Dialight OPTICS LABORATORY

NVLAP Lab Code 201033-0

Test Report

Report Number: L16028 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: HE2MM4Px-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 5, 2016 through April 11, 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:	L16028
Manufacturer:	Dialight Corporation
Product Name:	Vigilant Highbay
Description:	Vigilant Highbay With Ultra Clear Polycarbonate Lens
Model Number:	HE2MM4Px-xxx

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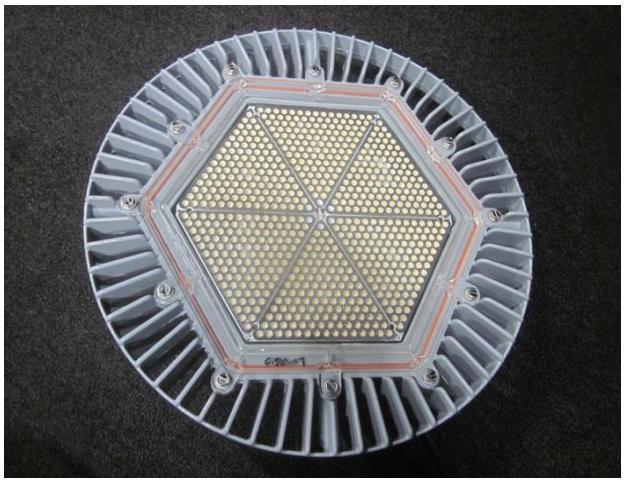
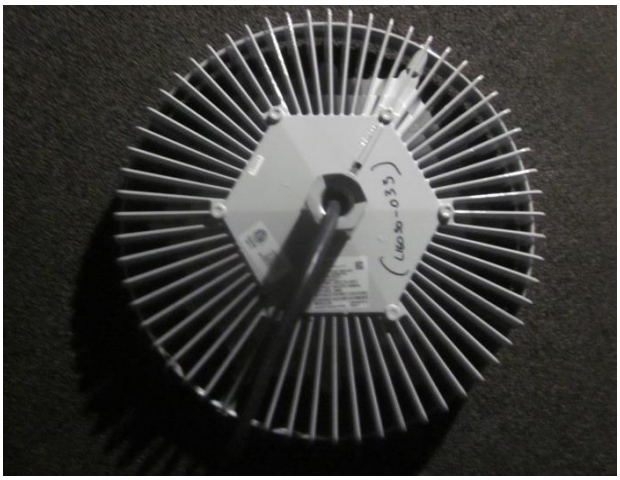
Report Summary

Sample number L16028
Dialight unit model number HE2MM4Px-xxx

Photograph(s) of sample:





*Photographs not to scale. For reference only.

Summary of Results:

	Integrating Sphere	Goniophotometer
Luminous Flux:	24500 (lumens)	24385 (lumens)
Electrical Power:	212.8 (W)	212.4 (W)
Luminous Efficacy:	115.2 (lumens/W)	114.8 (lumens/W)

Electrical Measurements:

Input Power (120VAC):	212.8	(W)
Power Factor (120VAC):	0.996	
Current ATHD % (120VAC):	5.777	
Input Power (277VAC):	205.1	(W)
Power Factor (277VAC):	0.965	
Current ATHD % (277VAC):	12.3	

Color Measurements:

Correlated Color Temperature (CCT):	3990
Color Rendering Index (CRI):	83.1
Chromaticity Coordinate (x):	0.383
Chromaticity Coordinate (y):	0.384
Chromaticity Coordinate (u'):	0.224
Chromaticity Coordinate (v'):	0.337
DUV:	0.0025

Temperature Measurements:

In Situ LED Source Temperature:	60.2	(°C)

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Test Results: Integrating Sphere

Results include unit color, flux, efficacy and electrical power for sample number L16028.
Dialight unit model number HE2MM4Px-xxx

Test Conditions:

