Dialight OPTICS LABORATORY

NVLAP Lab Code 201033-0

Test Report

Report Number: L16032 Date: Apr 18, 2016

Issued by:
Dialight Optics Laboratory
1501 Route 34 South, Farmingdale, NJ 07727

Test of one Vigilant Highbay With Ultra Clear Polycarbonate Lens
Unit manufacturer: Dialight Corporation
Unit model number: HE2MM4Kx-xxx

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 4, 2016 through April 9, 2016

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:	L16032
Manufacturer:	Dialight Corporation
Product Name:	Vigilant Highbay
Description:	Vigilant Highbay With Ultra Clear Polycarbonate Lens
Model Number:	HE2MM4Kx-xxx

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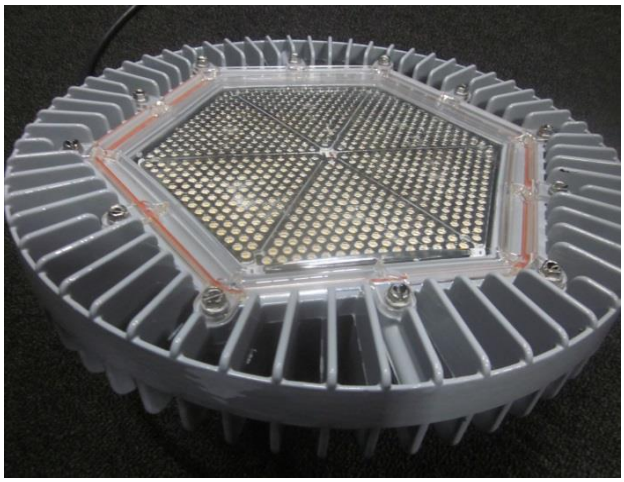
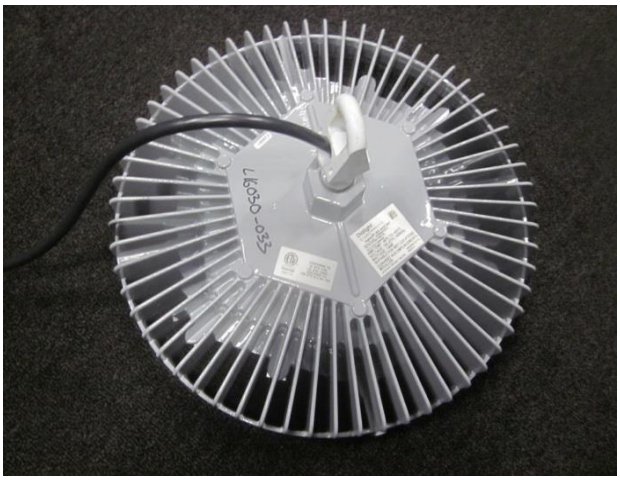
Report Summary

Sample number L16032
Dialight unit model number HE2MM4Kx-xxx

Photograph(s) of sample:





*Photographs not to scale. For reference only.

Summary of Results:

	Integrating Sphere	Goniophotometer
Luminous Flux:	16780 (lumens)	16676 (lumens)
Electrical Power:	143.4 (W)	143.5 (W)
Luminous Efficacy:	117.1 (lumens/W)	116.2 (lumens/W)

Electrical Measurements:

Input Power (120VAC):	143.4	(W)
Power Factor (120VAC):	0.995	
Current ATHD % (120VAC):	8.231	
Input Power (277VAC):	140.7	(W)
Power Factor (277VAC):	0.97	
Current ATHD % (277VAC):	13.71	

Color Measurements:

Correlated Color Temperature (CCT):	3962
Color Rendering Index (CRI):	82.6
Chromaticity Coordinate (x):	0.384
Chromaticity Coordinate (y):	0.385
Chromaticity Coordinate (u'):	0.224
Chromaticity Coordinate (v'):	0.337
DUV:	0.0028

Temperature Measurements:

In Situ LED Source Temperature:	54.8	(°C)

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Test Results: Integrating Sphere

Results include unit color, flux, efficacy and electrical power for sample number L16032.
Dialight unit model number HE2MM4Kx-xxx

Test Conditions:

