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THE LIGHT CENTER OF THE INDUSTRY SINCE 1955

NVLAP LAB CODE: 200925-0

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

REPORT NUMBER: ITL87050-SPHERE
DATE: 04/29/16
PREPARED FOR: TEKA ILLUMINATION, INC.
CATALOG NUMBER: CLP-LED-e93, ZPL-LED-e93, CLW-LED-e93, SSW-LED-e93, 1130-LED-e93, HRW-LED-e93

ADDRESS: 40429 BRICKYARD DRIVE
MADERA, CA 93636-9515

LUMINAIRE: FABRICATED COPPER COLORED METAL MOUNTING STEM WITH SPUN COPPER COLORED METAL REFLECTOR, CAST BRASS COLORED METAL HEAT SINK MOUNTING BASE AND TOP FINIAL ATTACHED TO BASE WITH 4 FABRICATED BRASS COLORED METAL POSTS, MACHINED BLACK FINISHED METAL HEAT SINK, 1 CIRCUIT BOARD WITH 3 LEDS, FROSTED HOLOGRAPHIC CYLINDRICAL GLASS LENS, CAST BRASS COLORED LENS MOUNTING COLLAR. LENS FROSTED SIDE IN.

LAMP: THREE WHITE LIGHT EMITTING DIODES (LEDS), VERTICAL BASE-DOWN POSITION.

DRIVER: B-K LIGHTING 524439/400188-L-L, DRIVER HAS MULTIPLE LEADS, ONLY LINE INPUT AND LED OUTPUT LEADS CONNECTED FOR THIS TEST.

NOTE: DATA SHOWN IS ABSOLUTE FOR THE SAMPLE PROVIDED AT RATED INPUT VOLTAGE (12VAC, 60Hz) TO THE DRIVER.

INSTRUMENTS:

	Calibration Due:
Associated Power Technologies APT5040 AC Power Source	N/A
Yokogawa WT210 Digital Power Meter #6	12/07/16
Ocean Optics QE65000 Spectroradiometer	12/14/16
ITL 2.0m Diameter Integrating Sphere S20-2, 4PI Geometry	12/14/16

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 including ANSI C82.77-2002 Power Factor (PF) and Total Harmonic Distortion (THD) 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 12VAC 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)	188 *
SPECTRORADIOMETRIC	
Observer	CIE 1931 2 degree
Chromaticity Ordinate x	0.5042
Chromaticity Ordinate y	0.4076
Observer	CIE 1976 2 degree
Chromaticity Ordinate u'	0.2930
Chromaticity Ordinate v'	0.5330
Correlated Color Temp CCT (K)	2163
ANSI C78.377-2008 Duv	-0.002
Total Radiant Flux (milliWatts)	619 *
Scotopic / Photopic Lumen Ratio	1.003
ELECTRICAL	
Input Voltage (Volts AC)	12.0
Input Current (Amps AC)	0.479
Input Power (Watts)	5.15
Input Power Factor (%)	89.6
Input Current THD (%)	47.6
Input Voltage THD (%)	1.5
EFFICACY (lumens/Watt)	36.5

COLOR RENDERING INDICES	CRI
Ra (Average 1-8)	79
R1 Light greyish red	77
R2 Dark greyish yellow	91
R3 Strong yellowish green	92
R4 Moderate yellowish green	76
R5 Light bluish green	78
R6 Light blue	93
R7 Light violet	75
R8 Light reddish purple	48
R9 Strong red	-2
R10 Strong yellow	82
R11 Strong green	76
R12 Strong blue	83
R13 Light yellowish pink (skin)	80
R14 Moderate olive green (leaf)	97

*NOTE: 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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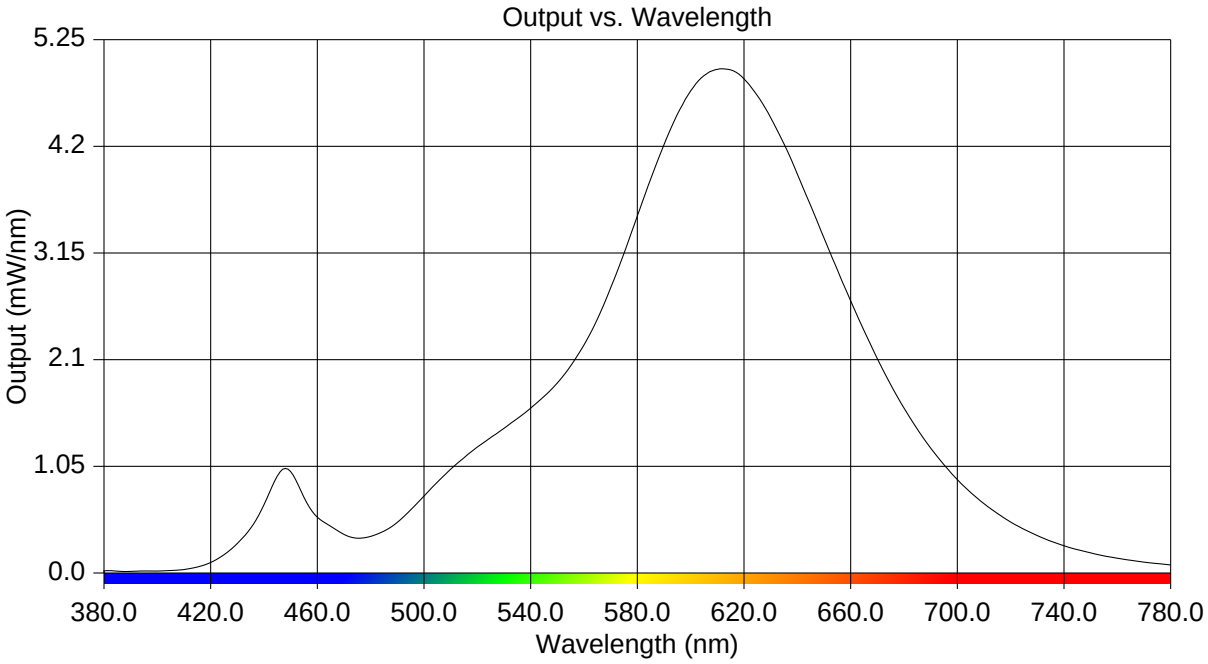
RESULTS:

Wavelength	mW per nm	Wavelength	mW per nm	Wavelength	mW per nm
380	0.021	515	1.134	650	3.298
385	0.018	520	1.240	655	2.986
390	0.016	525	1.333	660	2.679
395	0.020	530	1.424	665	2.387
400	0.019	535	1.520	670	2.110
405	0.025	540	1.623	675	1.855
410	0.034	545	1.738	680	1.624
415	0.059	550	1.871	685	1.416
420	0.103	555	2.039	690	1.229
425	0.180	560	2.245	695	1.066
430	0.291	565	2.498	700	0.920
435	0.441	570	2.808	705	0.792
440	0.672	575	3.146	710	0.682
445	0.955	580	3.515	715	0.587
450	0.998	585	3.877	720	0.501
455	0.744	590	4.216	725	0.430
460	0.550	595	4.515	730	0.368
465	0.460	600	4.746	735	0.314
470	0.380	605	4.896	740	0.268
475	0.342	610	4.958	745	0.230
480	0.360	615	4.953	750	0.198
485	0.412	620	4.864	755	0.168
490	0.499	625	4.700	760	0.145
495	0.621	630	4.482	765	0.125
500	0.757	635	4.224	770	0.107
505	0.894	640	3.927	775	0.093
510	1.022	645	3.617	780	0.079



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CIE Chromaticity Diagram