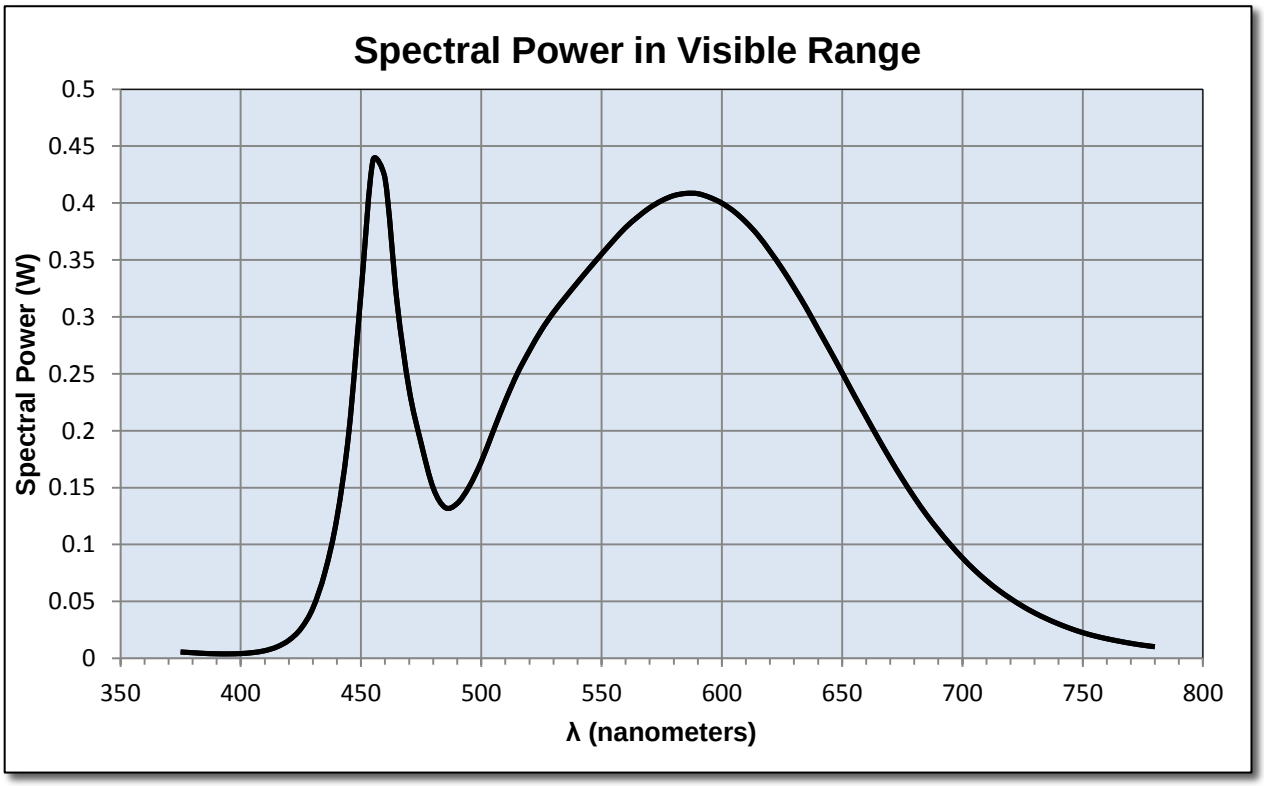
Ambient Temperature:	25 ± 1	(°C)

Electrical Measurements:

Input Voltage:	120	(VAC)
Input Current:	1.78	(A)
Input Power:	212.8	(W)
Input Power Factor:	0.996	
Current ATHD:	5.777	(%)

Photometric measurements:

Luminous Flux:	24500	(lumens)
Luminous Efficacy:	115.2	(lumens/W)
Correlated Color Temperature (CCT):	3990	(K)
CRI -Ra:	83.1	
CRI -R9:	19.4	
DUV:	0.0025	
CIE Coordinate (x):	0.383	
CIE Coordinate (y):	0.384	
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	0.006	515	0.250	655	0.231
380	0.005	520	0.270	660	0.212
385	0.004	525	0.288	665	0.193
390	0.004	530	0.304	670	0.175
395	0.004	535	0.317	675	0.158
400	0.004	540	0.330	680	0.141
405	0.005	545	0.343	685	0.126
410	0.007	550	0.355	690	0.113
415	0.010	555	0.367	695	0.100
420	0.016	560	0.378	700	0.088
425	0.026	565	0.388	705	0.078
430	0.044	570	0.396	710	0.068
435	0.076	575	0.402	715	0.060
440	0.123	580	0.407	720	0.053
445	0.200	585	0.408	725	0.046
450	0.321	590	0.408	730	0.040
455	0.438	595	0.405	735	0.035
460	0.421	600	0.400	740	0.030
465	0.313	605	0.393	745	0.026
470	0.236	610	0.383	750	0.023
475	0.189	615	0.372	755	0.020
480	0.150	620	0.358	760	0.017
485	0.132	625	0.343	765	0.015
490	0.136	630	0.326	770	0.013
495	0.151	635	0.308	775	0.012
500	0.173	640	0.289	780	0.010
505	0.200	645	0.270		
510	0.226	650	0.251		

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Test Results: Goniometer

Results include unit flux, distribution, efficacy, and electrical power for sample number L16028.
Dialight unit model number HE2MM4Px-xxx

Electrical Measurements:

Input Voltage:	120	(VAC)
Input current:	1.77	(A)
Input Power:	212.4	(W)
Power Factor:	0.996	

Photometric measurements:

Absolute Luminous Flux:	24385	(lumens)
Luminous Efficacy:	114.8	(lumens/W)