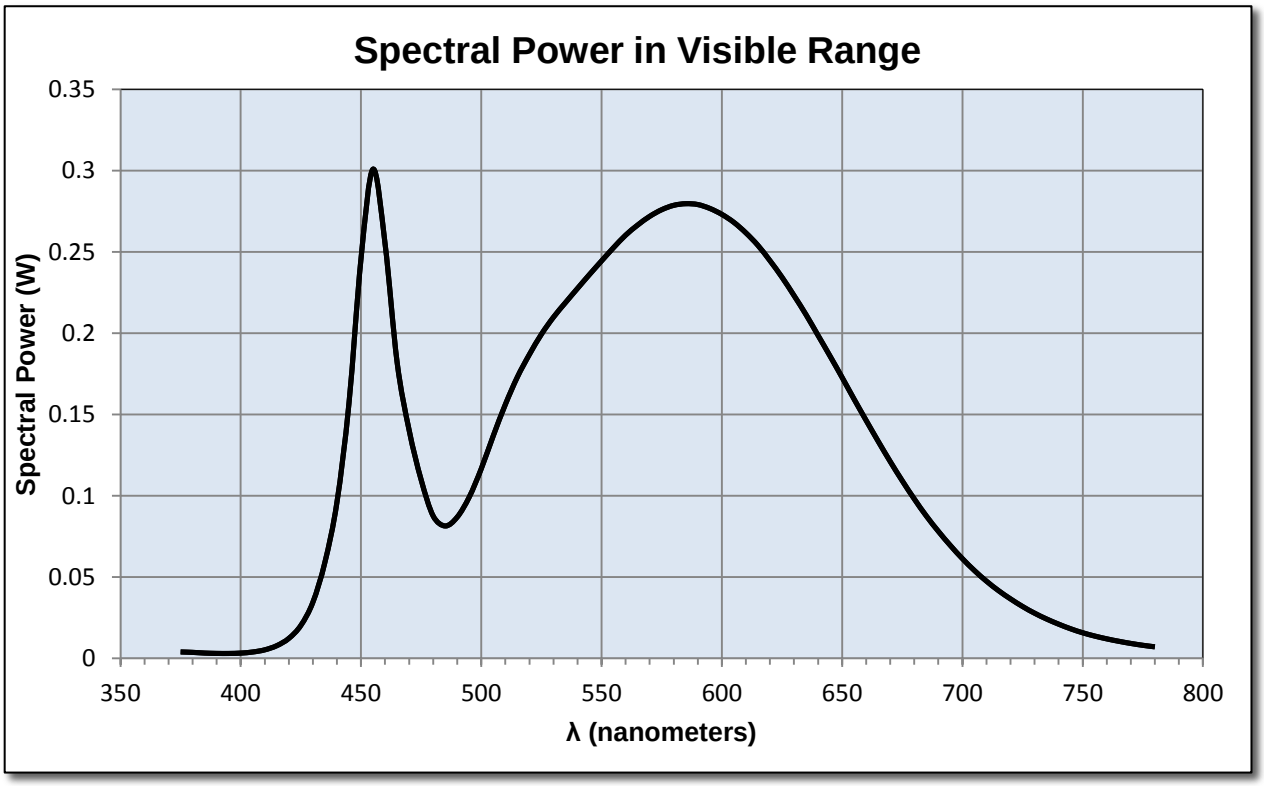
Ambient Temperature:	25 ± 1	(°C)

Electrical Measurements:

Input Voltage:	120	(VAC)
Input Current:	1.198	(A)
Input Power:	143.4	(W)
Input Power Factor:	0.995	
Current ATHD:	8.231	(%)

Photometric measurements:

Luminous Flux:	16780	(lumens)
Luminous Efficacy:	117.1	(lumens/W)
Correlated Color Temperature (CCT):	3962	(K)
CRI -Ra:	82.6	
CRI -R9:	19.1	
DUV:	0.0028	
CIE Coordinate (x):	0.384	
CIE Coordinate (y):	0.385	
CIE Coordinate (u'):	0.224	
CIE Coordinate (v'):	0.337	



Test Results: Integrating Sphere

Results continued from previous page.

