

# Test Report

Report Number: L19031

Date: May 9, 2019

Issued by:

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

Test of one Reliant High Bay  
Unit manufacturer: Dialight Corporation  
Unit model number: RRE-7MC2-Exxx-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 26, 2019 through May 3, 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: L19031  
Manufacturer: Dialight Corporation  
Product Name: Reliant High Bay - RRE-7MC2-Exxx-xxN  
Description: Reliant High Bay  
Model Number: RRE-7MC2-Exxx-xxN

## Report Summary

Sample number L19031  
Dialight unit model number RRE-7MC2-Exxx-xxN

### Photograph(s) of sample:



\*Photographs not to scale. For reference only.

### Summary of Results:

	<u>Integrating Sphere</u>	<u>Goniophotometer</u>
Luminous Flux:	24001 (lumens)	24115 (lumens)
Electrical Power:	159.4 (W)	159.6 (W)
Luminous Efficacy:	150.7 (lumens/W)	151.1 (lumens/W)

### Electrical Measurements:

Input Power (230 VAC): 159.4 (W)  
Power Factor (230 VAC): 0.973  
Current ATHD % (230 VAC): 0.085  
Input Power (110 VAC): 164.9 (W)  
Power Factor (110 VAC): 0.996  
Current ATHD % (110 VAC): 4.307

### Color Measurements:

Correlated Color Temperature (CCT): 4991  
Color Rendering Index (CRI): 86.4  
Chromaticity Coordinate (x): 0.346  
Chromaticity Coordinate (y): 0.355  
Chromaticity Coordinate (u'): 0.21  
Chromaticity Coordinate (v'): 0.324  
DUV: 0.0016

### Temperature Measurements:

In Situ LED Source Temperature: 49.7 (°C)

## Test Results: Integrating Sphere

Results include unit color, flux, efficacy and electrical power for sample number L19031.

Dialight unit model number RRE-7MC2-Exxx-xxN

### Test Conditions:

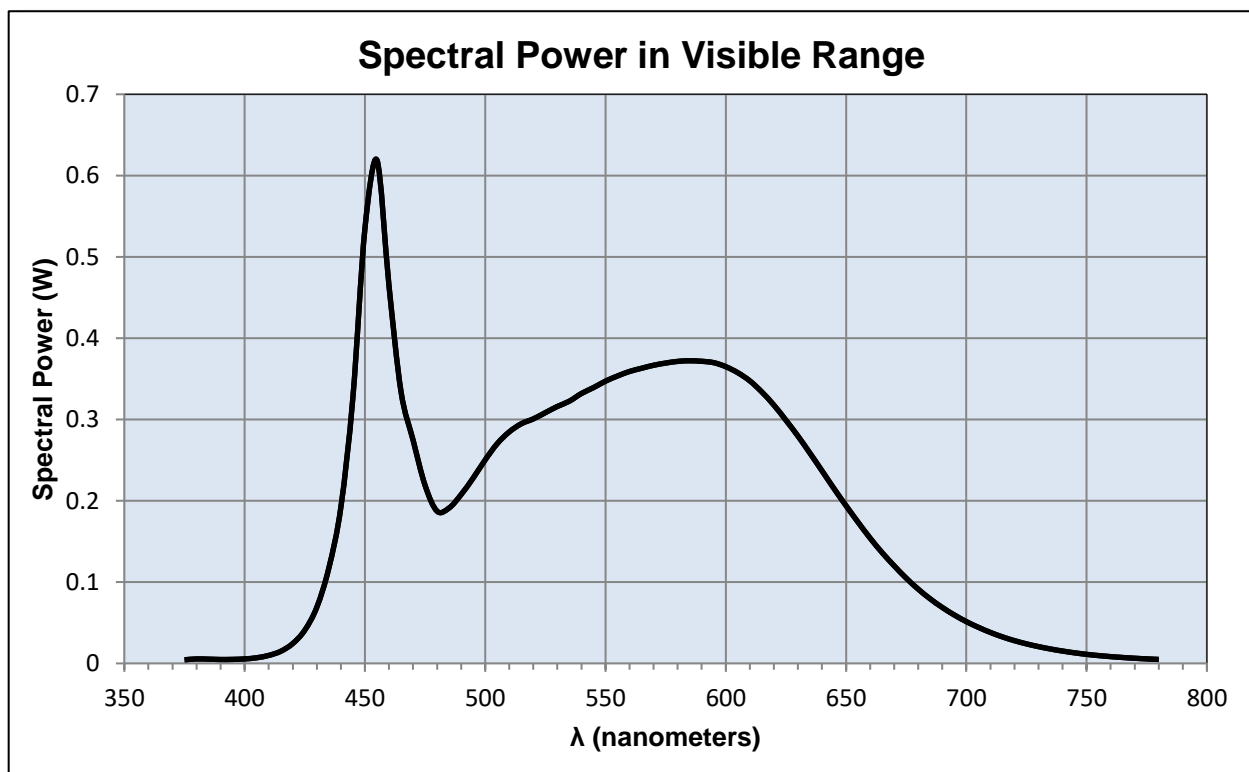
Ambient Temperature:  $25 \pm 1$  (°C)

