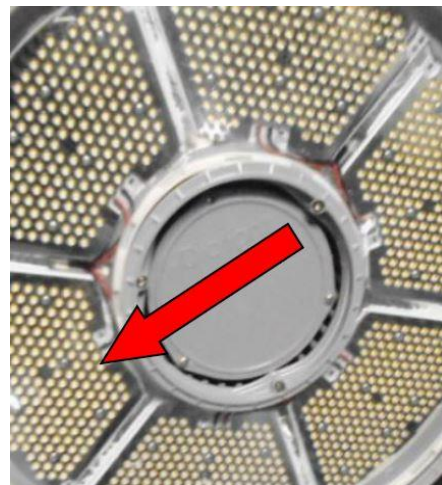
Maximum Power at Indicated Current: 0.174 (W)
Maximum Source Temperature: 122 (°C)

Test Conditions:

Temperature Measurement Location: See Photographs Below
Ambient Temperature: $25^{\circ} \pm 5^{\circ}$ (°C)
Ambient temperature at time of measurement: 24.5 (°C)
Relative humidity at time of measurement: 35%

Results:

Measured LED source temperature: 56.6 (°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
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.

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