Tabulated Spectral Power in Visible Range:

λ(nm)	(W/nm)	λ(nm)	(W/nm)	λ(nm)	(W/nm)
375	0.004	515	0.173	655	0.159
380	0.004	520	0.187	660	0.146
385	0.003	525	0.199	665	0.133
390	0.003	530	0.210	670	0.121
395	0.003	535	0.219	675	0.109
400	0.003	540	0.227	680	0.098
405	0.004	545	0.236	685	0.088
410	0.005	550	0.244	690	0.078
415	0.008	555	0.253	695	0.069
420	0.012	560	0.260	700	0.061
425	0.020	565	0.266	705	0.054
430	0.035	570	0.272	710	0.047
435	0.059	575	0.276	715	0.042
440	0.096	580	0.279	720	0.037
445	0.157	585	0.280	725	0.032
450	0.246	590	0.279	730	0.028
455	0.301	595	0.277	735	0.024
460	0.255	600	0.273	740	0.021
465	0.182	605	0.268	745	0.018
470	0.140	610	0.262	750	0.016
475	0.110	615	0.254	755	0.014
480	0.088	620	0.245	760	0.012
485	0.081	625	0.234	765	0.010
490	0.087	630	0.223	770	0.009
495	0.099	635	0.211	775	0.008
500	0.117	640	0.199	780	0.007
505	0.137	645	0.186		
510	0.156	650	0.173		

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Test Results: Goniometer

Results include unit flux, distribution, efficacy, and electrical power for sample number L16032.
Dialight unit model number HE2MM4Kx-xxx

Electrical Measurements:

Input Voltage:	120	(VAC)
Input current:	1.2	(A)
Input Power:	143.5	(W)
Power Factor:	0.995	

Photometric measurements:

Absolute Luminous Flux:	16676	(lumens)
Luminous Efficacy:	116.2	(lumens/W)

Intensity Summary:

INTENSITY (CANDLEPOWER) SUMMARY

ANGLE	ALONG	23	45	68	ACROSS	OUTPUT LUMENS
0	6193	6193	6193	6193	6193	
5	6373	6373	6373	6373	6373	236
15	6581	6581	6581	6581	6581	1388
25	7265	7265	7265	7265	7265	2793
35	7043	7043	7043	7043	7043	4125
45	5160	5160	5160	5160	5160	4287
55	2136	2136	2136	2136	2136	2779
65	487	487	487	487	487	904
75	40	40	40	40	40	144
85	8	8	8	8	8	19
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	

