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THE LIGHT CENTER OF THE INDUSTRY SINCE 1955
INDEPENDENT TESTING LABORATORIES, INC.
4066 CAMELOT CIRCLE, LONGMONT, CO 80504 USA
PHONE: (303)442-1255 • FAX: (970)535-3114 • E-MAIL: itl@itlboulder.com • WEBSITE: www.itlboulder.com

NVLAP LAB CODE: 200925-0

REPORT NUMBER: ITL89606-SPHERE
DATE: 09/20/17
PREPARED FOR: THE FLAG COMPANY INC.
CATALOG NUMBER: FLAGPOLE BEACON (DOWN LIGHTING SYSTEM)

ADDRESS: 3600 CANTRELL INDUSTRIAL COURT
ACWORTH, GA 30101

LUMINAIRE: CAST DIFFUSE METAL MOUNTING BASE, SPUN BRASS COLORED SPHERICAL METAL HOUSING, 2-PIECE MOLDED BLACK PLASTIC LAMP MOUNTING FRAME.

LAMP: TWO 4-WATT MR-16 STYLE GU-5.3 BASE LED LAMPS, DAUER LED LED-MR16-4XBD-WW-40, AIMED 35-DEGREES BELOW THE HORIZON.

NOTE: DATA SHOWN IS ABSOLUTE FOR THE SAMPLE PROVIDED AT RATED INPUT VOLTAGE (12VDC) TO THE LAMPS.

INSTRUMENTS:		Calibration Due:
	Agilent Technologies N5770A DC Power Supply	N/A
	Yokogawa WT210 Digital Power Meter #6	12/20/17
	Ocean Optics QE65000 Spectroradiometer	09/11/18
	ITL 2.0m Diameter Integrating Sphere S20-1, 4PI Geometry	09/11/18
	Omega HH802U Digital Thermometer #5	12/08/17

OBJECT OF TEST: Measure the Absolute Flux in lumens*, Spectral Power Distribution (SPD), Correlated Color Temperature (CCT), Color Rendering Index (CRIa,1-14), Chromaticity Coordinates (x,y; u',v'), ANSI C78.377 Duv, Total Radiant Flux*, Scotopic / Photopic Lumen Ratio, and electrical data to the test sample.

PROCEDURE: The test sample was provided by the customer and had an unknown number of operating hours. The test sample was mounted inside the integrating sphere and allowed to stabilize. After stabilization occurred, measurements were taken. In order to measure mean performance, multiple data sets were recorded and averaged. Readings were taken with the test sample operating at 12VDC input in a 25 +/-1 degree Celsius free air ambient and in accordance with IESNA LM-79-08. All data are traceable to the National Institute of Standards and Technology.

RESULTS: (continued subsequent pages)

THIS ITL REPORT WITH THE USE OF THE NVLAP LOGO SHALL NOT BE USED BY THE CLIENT TO CLAIM PRODUCT CERTIFICATION, APPROVAL, OR ENDORSEMENT BY NVLAP, NIST, OR ANY AGENCY OF THE FEDERAL GOVERNMENT.

Checked *N WHITE*
Approved *P O'CONNOR*
Sphere Lab Supervisor

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RESULTS:

PHOTOMETRIC	
Total Integrated Flux (lumens)	586 *
SPECTRORADIOMETRIC	
Observer	CIE 1931 2 degree
Chromaticity Ordinate x	0.4387
Chromaticity Ordinate y	0.4094
Observer	CIE 1976 2 degree
Chromaticity Ordinate u'	0.2494
Chromaticity Ordinate v'	0.5237
Correlated Color Temp CCT (K)	3014
ANSI C78.377-2015 Duv	0.002
Total Radiant Flux (milliWatts)	1766 *
Scotopic / Photopic Lumen Ratio	1.293
ELECTRICAL	
Input Voltage (Volts DC)	12.0
Input Current (Amps DC)	0.651
Input Power (Watts)	7.81
EFFICACY (lumens/Watt)	75.0

