

**itl boulder**

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](mailto:itl@itlboulder.com) • WEBSITE: [www.itlboulder.com](http://www.itlboulder.com)

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REPORT NUMBER: ITL87051-SPHERE  
DATE: 04/29/16  
PREPARED FOR: TEKA ILLUMINATION, INC.  
CATALOG NUMBER: CLP-LED-e94, ZPL-LED-e94, CLW-LED-e94, SSW-LED-e94,  
1130-LED-e94, HRW-LED-e94

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:	Associated Power Technologies APT5040 AC Power Source	Calibration Due: 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)

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FEDERAL GOVERNMENT.

Checked	<u>N WHITE</u>
Approved	<u>P O'CONNOR</u> Sphere Lab Supervisor

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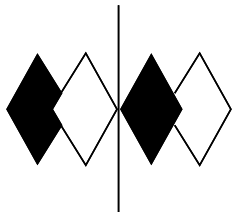
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**RESULTS:**

PHOTOMETRIC	
Total Integrated Flux (lumens)	188 *
SPECTORADIOMETRIC	
Observer	CIE 1931 2 degree
Chromaticity Ordinate x	0.4827
Chromaticity Ordinate y	0.4082
Observer	CIE 1976 2 degree
Chromaticity Ordinate u'	0.2785
Chromaticity Ordinate v'	0.5299
Correlated Color Temp CCT (K)	2392
ANSI C78.377-2008 Duv	-0.002
Total Radiant Flux (milliWatts)	600 *
Scotopic / Photopic Lumen Ratio	1.115
ELECTRICAL	
Input Voltage (Volts AC )	12.0
Input Current (Amps AC )	0.491
Input Power (Watts)	5.28
Input Power Factor (%)	89.6
Input Current THD (%)	47.9
Input Voltage THD (%)	1.2
EFFICACY (lumens/Watt)	35.6

COLOR RENDERING INDICES	CRI
Ra (Average 1-8)	80
R1 Light greyish red	78
R2 Dark greyish yellow	91
R3 Strong yellowish green	95
R4 Moderate yellowish green	77
R5 Light bluish green	79
R6 Light blue	91
R7 Light violet	78
R8 Light reddish purple	52
R9 Strong red	2
R10 Strong yellow	80
R11 Strong green	77
R12 Strong blue	78
R13 Light yellowish pink (skin)	81
R14 Moderate olive green (leaf)	98

\*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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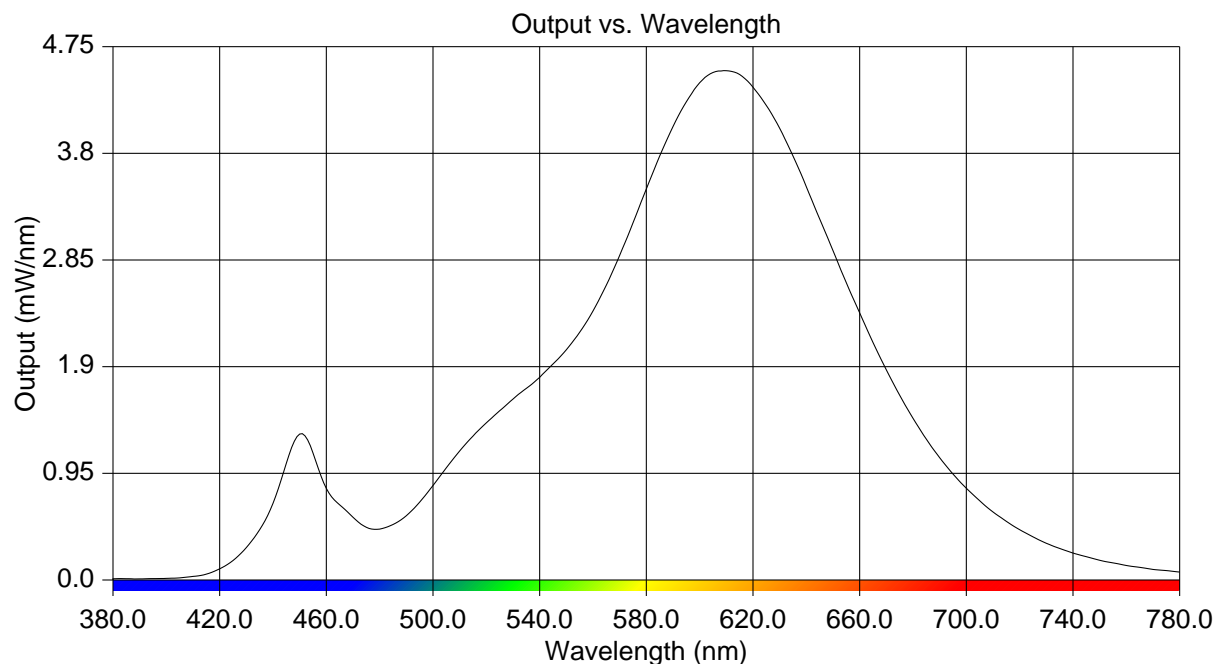
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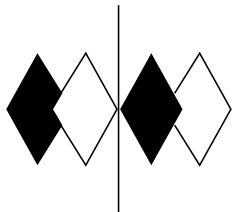
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#### RESULTS:

Wavelength	mW per nm	Wavelength	mW per nm	Wavelength	mW per nm
380	0.011	515	1.282	650	2.934
385	0.011	520	1.400	655	2.647
390	0.010	525	1.507	660	2.379
395	0.012	530	1.611	665	2.115
400	0.014	535	1.707	670	1.872
405	0.019	540	1.805	675	1.646
410	0.032	545	1.924	680	1.440
415	0.052	550	2.050	685	1.255
420	0.100	555	2.206	690	1.089
425	0.173	560	2.396	695	0.944
430	0.289	565	2.626	700	0.817
435	0.448	570	2.891	705	0.706
440	0.683	575	3.181	710	0.606
445	1.040	580	3.482	715	0.522
450	1.300	585	3.776	720	0.448
455	1.131	590	4.038	725	0.384
460	0.816	595	4.259	730	0.327
465	0.669	600	4.429	735	0.281
470	0.559	605	4.520	740	0.240
475	0.470	610	4.536	745	0.208
480	0.453	615	4.502	750	0.176
485	0.494	620	4.389	755	0.152
490	0.572	625	4.226	760	0.129
495	0.693	630	4.023	765	0.113
500	0.841	635	3.776	770	0.094
505	0.999	640	3.502	775	0.084
510	1.149	645	3.216	780	0.071





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## CIE Chromaticity Diagram

