

Test Report

Report Number: L19026

Date: Apr 29, 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-7MC2-Jxxx-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 17, 2019 through April 17, 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: L19026
Manufacturer: Dialight Corporation
Product Name: Reliant High Bay
Description: High Bay
Model Number: RRE-7MC2-Jxxx-xxN

Report Summary

Sample number L19026
Dialight unit model number RRE-7MC2-Jxxx-xxN

Photograph(s) of sample:



*Photographs not to scale. For reference only.

Summary of Results:

	<u>Integrating Sphere</u>	<u>Goniophotometer</u>
Luminous Flux:	35170 (lumens)	35128 (lumens)
Electrical Power:	231.1 (W)	230.6 (W)
Luminous Efficacy:	152.3 (lumens/W)	152.4 (lumens/W)

Electrical Measurements:

Input Power (230VAC): 231.1 (W)
Power Factor (230VAC): 0.986
Current ATHD % (230VAC): 8.766
Input Power (110VAC): 241.2 (W)
Power Factor (110VAC): 0.998
Current ATHD % (110VAC): 3.925

Color Measurements:

Correlated Color Temperature (CCT): 5032
Color Rendering Index (CRI): 86.2
Chromaticity Coordinate (x): 0.345
Chromaticity Coordinate (y): 0.355
Chromaticity Coordinate (u'): 0.21
Chromaticity Coordinate (v'): 0.324
DUV: 0.0018

Temperature Measurements:

In Situ LED Source Temperature: 57.3 (°C)

Test Results: Integrating Sphere

Results include unit color, flux, efficacy and electrical power for sample number L19026.
Dialight unit model number RRE-7MC2-Jxxx-xxN

Test Conditions:

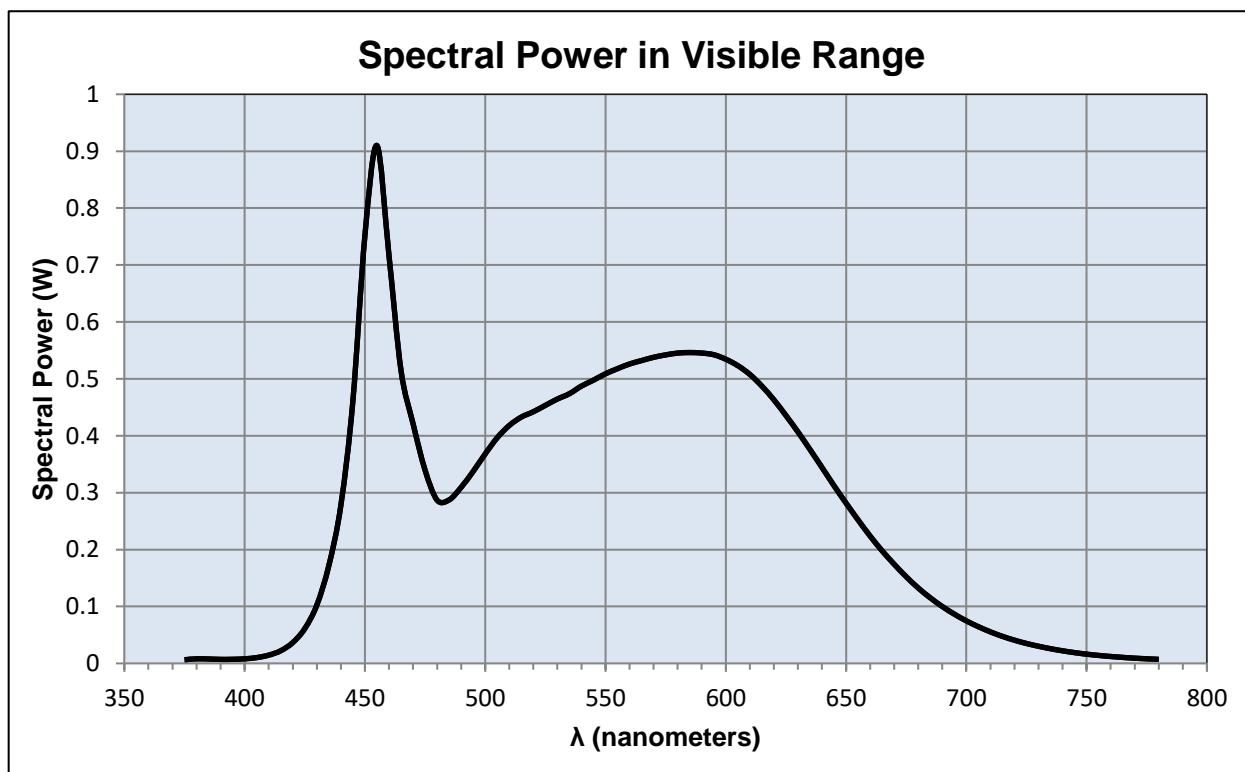
Ambient Temperature: 25 ± 1 (°C)

Electrical Measurements:

Input Voltage: 230 (VAC)
Input Current: 1.018 (A)
Input Power: 231.1 (W)
Input Power Factor: 0.986
Current ATHD: 8.766 (%)

Photometric measurements:

Luminous Flux: 35170 (lumens)
Luminous Efficacy: 152.3 (lumens/W)
Correlated Color Temperature (CCT): 5032 (K)
CRI -Ra: 86.2
CRI -R9: 21.6
DUV: 0.0018
CIE Coordinate (x): 0.345
CIE Coordinate (y): 0.355
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:

$\lambda(\text{nm})$	(W/nm)	$\lambda(\text{nm})$	(W/nm)	$\lambda(\text{nm})$	(W/nm)
375	0.006	515	0.433	655	0.252
380	0.008	520	0.442	660	0.224
385	0.008	525	0.453	665	0.198
390	0.007	530	0.465	670	0.174
395	0.007	535	0.474	675	0.152
400	0.008	540	0.487	680	0.133
405	0.010	545	0.498	685	0.115
410	0.015	550	0.509	690	0.100
415	0.022	555	0.518	695	0.087
420	0.037	560	0.526	700	0.075
425	0.061	565	0.532	705	0.065
430	0.102	570	0.538	710	0.055
435	0.172	575	0.542	715	0.048
440	0.278	580	0.545	720	0.041
445	0.461	585	0.546	725	0.035
450	0.752	590	0.545	730	0.030
455	0.910	595	0.542	735	0.026
460	0.717	600	0.535	740	0.022
465	0.515	605	0.523	745	0.019
470	0.421	610	0.508	750	0.016
475	0.340	615	0.487	755	0.014
480	0.287	620	0.463	760	0.012
485	0.287	625	0.436	765	0.011
490	0.310	630	0.407	770	0.009
495	0.337	635	0.376	775	0.008
500	0.368	640	0.344	780	0.007
505	0.397	645	0.312		
510	0.418	650	0.282		

Test Results: Goniometer

Results include unit flux, distribution, efficacy, and electrical power for sample number L19026.
Dialight unit model number RRE-7MC2-Jxxx-xxN

Electrical Measurements:

Input Voltage: 230 (VAC)
Input current: 1.018 (A)
Input Power: 230.6 (W)
Power Factor: 0.986

Photometric measurements:

Absolute Luminous Flux: 35128 (lumens)
Luminous Efficacy: 152.4 (lumens/W)

Intensity Summary:

<u>INTENSITY (CANDLEPOWER) SUMMARY</u>						
ANGLE	ALONG	23	45	67.5	ACROSS	OUTPUT LUMENS
0	12383	12383	12383	12383	12383	
5	12415	12415	12415	12415	12415	463
15	12964	12964	12964	12964	12964	2763
25	13944	13944	13944	13944	13944	5357
35	14362	14362	14362	14362	14362	8204
45	11204	11204	11204	11204	11204	9098
55	5791	5791	5791	5791	5791	6745
65	842	842	842	842	842	2229
75	72	72	72	72	72	233
85	14	14	14	14	14	33
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

