

Test Report

Report Number: L19045

Date: May 23, 2019

Issued by:

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

Test of one Reliant High Bay EMEA/APAC
Unit manufacturer: Dialight Corporation
Unit model number: RRE-4AC2-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: May 20, 2019 through May 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: L19045
Manufacturer: Dialight Corporation
Product Name: 36K Aisle Optic
Description: Reliant High Bay EMEA/APAC
Model Number: RRE-4AC2-Jxxx-xxN

Report Summary

Sample number L19045
Dialight unit model number RRE-4AC2-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:	32930 (lumens)	33362 (lumens)
Electrical Power:	230.5 (W)	230.9 (W)
Luminous Efficacy:	143 (lumens/W)	144.5 (lumens/W)

Electrical Measurements:

Input Power (120): 230.5 (W)
Power Factor (120): 0.976
Current ATHD % (120): 10.21
Input Power (277): 240.1 (W)
Power Factor (277): 0.997
Current ATHD % (277): 4.893

Color Measurements:

Correlated Color Temperature (CCT): 3976
Color Rendering Index (CRI): 84.4
Chromaticity Coordinate (x): 0.382
Chromaticity Coordinate (y): 0.38
Chromaticity Coordinate (u'): 0.225
Chromaticity Coordinate (v'): 0.336
DUV: 0.001

Temperature Measurements:

In Situ LED Source Temperature: 59.7 (°C)

Test Results: Integrating Sphere

Results include unit color, flux, efficacy and electrical power for sample number L19045.

Dialight unit model number RRE-4AC2-Jxxx-xxN

Test Conditions:

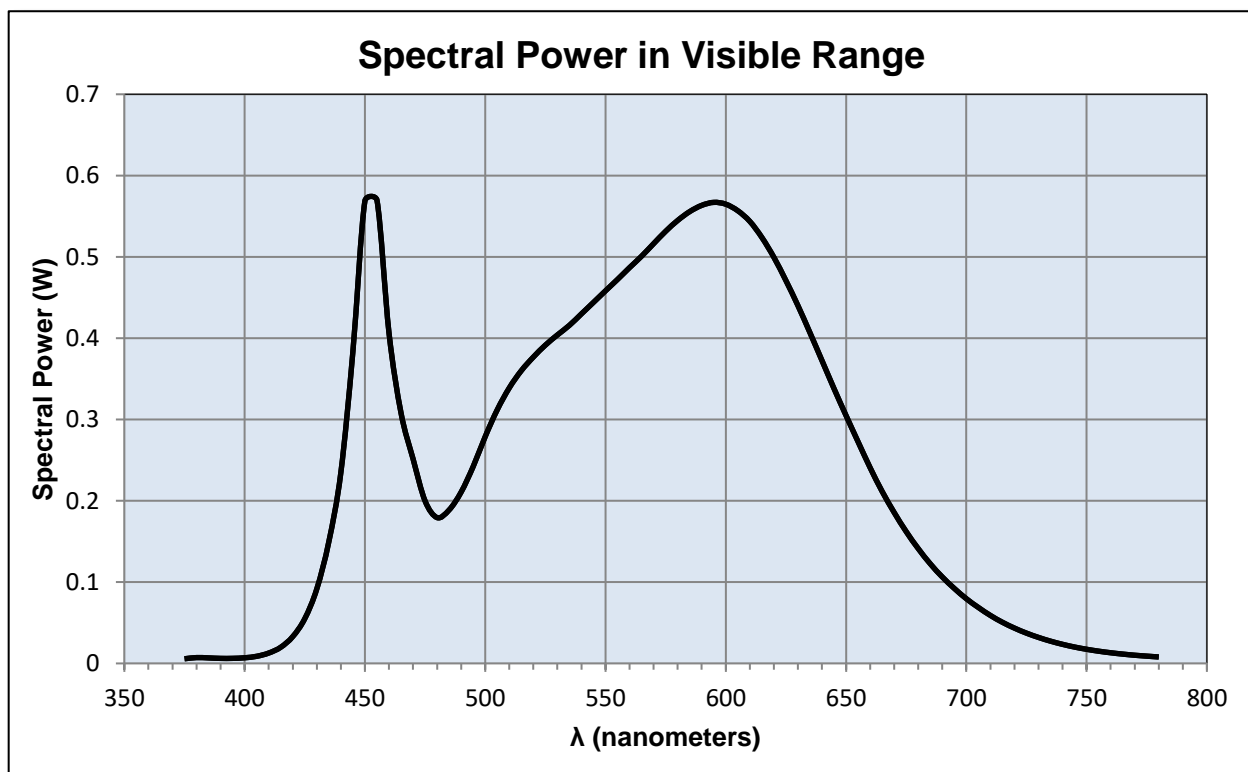
Ambient Temperature: 25 ± 1 (°C)

