

Test Report

Report Number: L19032

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-5MC2-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: May 1, 2019 through May 7, 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: L19032
Manufacturer: Dialight Corporation
Product Name: Reliant High Bay - RRE-5MC2-Exxx-xxN
Description: Reliant High Bay
Model Number: RRE-5MC2-Exxx-xxN

Report Summary

Sample number L19032
Dialight unit model number RRE-5MC2-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:	20550 (lumens)	20667 (lumens)
Electrical Power:	159.4 (W)	159.4 (W)
Luminous Efficacy:	129 (lumens/W)	129.6 (lumens/W)

Electrical Measurements:

Input Power (230 VAC): 159.4 (W)
Power Factor (230 VAC): 0.978
Current ATHD % (230 VAC): 8.376
Input Power (110 VAC): 164.9 (W)
Power Factor (110 VAC): 0.997
Current ATHD % (110 VAC): 4.287

Color Measurements:

Correlated Color Temperature (CCT): 5088
Color Rendering Index (CRI): 87.2
Chromaticity Coordinate (x): 0.343
Chromaticity Coordinate (y): 0.352
Chromaticity Coordinate (u'): 0.21
Chromaticity Coordinate (v'): 0.323
DUV: 0.0012

Temperature Measurements:

In Situ LED Source Temperature: 48.4 (°C)

Test Results: Integrating Sphere

Results include unit color, flux, efficacy and electrical power for sample number L19032.

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

Test Conditions:

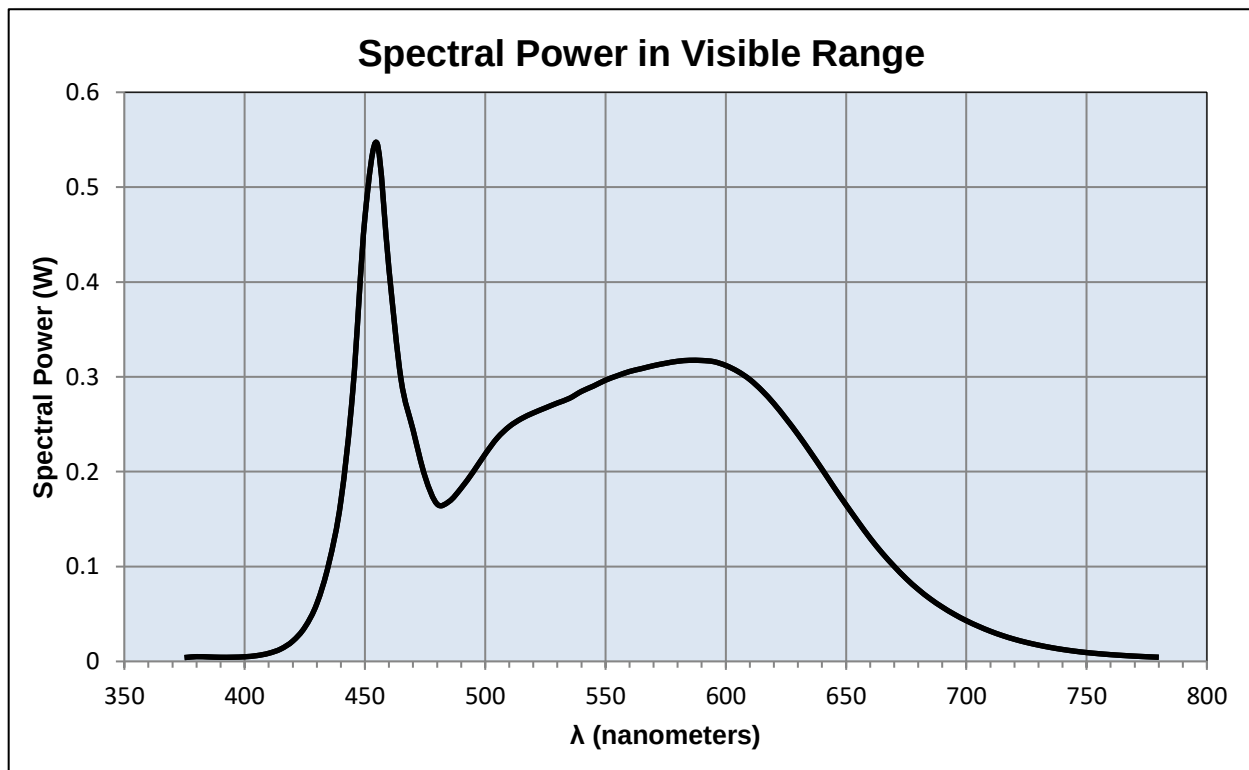
Ambient Temperature: 25 ± 1 (°C)