Intensity Summary:

INTENSITY (CANDLEPOWER) SUMMARY

ANGLE	ALONG	23	45	68	ACROSS	OUTPUT LUMENS
0	1	1	1	1	1	
5	14	14	14	14	14	344
15	43	43	43	43	43	2039
25	78	78	78	78	78	4135
35	102	102	102	102	102	6078
45	90	90	90	90	90	6220
55	43	43	43	43	43	3954
65	12	12	12	12	12	1366
75	1	1	1	1	1	216
85	0	0	0	0	0	30
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	

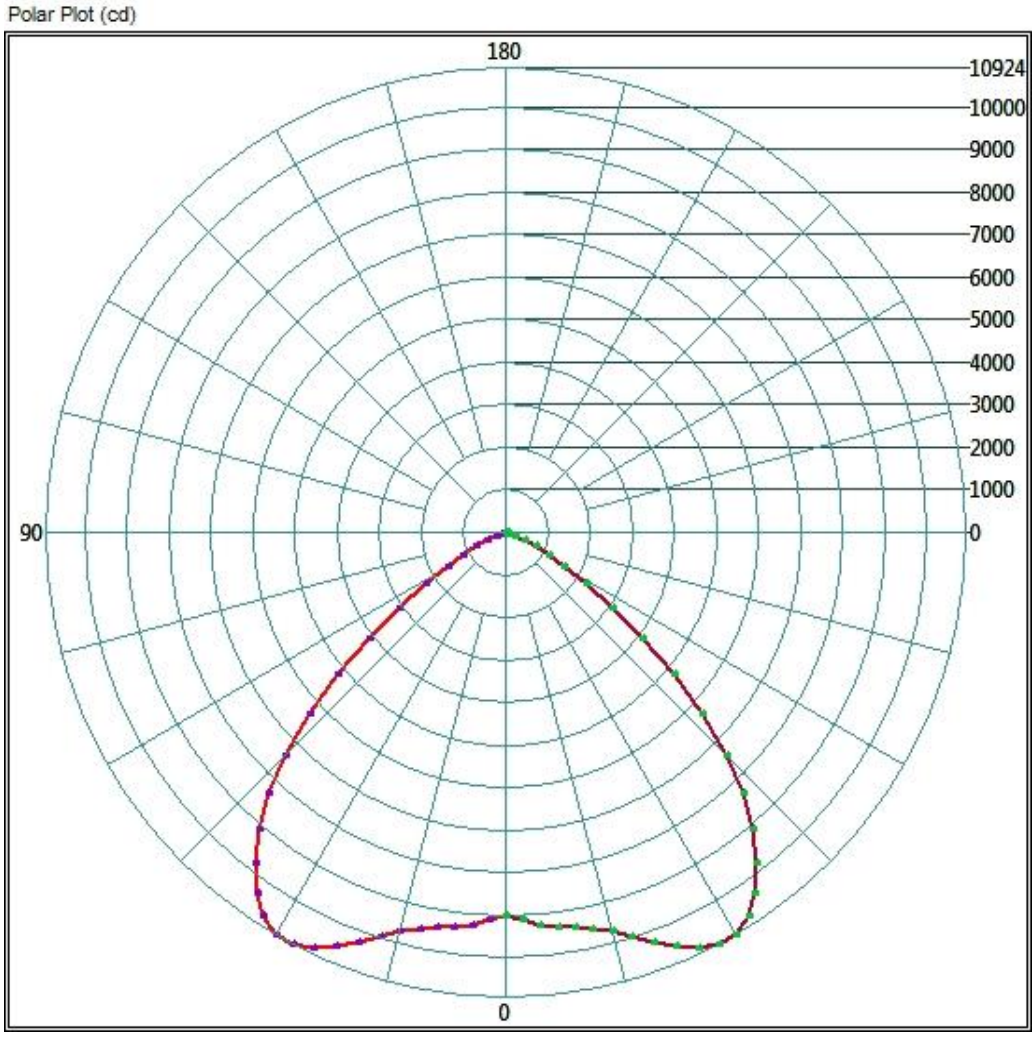
ZONAL LUMEN AND PERCENTAGES

ZONE	LUMENS	% LUMINAIRE
0-30	9395.52	38.5%
0-40	15836.8	64.9%
0-60	23672.96	97.1%
60-90	1093.6	4.5%
0-90	24384.8	100.0%
90-180	0	0.0%
0-180	24384.8	100.0%

Test Results: Goniometer

Results continued from previous page.