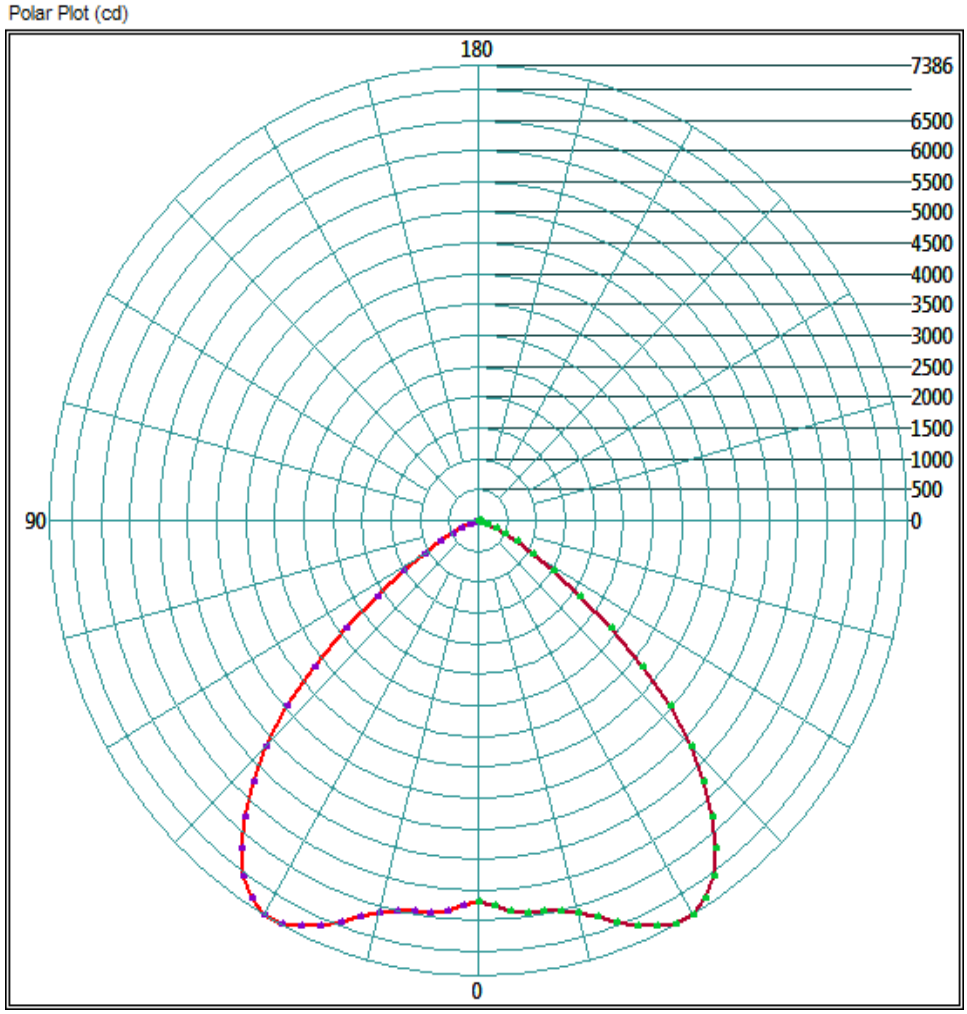
ZONAL LUMEN AND PERCENTAGES

ZONE	LUMENS	% LUMINAIRE
0-30	6363.04	38.2%
0-40	10763.52	64.5%
0-60	16213.76	97.2%
60-90	714.88	4.3%
0-90	16675.36	100.0%
90-180	0	0.0%
0-180	16675.36	100.0%

Test Results: Goniometer

Results continued from previous page.

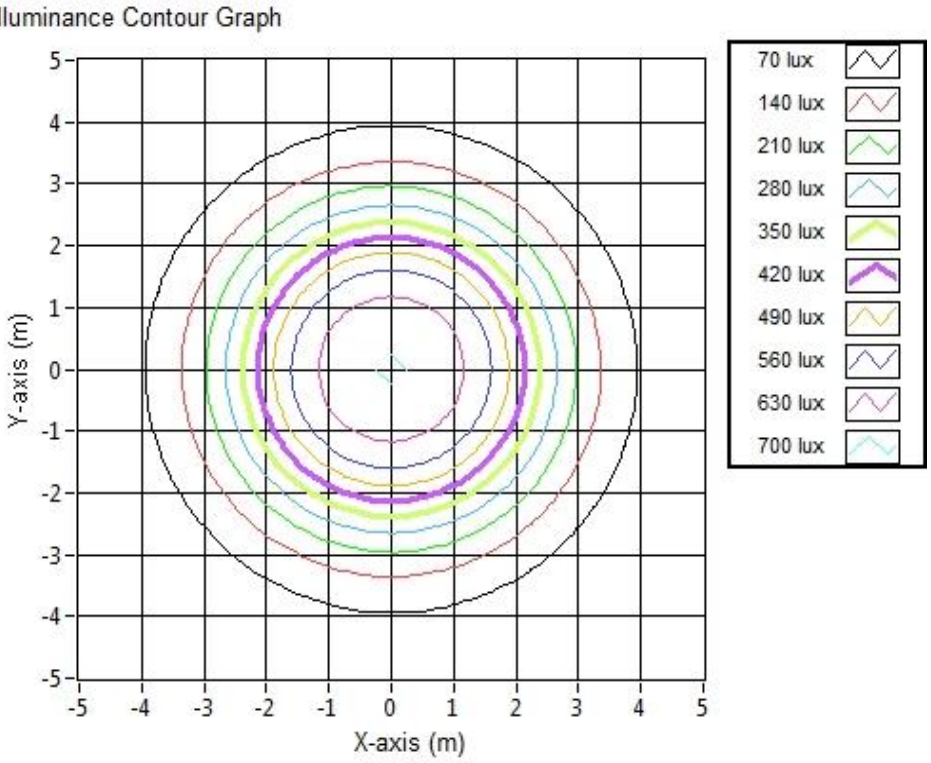
Polar Plot:



Test Results: Goniometer

Results continued from previous page.