Electrical Measurements:

Input Voltage: 230 (VAC)
Input Current: 0.71 (A)
Input Power: 159.4 (W)
Input Power Factor: 0.978
Current ATHD: 8.376 (%)

Photometric measurements:

Luminous Flux: 20550 (lumens)
Luminous Efficacy: 129.0 (lumens/W)
Correlated Color Temperature (CCT): 5088 (K)
CRI -Ra: 87.2
CRI -R9: 26.5
DUV: 0.0012
CIE Coordinate (x): 0.343
CIE Coordinate (y): 0.352
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	0.004	515	0.256	655	0.147
380	0.005	520	0.262	660	0.130
385	0.005	525	0.267	665	0.114
390	0.004	530	0.272	670	0.100
395	0.004	535	0.277	675	0.087
400	0.005	540	0.285	680	0.076
405	0.006	545	0.290	685	0.066
410	0.009	550	0.296	690	0.057
415	0.013	555	0.301	695	0.050
420	0.021	560	0.306	700	0.043
425	0.036	565	0.309	705	0.037
430	0.061	570	0.312	710	0.032
435	0.103	575	0.314	715	0.027
440	0.169	580	0.316	720	0.023
445	0.286	585	0.317	725	0.020
450	0.468	590	0.317	730	0.017
455	0.547	595	0.316	735	0.015
460	0.413	600	0.312	740	0.013
465	0.297	605	0.306	745	0.011
470	0.244	610	0.297	750	0.009
475	0.195	615	0.286	755	0.008
480	0.166	620	0.272	760	0.007
485	0.169	625	0.256	765	0.006
490	0.183	630	0.239	770	0.006
495	0.200	635	0.221	775	0.005
500	0.219	640	0.203	780	0.004
505	0.236	645	0.184		
510	0.248	650	0.165		

Test Results: Goniometer

Results include unit flux, distribution, efficacy, and electrical power for sample number L19032.
Dialight unit model number RRE-5MC2-Exxx-xxN

Electrical Measurements:

Input Voltage: 230 (VAC)
Input current: 0.715 (A)
Input Power: 159.4 (W)
Power Factor: 0.969

Photometric measurements:

Absolute Luminous Flux: 20667 (lumens)
Luminous Efficacy: 129.6 (lumens/W)

Intensity Summary:

INTENSITY (CANDLEPOWER) SUMMARY						
ANGLE	ALONG	23	45	67.5	ACROSS	OUTPUT LUMENS
0	8869	8869	8869	8869	8869	
5	8876	8876	8876	8876	8876	331
15	8952	8952	8952	8952	8952	1907
25	8922	8922	8922	8922	8922	3560
35	7840	7840	7840	7840	7840	4739
45	5299	5299	5299	5299	5299	4538
55	2658	2658	2658	2658	2658	3046
65	1096	1096	1096	1096	1096	1510
75	487	487	487	487	487	694
85	184	184	184	184	184	313
95	0	0	0	0	0	29
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

