itl boulder
THE LIGHT CENTER OF THE INDUSTRY SINCE 1955

NVLAP TESTING
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: ITL REPORT NUMBER
DATE: 01/01/??
PREPARED FOR: ABC LIGHTING
CATALOG NUMBER: LED SAMPLE SPHERE REPORT

ADDRESS: 123 Anystreet Way, Anytown, Anystate, 00000 USA

LUMINAIRE: 2X2 RECESSED PANEL

LAMP: DISCRETE LEDS

DRIVER: LED DRIVER COMPANY CATALOG NUMBER A1

NOTE: DATA SHOWN IS ABSOLUTE FOR THE SAMPLE PROVIDED AT RATED INPUT VOLTAGE (120VAC , 60Hz) TO THE TEST SAMPLE.

INSTRUMENTS:

	Calibration Due:
Associated Power Technologies APT5040 AC Power Source	N/A
Yokogawa WT210 Digital Power Meter #6	11/30/??
Ocean Optics QE65000 Spectroradiometer	07/14/??
ITL 2.0m Diameter Integrating Sphere S20-2, 4PI Geometry	07/14/??
Omega HH802U Digital Thermometer #8	09/25/??

OBJECT OF TEST: Measure the Absolute Flux in lumens*, Spectral Power Distribution (SPD), Correlated Color Temperature (CCT), Color Rendering Index (CRIa,1-15), Chromaticity Coordinates (x,y; u',v'), ANSI C78.377 Duv, Total Radiant Flux*, Scotopic / Photopic Lumen Ratio, and electrical data including ANSI C82.77-10-2014 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 120VAC 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)

Checked *A Technician*
Approved *An Engineer*

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RESULTS:

PHOTOMETRIC	
Total Integrated Flux (lumens)	2752 *
SPECTRORADIOMETRIC	
Observer	CIE 1931 2 degree
Chromaticity Ordinate x	0.3769
Chromaticity Ordinate y	0.3743
Observer	CIE 1976 2 degree
Chromaticity Ordinate u'	0.2237
Chromaticity Ordinate v'	0.5000
Correlated Color Temp CCT (K)	4081
ANSI C78.377-2015 Duv	0.000
Total Radiant Flux (milliWatts)	8094 *
Scotopic / Photopic Lumen Ratio	1.550
ELECTRICAL	
Input Voltage (Volts AC)	120.0
Input Current (Amps AC)	0.468
Input Power (Watts)	55.8
Input Power Factor (%)	99.4
Input Current THD (%)	9.8
Input Voltage THD (%)	0.1
EFFICACY (lumens/Watt)	49.3

COLOR RENDERING INDICES	CRI
Ra (Average 1-8)	72
R1 Light greyish red	70
R2 Dark greyish yellow	77
R3 Strong yellowish green	82
R4 Moderate yellowish green	73
R5 Light bluish green	70
R6 Light blue	68
R7 Light violet	80
R8 Light reddish purple	56
R9 Strong red	-24
R10 Strong yellow	45
R11 Strong green	71
R12 Strong blue	45
R13 Light yellowish pink (skin)	70
R14 Moderate olive green (leaf)	89
R15 Japanese complexion (JIS)	63

*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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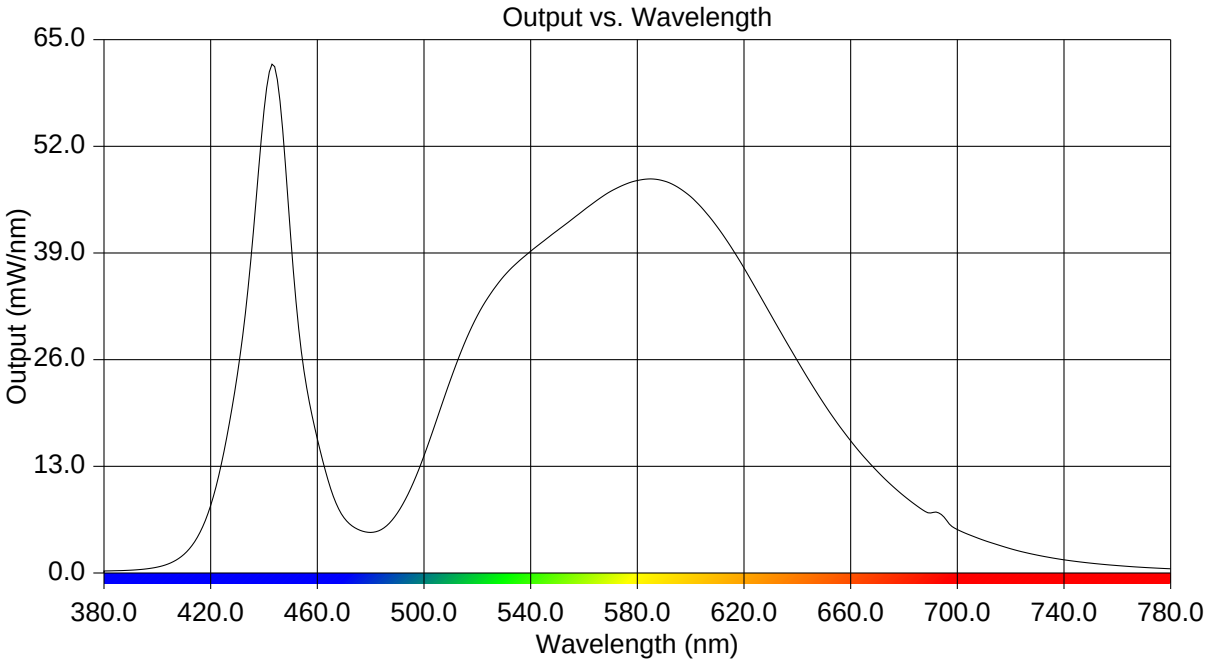
RESULTS:

Wavelength	mW per nm	Wavelength	mW per nm	Wavelength	mW per nm
380	0.244	515	27.857	650	20.628
385	0.280	520	31.358	655	18.258
390	0.342	525	34.051	660	16.109
395	0.468	530	36.195	665	14.147
400	0.719	535	37.834	670	12.389
405	1.229	540	39.215	675	10.797
410	2.274	545	40.490	680	9.387
415	4.348	550	41.743	685	8.141
420	8.229	555	42.978	690	7.314
425	14.809	560	44.241	695	6.822
430	24.155	565	45.451	700	5.296
435	37.936	570	46.516	705	4.591
440	56.365	575	47.310	710	3.978
445	60.128	580	47.834	715	3.452
450	41.015	585	48.031	720	2.955
455	24.623	590	47.777	725	2.531
460	16.346	595	47.054	730	2.175
465	10.279	600	45.874	735	1.869
470	6.732	605	44.207	740	1.607
475	5.351	610	42.169	745	1.389
480	4.942	615	39.807	750	1.202
485	5.502	620	37.175	755	1.041
490	7.301	625	34.359	760	0.905
495	10.285	630	31.504	765	0.782
500	14.281	635	28.660	770	0.677
505	18.919	640	25.883	775	0.590
510	23.609	645	23.184	780	0.513



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CIE Chromaticity Diagram