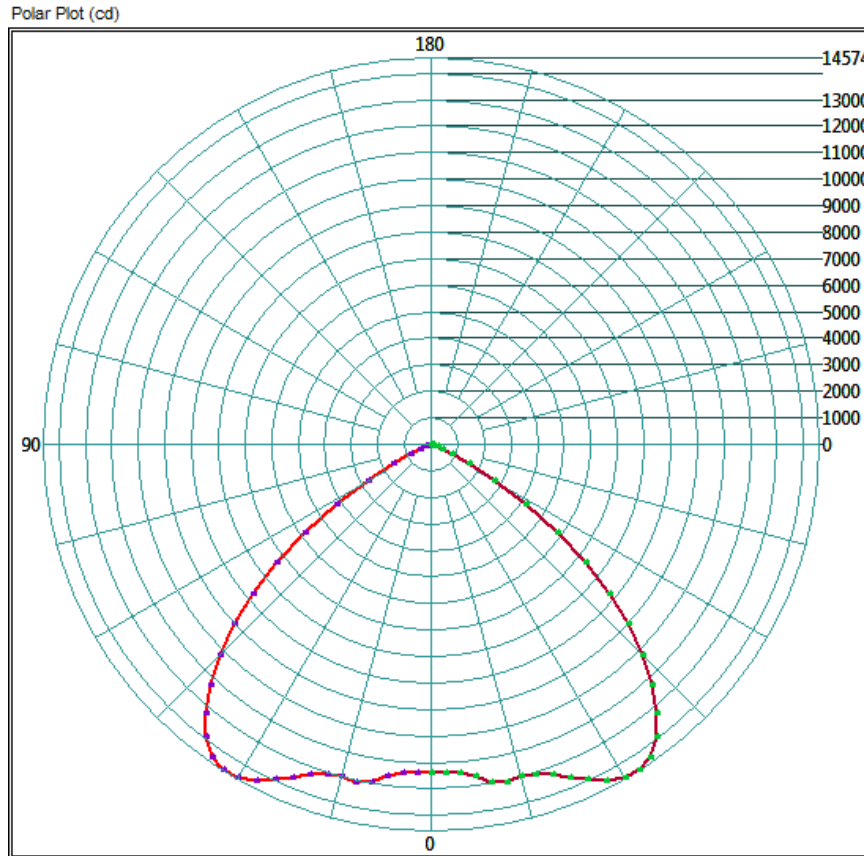
ZONAL LUMEN AND PERCENTAGES

ZONE	LUMENS	% LUMINAIRE
0-30	12382.72	35.3%
0-40	21441.28	61.0%
0-60	34266.24	97.5%
60-90	1517.76	4.3%
0-90	35127.84	100.0%
90-180	0	0.0%
0-180	35127.84	100.0%

Test Results: Goniometer

Results continued from previous page.

Polar Plot:

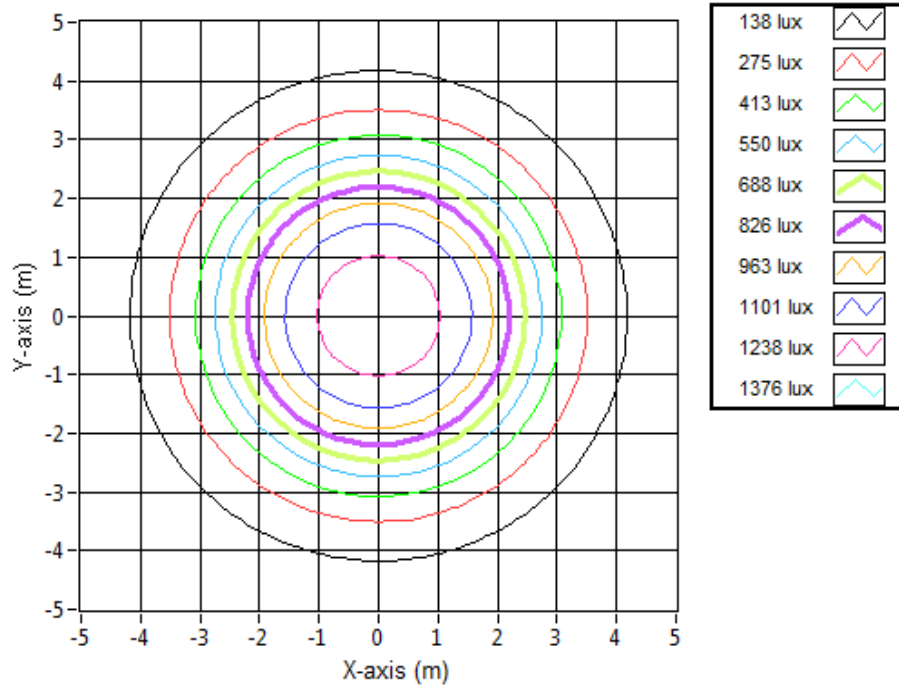


Test Results: Goniometer

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	8.50	8.50	1332.9
6.096	16.99	16.99	333.2
9.144	25.49	25.49	148.1
12.192	33.98	33.98	83.3
15.24	42.48	42.48	53.3
18.288	50.97	50.97	37.0
21.336	59.47	59.47	27.2
24.384	67.96	67.96	20.8
27.432	76.46	76.46	16.5
30.48	84.95	84.95	13.3

Test Results: In Situ Temperature Measurement Test

Results include maximum LED chip temperature for sample number L19026.
Dialight unit model number RRE-7MC2-Jxxx-xxN

LED identified as Seoul Semiconductor part number SAW8C22B.

LED drive current (as indicated by customer): 35 (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:

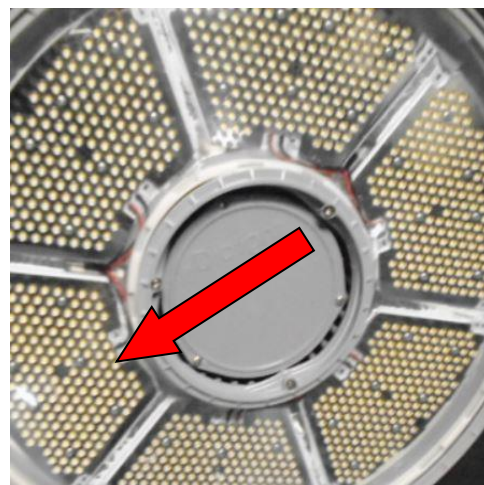
Maximum Power at Indicated Current: 0.21 (W)
Maximum Source Temperature: 121.4 (°C)

Test Conditions:

Temperature Measurement Location: See Photographs Below
Ambient Temperature: $25^{\circ} \pm 5^{\circ}$ (°C)
Ambient temperature at time of measurement: 24.6 (°C)
Relative humidity at time of measurement: 33%

Results:

Measured LED source temperature: 57.3 (°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
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