COLOR RENDERING INDICES	CRI
Ra (Average 1-8)	78
R1 Light greyish red	76
R2 Dark greyish yellow	84
R3 Strong yellowish green	92
R4 Moderate yellowish green	78
R5 Light bluish green	76
R6 Light blue	80
R7 Light violet	84
R8 Light reddish purple	58
R9 Strong red	-1
R10 Strong yellow	64
R11 Strong green	76
R12 Strong blue	60
R13 Light yellowish pink (skin)	77
R14 Moderate olive green (leaf)	95

*NOTE: The total lumen output shown on this report was obtained from photometric test ITL89606-GONIOPHOTOMETRY

Proper calibration of integrating spheres for measuring total flux output of non-directional samples will produce reliable, repeatable results within the calibration tolerances of the equipment used. However, measurement of test samples with significant self absorption and/or directional output, even when these effects are compensated for, are likely to have a greater variation in results compared to the flux output calculated from a goniophotometric exploration since these artifacts do not affect the goniophotometric results.

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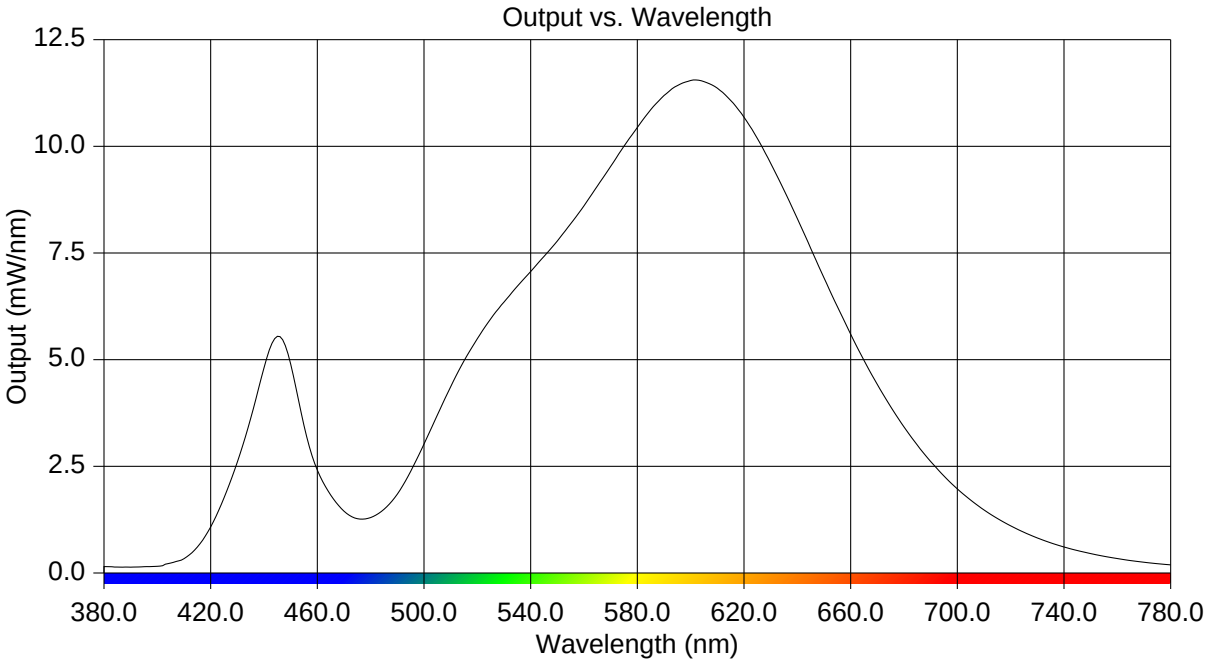
RESULTS:

Wavelength	mW per nm	Wavelength	mW per nm	Wavelength	mW per nm
380	0.150	515	4.972	650	6.918
385	0.139	520	5.491	655	6.246
390	0.137	525	5.955	660	5.597
395	0.148	530	6.350	665	4.984
400	0.157	535	6.721	670	4.419
405	0.233	540	7.066	675	3.898
410	0.335	545	7.420	680	3.423
415	0.608	550	7.781	685	2.998
420	1.079	555	8.185	690	2.613
425	1.760	560	8.606	695	2.273
430	2.600	565	9.068	700	1.971
435	3.622	570	9.530	705	1.709
440	4.808	575	10.004	710	1.478
445	5.547	580	10.442	715	1.279
450	4.898	585	10.857	720	1.105
455	3.455	590	11.191	725	0.954
460	2.412	595	11.422	730	0.821
465	1.828	600	11.543	735	0.707
470	1.449	605	11.516	740	0.610
475	1.273	610	11.363	745	0.527
480	1.299	615	11.076	750	0.455
485	1.493	620	10.682	755	0.392
490	1.848	625	10.185	760	0.339
495	2.381	630	9.603	765	0.291
500	3.022	635	8.974	770	0.252
505	3.701	640	8.307	775	0.218
510	4.364	645	7.611	780	0.191



THIS REPORT IS BASED ON PUBLISHED INDUSTRY PROCEDURES. FIELD PERFORMANCE MAY DIFFER FROM LABORATORY PERFORMANCE.

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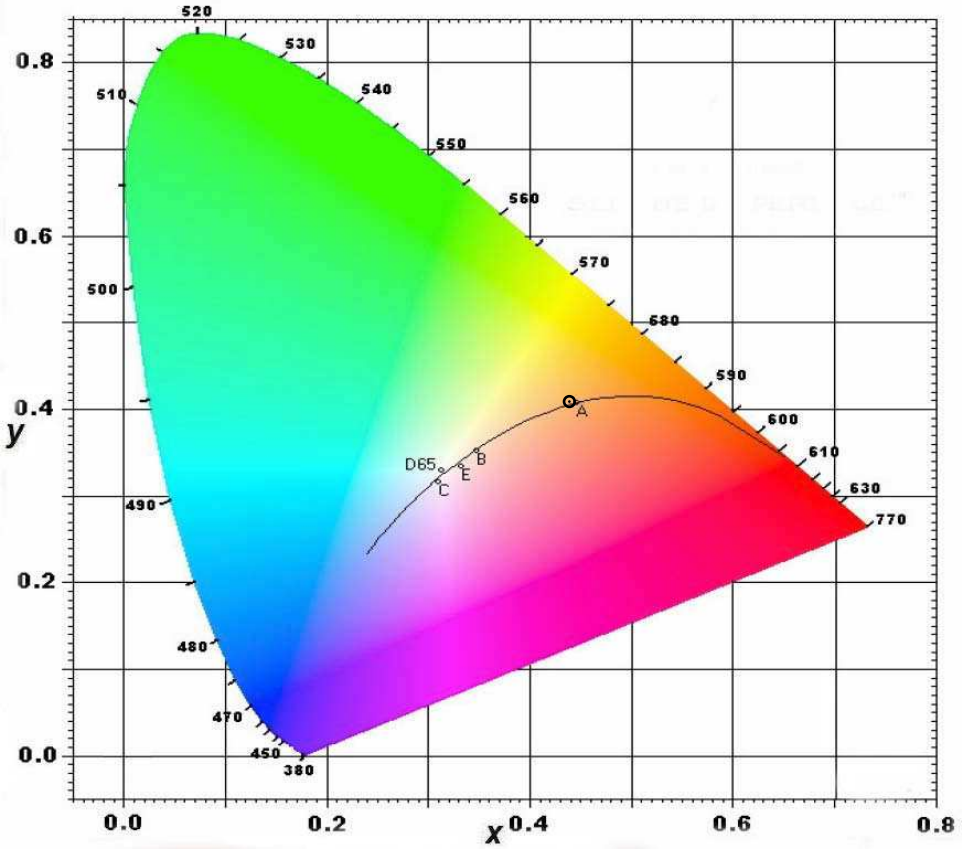
CIE Chromaticity Diagram



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