Illuminance Plot:



Illuminance-Cone of Light:

Mounting Height (m)	Beam Cone Width (m)	Orthogonal Beam Cone Width (m)	Projected Illuminance (lux)
3.048	7.75	7.75	666.6
6.096	15.50	15.50	166.7
9.144	23.25	23.25	74.1
12.192	31.00	31.00	41.7
15.24	38.75	38.75	26.7
18.288	46.50	46.50	18.5
21.336	54.25	54.25	13.6
24.384	62.00	62.00	10.4
27.432	69.75	69.75	8.2
30.48	77.51	77.51	6.7

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Test Results: In Situ Temperature Measurement Test

Results include maximum LED chip temperature for sample number L16032.
Dialight unit model number HE2MM4Kx-xxx

LED identified as Nichia part number NT2W757DT.

LED drive current (as indicated by customer): 100 (mA)

LED Specifications:

LED specifications are taken from LED manufacturer datasheet:

Maximum Forward Current (If):	300	(mA)
Maximum Rated Power Dissipation:	1.05	(W)
Maximum Junction Temp. (Tj):	120	(°C)
Thermal Resistance (Rth):	18	(°C/W)

Derived Specifications:

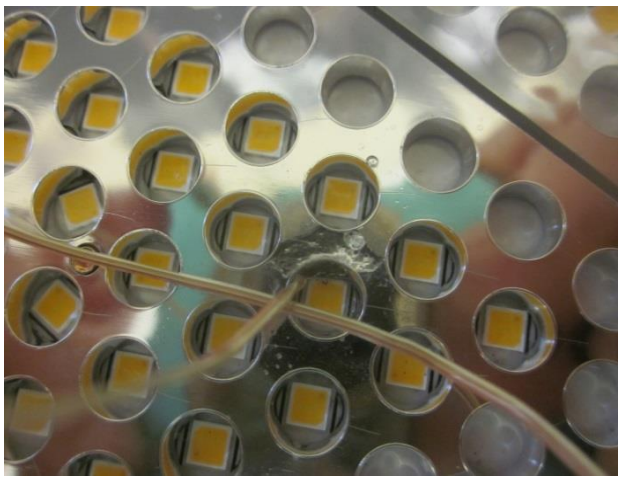
Maximum Power at Indicated Current:	0.35	(W)
Maximum Source Temperature:	113.7	(°C)

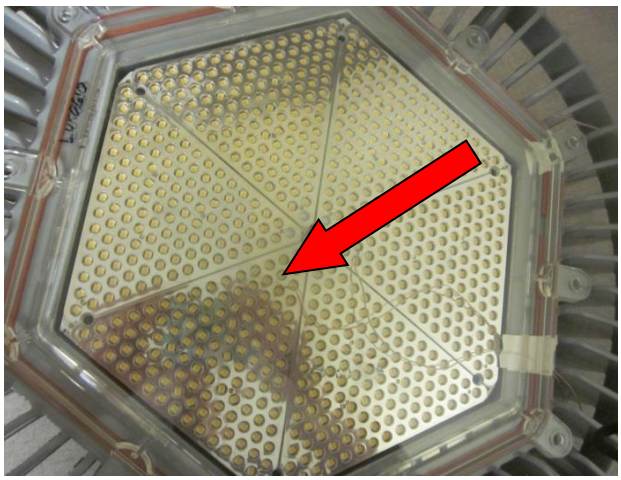
Test Conditions:

Temperature Measurement Location:	See Photographs Below	
Ambient Temperature:	25° ± 5‘	(°C)
Ambient temperature at time of measurement:	23.6	(°C)
Relative humidity at time of measurement:	20%	

Results:

Measured LED source temperature: 54.8 (°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
Volttech Power Analyzer	PM1000+
Delta Elektronika DC Power Supply	SM.300-5
Elgar AC Power Supply	CW1251P
Instek AC Power Supply	APS-9501
Sorensen DC Power Supply	XHR150-7
Extech Hygro-Thermometer	4/16/3120
Extech Hygro-Thermometer	4/16/3120
Fluke 52II Thermometer	52II Thermometer
Volttech Power Analyzer	PM1000+
BK Precison	1715A
TDK-Lambda	GEN1500W
Fluke 8808A Digit Multimeter	8808A
TPI Digitial Thermometer 343	TPI 343
TPI Digitial Thermometer 343	TPI 343
Step-Up Transformer	
Omega TC	Dpi8-C24
Agilent True RMS OLED Multimeter	U1273A
Adaptive Power Systems AC Power Supply	FC-210
Xitron Power Analyzer	XT2640

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.

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