

Test Report

Report Number: L19064

Date: Jul 29, 2019

Issued by:

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

Test of one Reliant High Bay America
Unit manufacturer: Dialight Corporation
Unit model number: RHU-7MC2-Cxxx-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: July 22, 2019 through July 23, 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

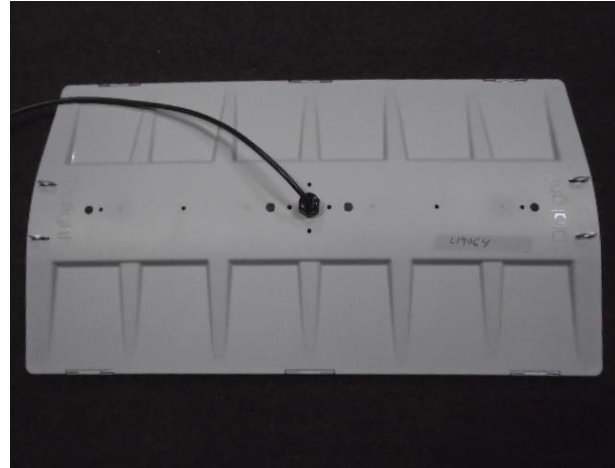
Description of sample:

Sample Number: L19064
Manufacturer: Dialight Corporation
Product Name: 18K Medium Optic CW
Description: Reliant High Bay America
Model Number: RHU-7MC2-Cxxx-xxN

Report Summary

Sample number L19064
Dialight unit model number RHU-7MC2-Cxxx-xxN

Photograph(s) of sample:



*Photographs not to scale. For reference only.

Summary of Results:

	<u>Integrating Sphere</u>	<u>Goniophotometer</u>
Luminous Flux:	18001 (lumens)	18135 (lumens)
Electrical Power:	125.8 (W)	126.7 (W)
Luminous Efficacy:	143.1 (lumens/W)	143.1 (lumens/W)

Electrical Measurements:

Input Power (120VAC): 125.8 (W)
Power Factor (120VAC): 0.994
Current ATHD % (120VAC): 4.584
Input Power (277VAC): 122.4 (W)
Power Factor (277VAC): 0.924
Current ATHD % (277VAC): 9.209

Color Measurements:

Correlated Color Temperature (CCT): 4930
Color Rendering Index (CRI): 83.9
Chromaticity Coordinate (x): 0.348
Chromaticity Coordinate (y): 0.361
Chromaticity Coordinate (u'): 0.21
Chromaticity Coordinate (v'): 0.326
DUV: 0.0035

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 L19064.
Dialight unit model number RHU-7MC2-Cxxx-xxN

Test Conditions:

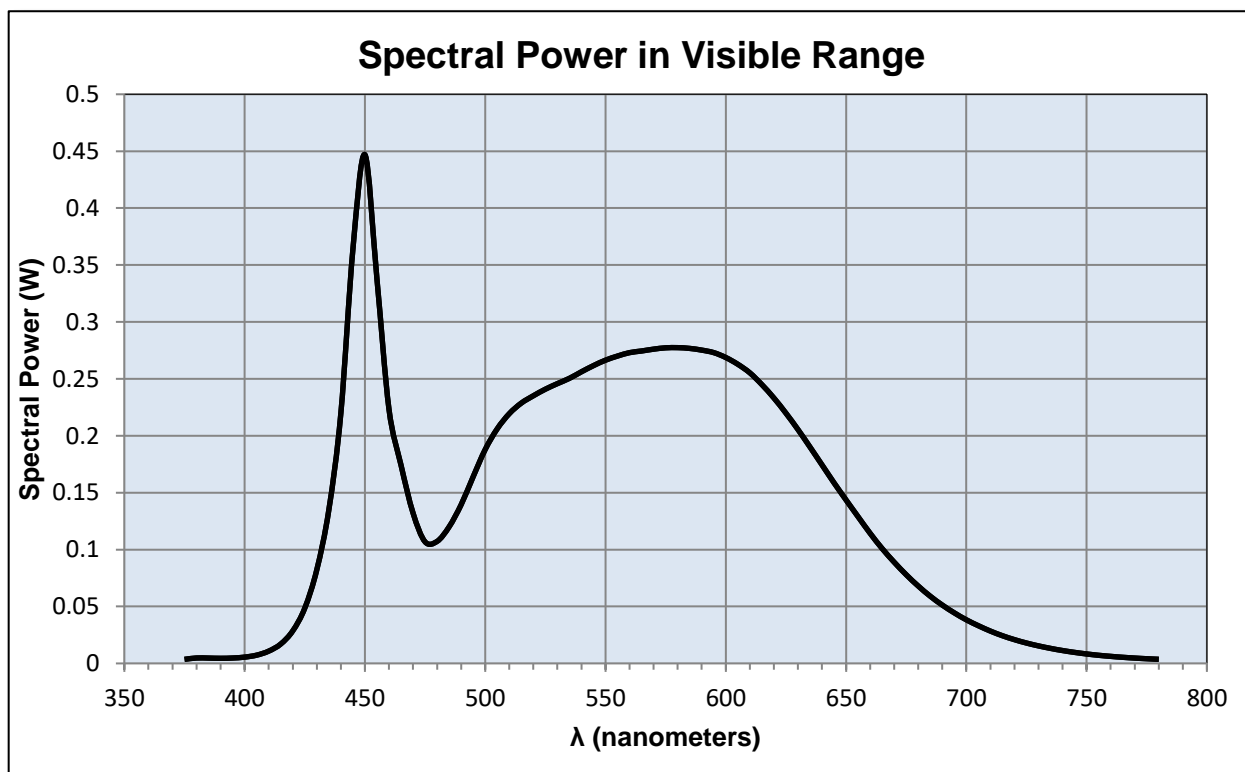
Ambient Temperature: 25 ± 1 (°C)

Electrical Measurements:

Input Voltage: 120 (VAC)
Input Current: 1.055 (A)
Input Power: 125.8 (W)
Input Power Factor: 0.994
Current ATHD: 4.584 (%)

Photometric measurements:

Luminous Flux: 18001 (lumens)
Luminous Efficacy: 143.1 (lumens/W)
Correlated Color Temperature (CCT): 4930 (K)
CRI -Ra: 83.9
CRI -R9: 15.1
DUV: 0.0035
CIE Coordinate (x): 0.348
CIE Coordinate (y): 0.361
CIE Coordinate (u'): 0.21
CIE Coordinate (v'): 0.326



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	0.004	515	0.229	655	0.129
380	0.005	520	0.235	660	0.114
385	0.005	525	0.241	665	0.101
390	0.004	530	0.246	670	0.089
395	0.005	535	0.250	675	0.078
400	0.006	540	0.256	680	0.068
405	0.007	545	0.262	685	0.059
410	0.011	550	0.266	690	0.051
415	0.017	555	0.270	695	0.044
420	0.029	560	0.273	700	0.038
425	0.049	565	0.274	705	0.033
430	0.082	570	0.276	710	0.028
435	0.135	575	0.277	715	0.024
440	0.220	580	0.277	720	0.021
445	0.364	585	0.277	725	0.018
450	0.447	590	0.275	730	0.015
455	0.338	595	0.273	735	0.013
460	0.223	600	0.269	740	0.011
465	0.174	605	0.263	745	0.010
470	0.132	610	0.255	750	0.008
475	0.107	615	0.245	755	0.007
480	0.107	620	0.233	760	0.006
485	0.120	625	0.220	765	0.005
490	0.139	630	0.206	770	0.005
495	0.164	635	0.190	775	0.004
500	0.188	640	0.174	780	0.004
505	0.206	645	0.159		
510	0.219	650	0.144		

Test Results: Goniometer

Results include unit flux, distribution, efficacy, and electrical power for sample number L19064.
Dialight unit model number RHU-7MC2-Cxxx-xxN

Electrical Measurements:

Input Voltage: 120 (VAC)
Input current: 1.063 (A)
Input Power: 126.7 (W)
Power Factor: 0.991

Photometric measurements:

Absolute Luminous Flux: 18135 (lumens)
Luminous Efficacy: 143.1 (lumens/W)