Electrical Measurements:

Input Voltage: 230 (VAC)
 Input Current: 1.025 (A)
 Input Power: 230.5 (W)
 Input Power Factor: 0.976
 Current ATHD: 10.21 (%)

Photometric measurements:

Luminous Flux: 32930 (lumens)
 Luminous Efficacy: 143.0 (lumens/W)
 Correlated Color Temperature (CCT): 3976 (K)
 CRI -Ra: 84.4
 CRI -R9: 15
 DUV: 0.001
 CIE Coordinate (x): 0.382
 CIE Coordinate (y): 0.38
 CIE Coordinate (u'): 0.225
 CIE Coordinate (v'): 0.336



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	0.360	655	0.273
380	0.007	520	0.377	660	0.241
385	0.007	525	0.391	665	0.212
390	0.006	530	0.404	670	0.186
395	0.006	535	0.416	675	0.162
400	0.007	540	0.430	680	0.141
405	0.009	545	0.444	685	0.123
410	0.013	550	0.458	690	0.106
415	0.020	555	0.472	695	0.092
420	0.033	560	0.487	700	0.080
425	0.055	565	0.501	705	0.069
430	0.092	570	0.516	710	0.059
435	0.150	575	0.531	715	0.051
440	0.235	580	0.545	720	0.043
445	0.384	585	0.556	725	0.037
450	0.569	590	0.563	730	0.032
455	0.570	595	0.567	735	0.027
460	0.407	600	0.565	740	0.023
465	0.308	605	0.557	745	0.020
470	0.252	610	0.544	750	0.017
475	0.200	615	0.524	755	0.015
480	0.179	620	0.500	760	0.013
485	0.189	625	0.471	765	0.011
490	0.211	630	0.440	770	0.010
495	0.242	635	0.407	775	0.009
500	0.279	640	0.372	780	0.008
505	0.312	645	0.338		
510	0.339	650	0.305		

Test Results: Goniometer

Results include unit flux, distribution, efficacy, and electrical power for sample number L19045.
Dialight unit model number RRE-4AC2-Jxxx-xxN

Electrical Measurements:

Input Voltage: 230 (VAC)
Input current: 1.031 (A)
Input Power: 230.9 (W)
Power Factor: 0.974

Photometric measurements:

Absolute Luminous Flux: 33362 (lumens)
Luminous Efficacy: 144.5 (lumens/W)

Intensity Summary:

<u>INTENSITY (CANDLEPOWER) SUMMARY</u>						
ANGLE	ALONG	25	45	72.5	ACROSS	OUTPUT LUMENS
0	23365	23365	23365	23365	23365	
5	20261	20592	21433	22562	23269	837
15	14151	14818	16544	18946	22523	4034
25	11633	11727	12271	15644	20887	6015
35	9938	10197	10433	11862	18198	7131
45	4971	6308	8316	8924	14645	7019
55	1032	1371	3629	6439	10488	4900
65	279	335	683	3140	5670	2479
75	140	148	167	343	1625	804
85	25	28	35	55	99	136
95	0	0	0	0	0	8
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