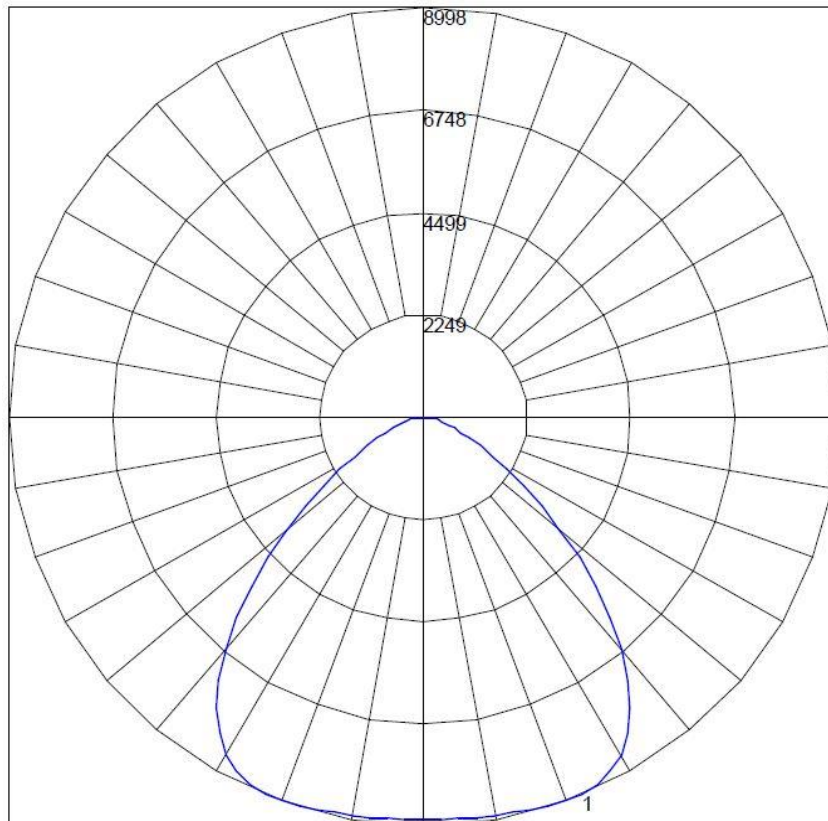
ZONAL LUMEN AND PERCENTAGES

ZONE	LUMENS	% LUMINAIRE
0-30	8087.52	39.1%
0-40	12935.52	62.6%
0-60	19024.48	92.1%
60-90	2050.08	9.9%
0-90	20666.72	100.0%
90-180	0	0.0%
0-180	20666.72	100.0%

Test Results: Goniometer

Results continued from previous page.

Polar Plot:

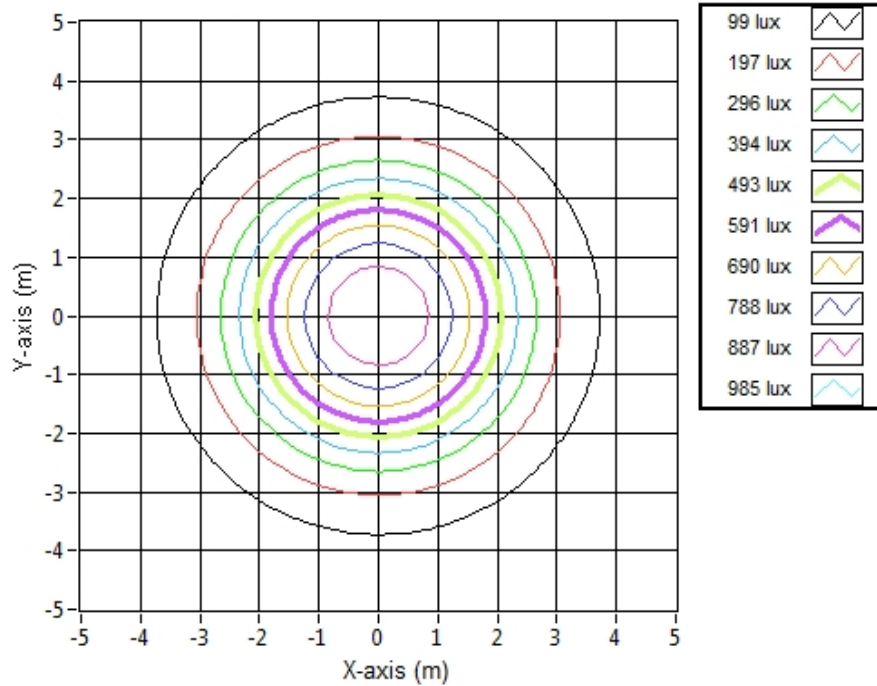


Test Results: Goniometer

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	6.78	6.78	954.7
6.096	13.56	13.56	238.7
9.144	20.34	20.34	106.1
12.192	27.12	27.12	59.7
15.24	33.90	33.90	38.2
18.288	40.68	40.68	26.5
21.336	47.46	47.46	19.5
24.384	54.25	54.25	14.9
27.432	61.03	61.03	11.8
30.48	67.81	67.81	9.5

Test Results: In Situ Temperature Measurement Test

Results include maximum LED chip temperature for sample number L19032.
Dialight unit model number RRE-5MC2-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:	24.5 (°C)
Relative humidity at time of measurement:	30%

Results:

Measured LED source temperature: 48.4 (°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.
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