Intensity Summary:

<u>INTENSITY (CANDLEPOWER) SUMMARY</u>						
ANGLE	ALONG	25	45	72.5	ACROSS	OUTPUT LUMENS
0	7097	7097	7097	7097	7097	
5	7226	7270	7150	7128	7108	267
15	7730	7716	7553	7385	7178	1585
25	8276	8549	8402	8251	7816	3182
35	7947	8149	8148	7928	7572	4703
45	5598	5561	5591	5467	5304	4705
55	1857	1782	1751	1627	1546	2670
65	553	610	656	505	463	728
75	42	35	44	49	58	283
85	0	0	0	0	0	13
95	0	0	0	0	0	0
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

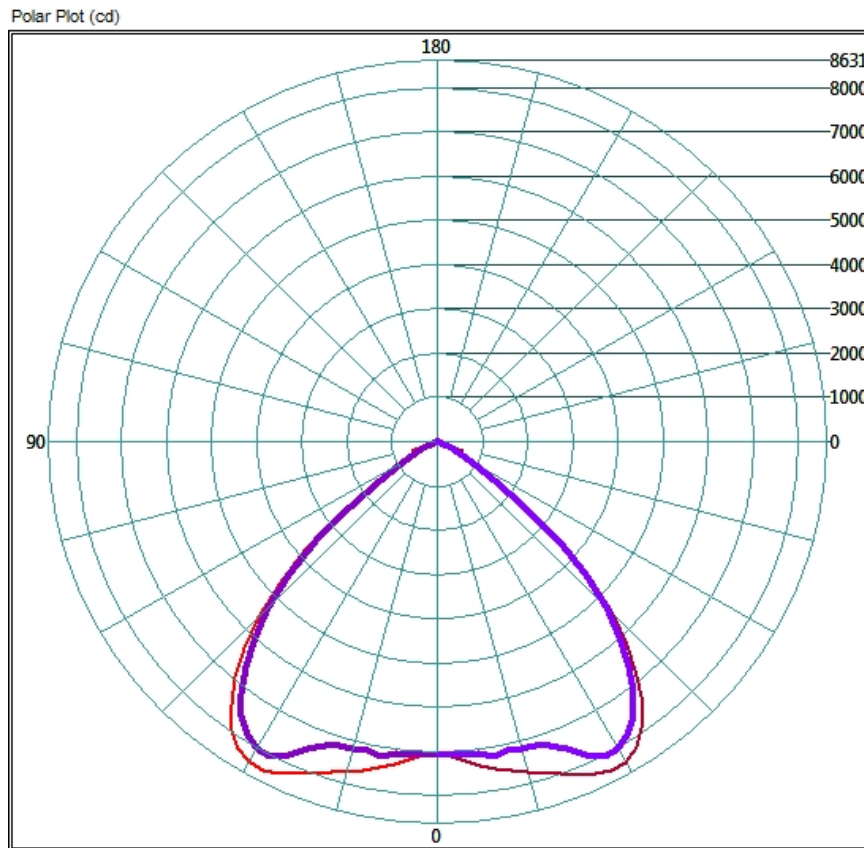
ZONAL LUMEN AND PERCENTAGES

ZONE	LUMENS	% LUMINAIRE
0-30	7261.69	40.0%
0-40	12213.28	67.3%
0-60	17548.32	96.8%
60-90	768.93	4.2%
0-90	18135.3	100.0%
90-180	0	0.0%
0-180	18135.3	100.0%

Test Results: Goniometer

Results continued from previous page.