### Electrical Measurements:

Input Voltage: 230 (VAC)  
Input Current: 0.713 (A)  
Input Power: 159.4 (W)  
Input Power Factor: 0.973  
Current ATHD: 0.085 (%)

### Photometric measurements:

Luminous Flux: 24001 (lumens)  
Luminous Efficacy: 150.7 (lumens/W)  
Correlated Color Temperature (CCT): 4991 (K)  
CRI -Ra: 86.4  
CRI -R9: 23.3  
DUV: 0.0016  
CIE Coordinate (x): 0.346  
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	0.004	515	0.295	655	0.174
380	0.006	520	0.301	660	0.154
385	0.005	525	0.308	665	0.136
390	0.005	530	0.316	670	0.120
395	0.005	535	0.323	675	0.105
400	0.006	540	0.332	680	0.091
405	0.007	545	0.339	685	0.079
410	0.010	550	0.347	690	0.069
415	0.015	555	0.354	695	0.060
420	0.024	560	0.359	700	0.051
425	0.041	565	0.363	705	0.044
430	0.069	570	0.367	710	0.038
435	0.117	575	0.369	715	0.033
440	0.192	580	0.371	720	0.028
445	0.327	585	0.372	725	0.024
450	0.535	590	0.372	730	0.021
455	0.619	595	0.370	735	0.018
460	0.465	600	0.365	740	0.015
465	0.334	605	0.358	745	0.013
470	0.275	610	0.348	750	0.011
475	0.219	615	0.334	755	0.010
480	0.187	620	0.318	760	0.008
485	0.191	625	0.299	765	0.007
490	0.208	630	0.280	770	0.006
495	0.228	635	0.259	775	0.006
500	0.250	640	0.237	780	0.005
505	0.270	645	0.215		
510	0.285	650	0.194		

## Test Results: Goniometer

Results include unit flux, distribution, efficacy, and electrical power for sample number L19031.  
Dialight unit model number RRE-7MC2-Exxx-xxN

### Electrical Measurements:

Input Voltage: 230 (VAC)  
Input current: 0.716 (A)  
Input Power: 159.6 (W)  
Power Factor: 0.97

### Photometric measurements:

Absolute Luminous Flux: 24115 (lumens)  
Luminous Efficacy: 151.1 (lumens/W)

### Intensity Summary:

<u>INTENSITY (CANDLEPOWER) SUMMARY</u>						
ANGLE	ALONG	23	45	67.5	ACROSS	OUTPUT LUMENS
0	8636	8641	8635	8625	8644	
5	8596	8607	8606	8602	8622	322
15	8726	8718	8686	8657	8655	1847
25	9467	9491	9553	9325	9461	3668
35	9788	9880	10105	9800	10017	5589
45	7762	7974	8240	8150	8377	6332
55	3891	4144	4367	4422	4636	4714
65	495	566	641	709	763	1492
75	44	46	53	60	65	130
85	7	8	9	11	11	21
95	0	0	0	0	0	1
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