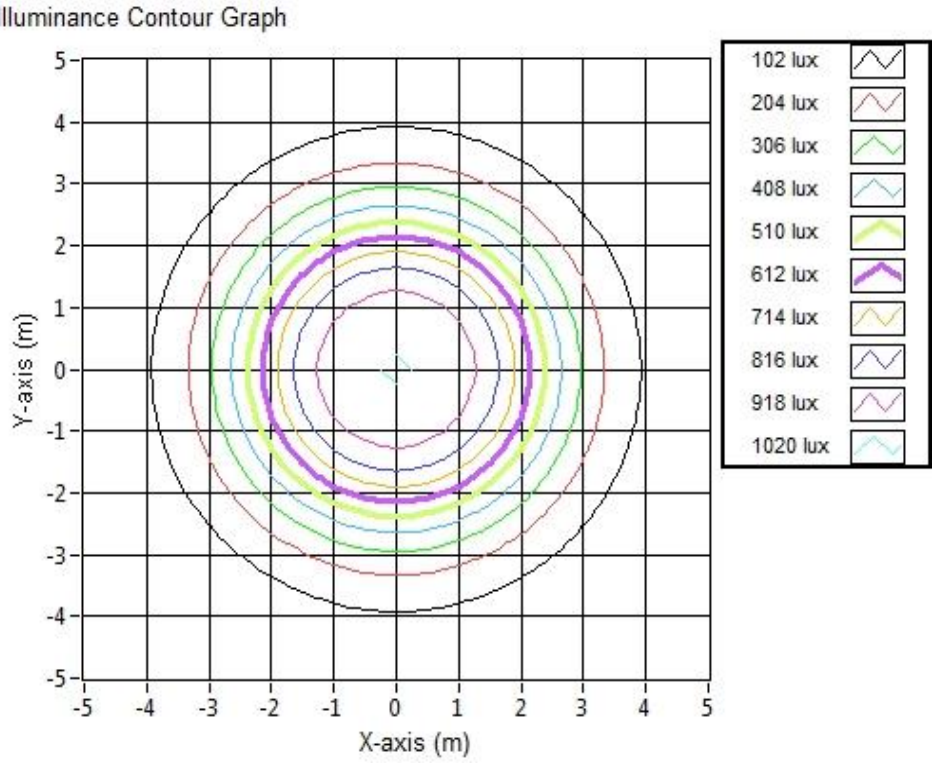
Polar Plot:



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	7.68	7.68	972.2
6.096	15.35	15.35	243.0
9.144	23.03	23.03	108.0
12.192	30.71	30.71	60.8
15.24	38.39	38.39	38.9
18.288	46.06	46.06	27.0
21.336	53.74	53.74	19.8
24.384	61.42	61.42	15.2
27.432	69.10	69.10	12.0
30.48	76.77	76.77	9.7

Test Results: In Situ Temperature Measurement Test

Results include maximum LED chip temperature for sample number L16028.
Dialight unit model number HE2MM4Px-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:

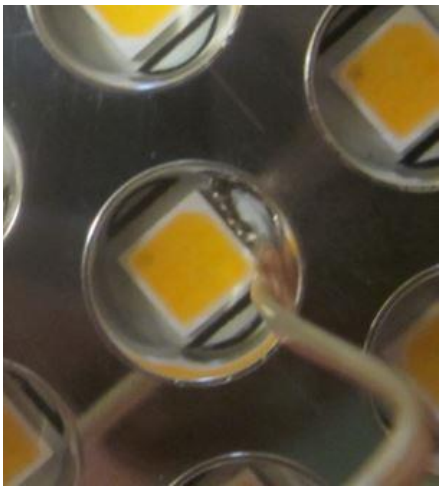
Maximum Power at Indicated Current:	0.35	(W)
Maximum Source Temperature:	113.7	(°C)

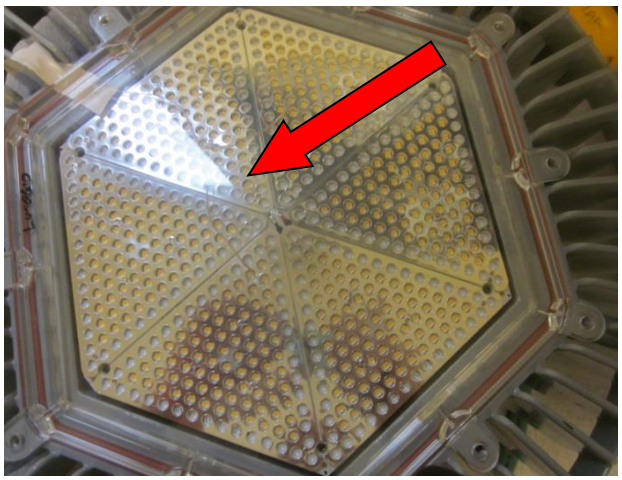
Test Conditions:

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

Results:

Measured LED source temperature:	60.2	(°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