Polar Plot:

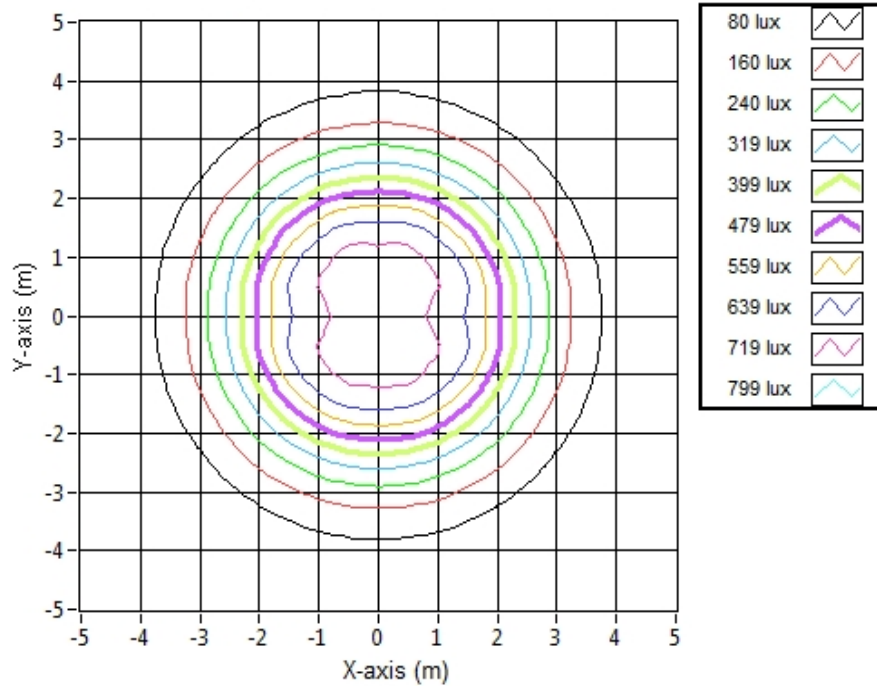


Test Results: Goniometer

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	7.41	7.24	763.9
6.096	14.81	14.47	191.0
9.144	22.22	21.71	84.9
12.192	29.62	28.95	47.7
15.24	37.03	36.19	30.6
18.288	44.43	43.42	21.2
21.336	51.84	50.66	15.6
24.384	59.24	57.90	11.9
27.432	66.65	65.13	9.4
30.48	74.05	72.37	7.6

Test Results: In Situ Temperature Measurement Test

Results include maximum LED chip temperature for sample number L19064.
Dialight unit model number RHU-7MC2-Cxxx-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:

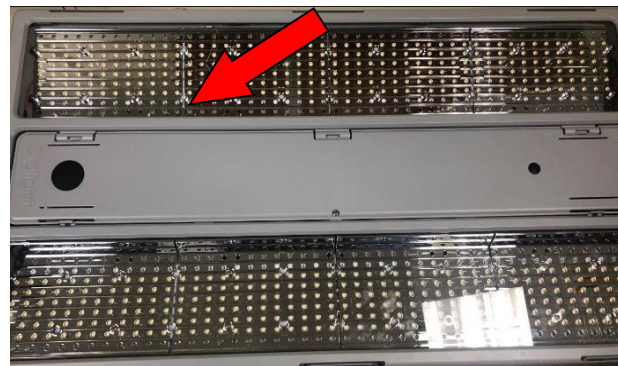
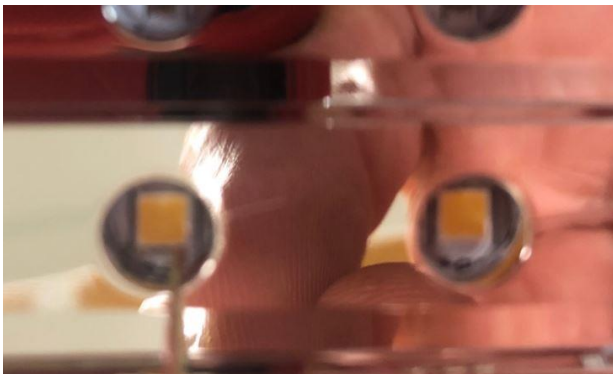
Maximum Power at Indicated Current: 0.21 (W)
Maximum Source Temperature: 121.4 (°C)

Test Conditions:

Temperature Measurement Location: See Photographs Below
Ambient Temperature: $25^{\circ} \pm 5^{\circ}$ (°C)
Ambient temperature at time of measurement: 23.5 (°C)
Relative humidity at time of measurement: 49%

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
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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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Dialight Optics Laboratory
Optical Engineer
Approved Signatory