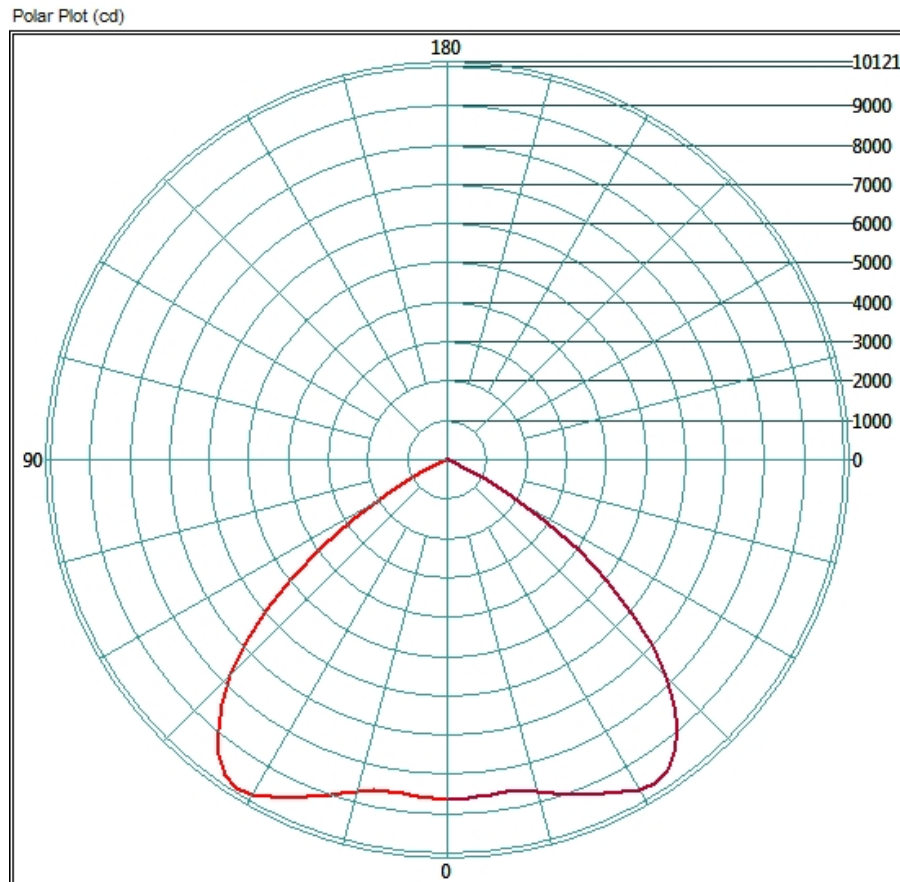
### ZONAL LUMEN AND PERCENTAGES

ZONE	LUMENS	% LUMINAIRE
0-30	8414.11	34.9%
0-40	14639.31	60.7%
0-60	23578.73	97.8%
60-90	977.08	4.1%
0-90	24115.14	100.0%
90-180	0	0.0%
0-180	24115.14	100.0%

## Test Results: Goniometer

Results continued from previous page.