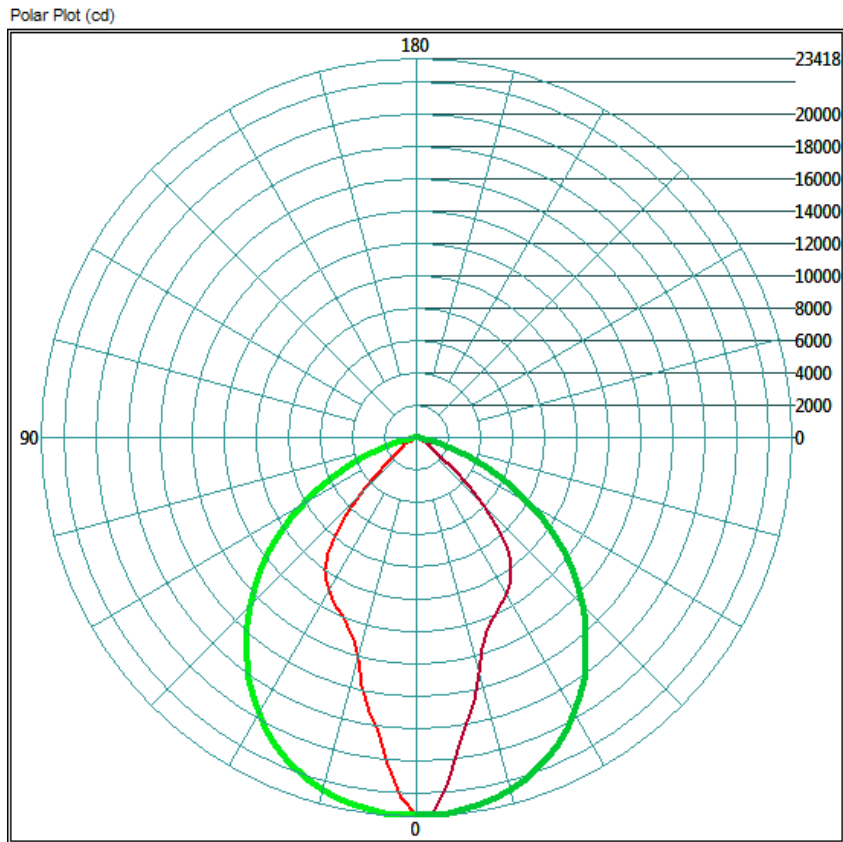
ZONAL LUMEN AND PERCENTAGES

ZONE	LUMENS	% LUMINAIRE
0-30	14362.69	43.1%
0-40	21668.62	65.0%
0-60	31439.64	94.2%
60-90	2608.31	7.8%
0-90	33361.73	100.0%
90-180	0	0.0%
0-180	33361.73	100.0%

Test Results: Goniometer

Results continued from previous page.

Polar Plot:

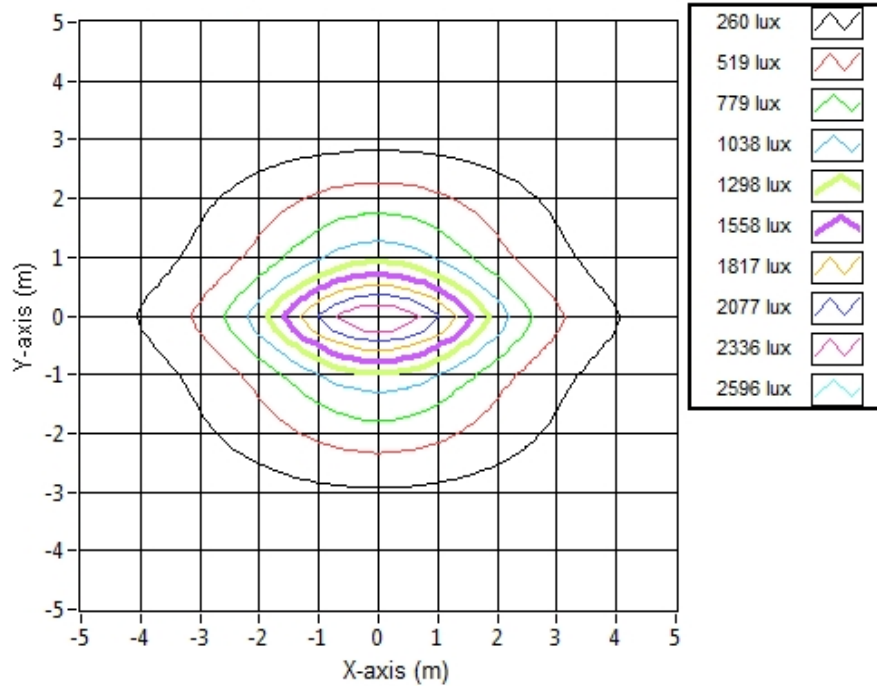


Test Results: Goniometer

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	2.91	7.89	2515.0
6.096	5.83	15.78	628.7
9.144	8.74	23.68	279.4
12.192	11.65	31.57	157.2
15.24	14.57	39.46	100.6
18.288	17.48	47.35	69.9
21.336	20.39	55.24	51.3
24.384	23.31	63.13	39.3
27.432	26.22	71.03	31.0
30.48	29.13	78.92	25.1

Test Results: In Situ Temperature Measurement Test

Results include maximum LED chip temperature for sample number L19045.
Dialight unit model number RRE-4AC2-Jxxx-xxN

LED identified as SOUL 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:

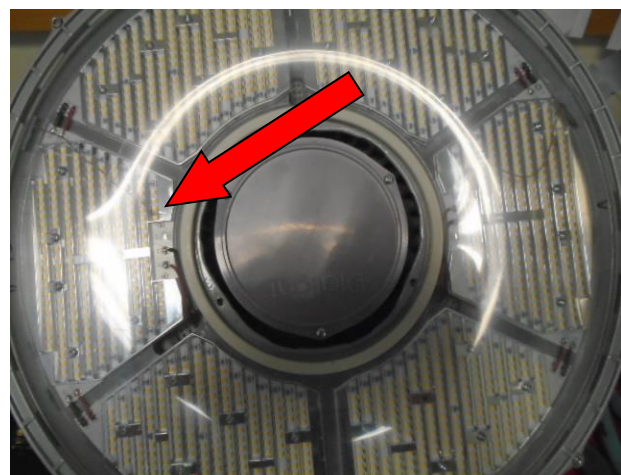
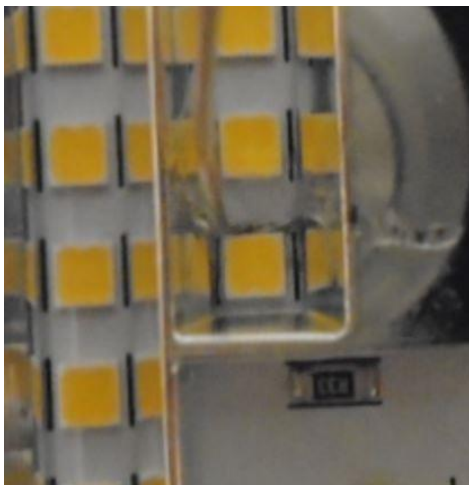
Maximum Power at Indicated Current: 0.21 (W)
Maximum Source Temperature: 121.4 (°C)

Test Conditions:

Temperature Measurement Location: See Photographs Below
Ambient Temperature: $25^{\circ} \pm 5^{\circ}$ (°C)
Ambient temperature at time of measurement: 24.2 (°C)
Relative humidity at time of measurement: 34%

Results:

Measured LED source temperature: 59.7 (°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.

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Approved Signatory