### Polar Plot:

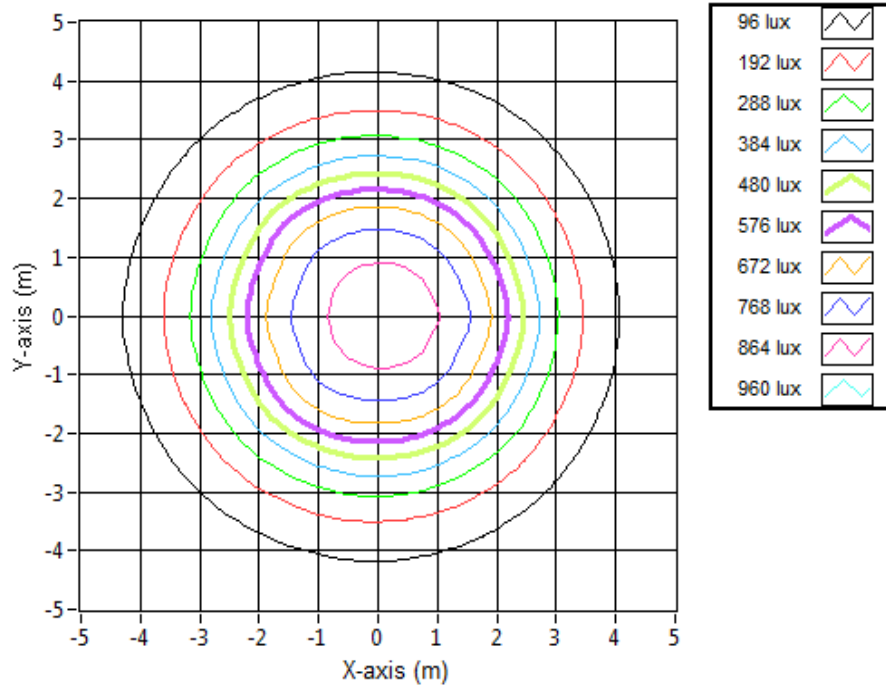


## Test Results: Goniometer

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	8.44	8.50	929.5
6.096	16.88	17.01	232.4
9.144	25.32	25.51	103.3
12.192	33.77	34.02	58.1
15.24	42.21	42.52	37.2
18.288	50.65	51.03	25.8
21.336	59.09	59.53	19.0
24.384	67.53	68.04	14.5
27.432	75.97	76.54	11.5
30.48	84.41	85.05	9.3

## Test Results: In Situ Temperature Measurement Test

Results include maximum LED chip temperature for sample number L19031.  
Dialight unit model number RRE-7MC2-Exxx-xxN

LED identified as Seoul Semiconductor part number SAW8C22B.

LED drive current (as indicated by customer): 38.11 (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:

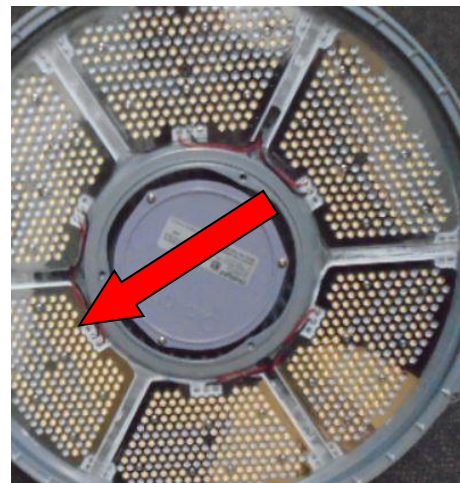
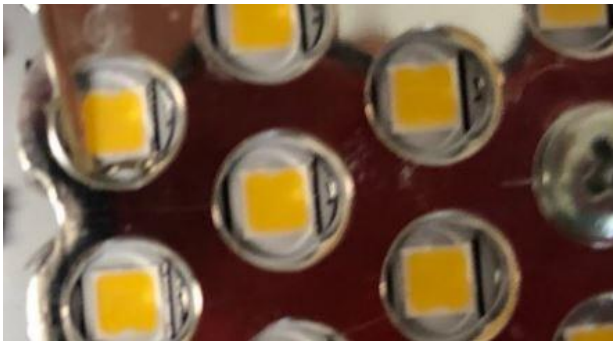
Maximum Power at Indicated Current:	0.229	(W)
Maximum Source Temperature:	121.1	(°C)

### Test Conditions:

Temperature Measurement Location:	See Photographs Below
Ambient Temperature:	25° ± 5' (°C)
Ambient temperature at time of measurement:	24 (°C)
Relative humidity at time of measurement:	39%

### Results:

**Measured LED source temperature:** 49.7 (°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.

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