



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: ITL94146-SPHERE
DATE: 10/19/20
PREPARED FOR: LITELAB CORPORATION
CATALOG NUMBER: C75L700-(FITTER)-(VOLTAGE)-9230-(FINISH)-5

ADDRESS: 251 ELM STREET
BUFFALO, NY 14203

LUMINAIRE: FABRICATED DIFFUSE METAL DRIVER HOUSING, CAST WHITE PAINTED METAL HOUSING WITH FINNED HEAT SINK, ONE CIRCUIT BOARD WITH 1 LED, FABRICATED DIFFUSE METAL OPTIC MOUNTING RING, CLEAR CONICAL PLASTIC OPTIC WITH RECESSED CONVEX TOP CENTER AND CONCAVE MICRO-PRISMATIC BOTTOM. MOLDED BLACK PLASTIC FRAME, BLACK PLASTIC LOWER BAFFLE.

LAMP: ONE WHITE LIGHT EMITTING DIODE (LED), VERTICAL BASE-UP POSITION.

DRIVER: LITELAB PROPRIETARY

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

INSTRUMENTS:	Associated Power Technologies APT5040 AC Power Source	Calibration Due:
	Yokogawa WT210 Digital Power Meter #6	N/A
	Ocean Optics QE65000 Spectroradiometer	01/24/21
	ITL 2.0m Diameter Integrating Sphere S20-2, 4PI Geometry	03/23/21
	Omega HH802U Digital Thermometer #9	03/10/21

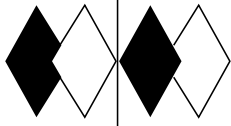
OBJECT OF TEST: Measure the Absolute Flux in lumens*, Spectral Power Distribution (SPD), Correlated Color Temperature (CCT), Color Rendering Index (CRIa,1-15), TM-30-15 Basic Color Metrics, Chromaticity Coordinates (x,y; u',v'), ANSI C78.377 Duv, Total Radiant Flux*, Scotopic / Photopic Lumen Ratio, 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-79-19. 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.

Approved R. BERGIN



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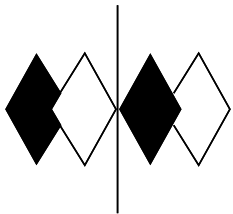
RESULTS:

PHOTOMETRIC	
Total Integrated Flux (lumens)	675 *
SPECTRORADIOMETRIC	
Observer	CIE 1931 2 degree
Chromaticity Ordinate x	0.4362
Chromaticity Ordinate y	0.4067
Observer	CIE 1976 2 degree
Chromaticity Ordinate u'	0.2490
Chromaticity Ordinate v'	0.5223
Correlated Color Temp CCT (K)	3034
ANSI C78.377-2015 Duv	0.0011
Total Radiant Flux (milliWatts)	2286 *
Scotopic / Photopic Lumen Ratio	1.4421
ELECTRICAL	
Input Voltage (Volts AC)	120.0
Input Current (Amps AC)	0.161
Input Power (Watts)	17.6
Input Power Factor (%)	91.1
Input Current THD (%)	14.2
Input Voltage THD (%)	0.1
EFFICACY (lumens/Watt)	38.4

COLOR RENDERING INDICES		CRI
Ra (Average 1-8)		90
R1 Light greyish red		90
R2 Dark greyish yellow		94
R3 Strong yellowish green		97
R4 Moderate yellowish green		91
R5 Light bluish green		90
R6 Light blue		93
R7 Light violet		91
R8 Light reddish purple		78
R9 Strong red		50
R10 Strong yellow		85
R11 Strong green		91
R12 Strong blue		80
R13 Light yellowish pink (skin)		91
R14 Moderate olive green (leaf)		98
R15 Japanese complexion (JIS)		85

*NOTE: The total lumen output shown on this report was obtained from photometric test ITL94146-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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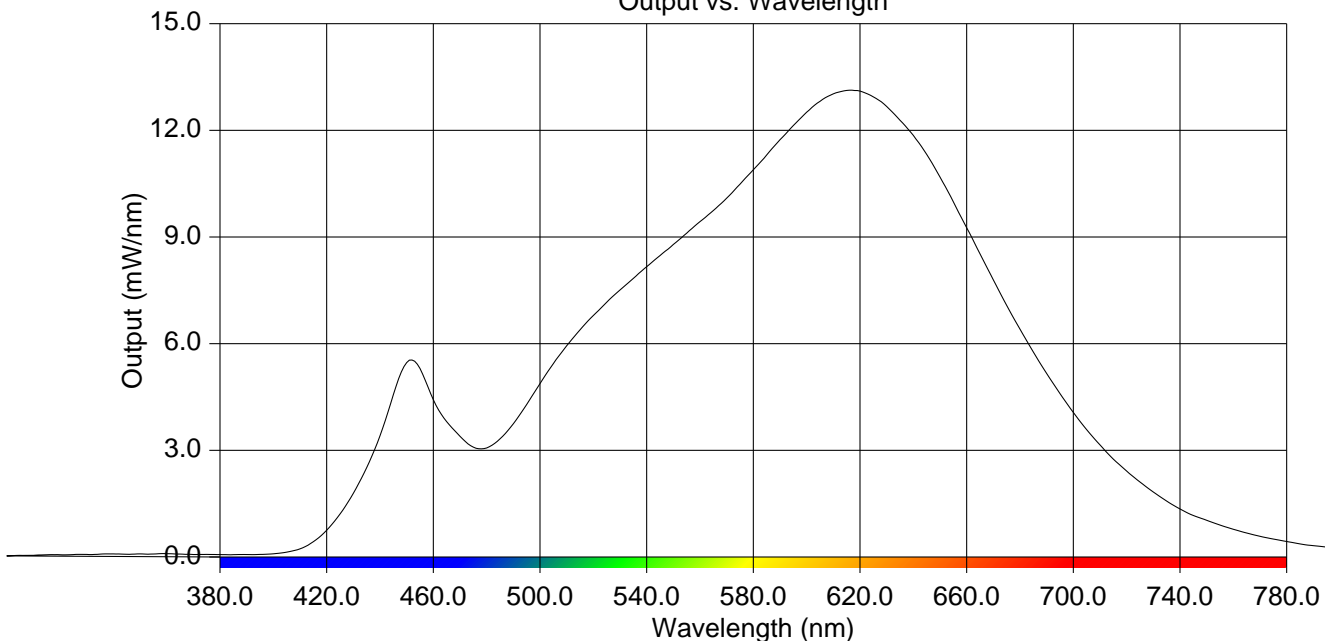
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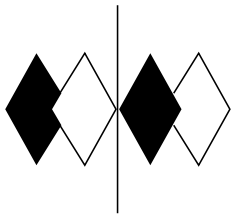
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RESULTS:

Wavelength	mW per nm	Wavelength	mW per nm	Wavelength	mW per nm
380	0.068	515	6.388	650	10.686
385	0.066	520	6.791	655	9.990
390	0.069	525	7.164	660	9.260
395	0.073	530	7.510	665	8.526
400	0.089	535	7.835	670	7.794
405	0.137	540	8.165	675	7.077
410	0.229	545	8.477	680	6.408
415	0.430	550	8.790	685	5.765
420	0.753	555	9.106	690	5.161
425	1.208	560	9.433	695	4.595
430	1.791	565	9.744	700	4.066
435	2.512	570	10.092	705	3.581
440	3.409	575	10.485	710	3.153
445	4.564	580	10.890	715	2.752
450	5.467	585	11.306	720	2.417
455	5.302	590	11.736	725	2.108
460	4.424	595	12.135	730	1.827
465	3.807	600	12.510	735	1.573
470	3.395	605	12.815	740	1.351
475	3.090	610	13.026	745	1.168
480	3.066	615	13.122	750	1.032
485	3.323	620	13.104	755	0.898
490	3.747	625	12.941	760	0.780
495	4.288	630	12.671	765	0.675
500	4.876	635	12.283	770	0.582
505	5.437	640	11.858	775	0.505
510	5.941	645	11.324	780	0.436

Output vs. Wavelength

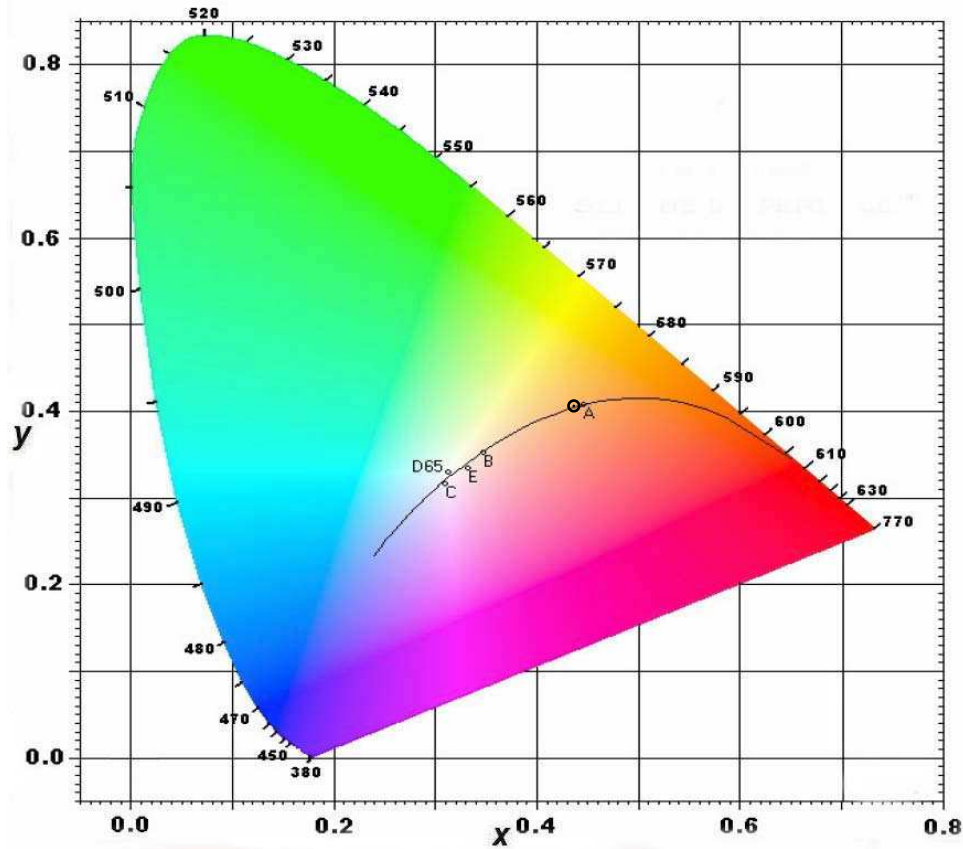




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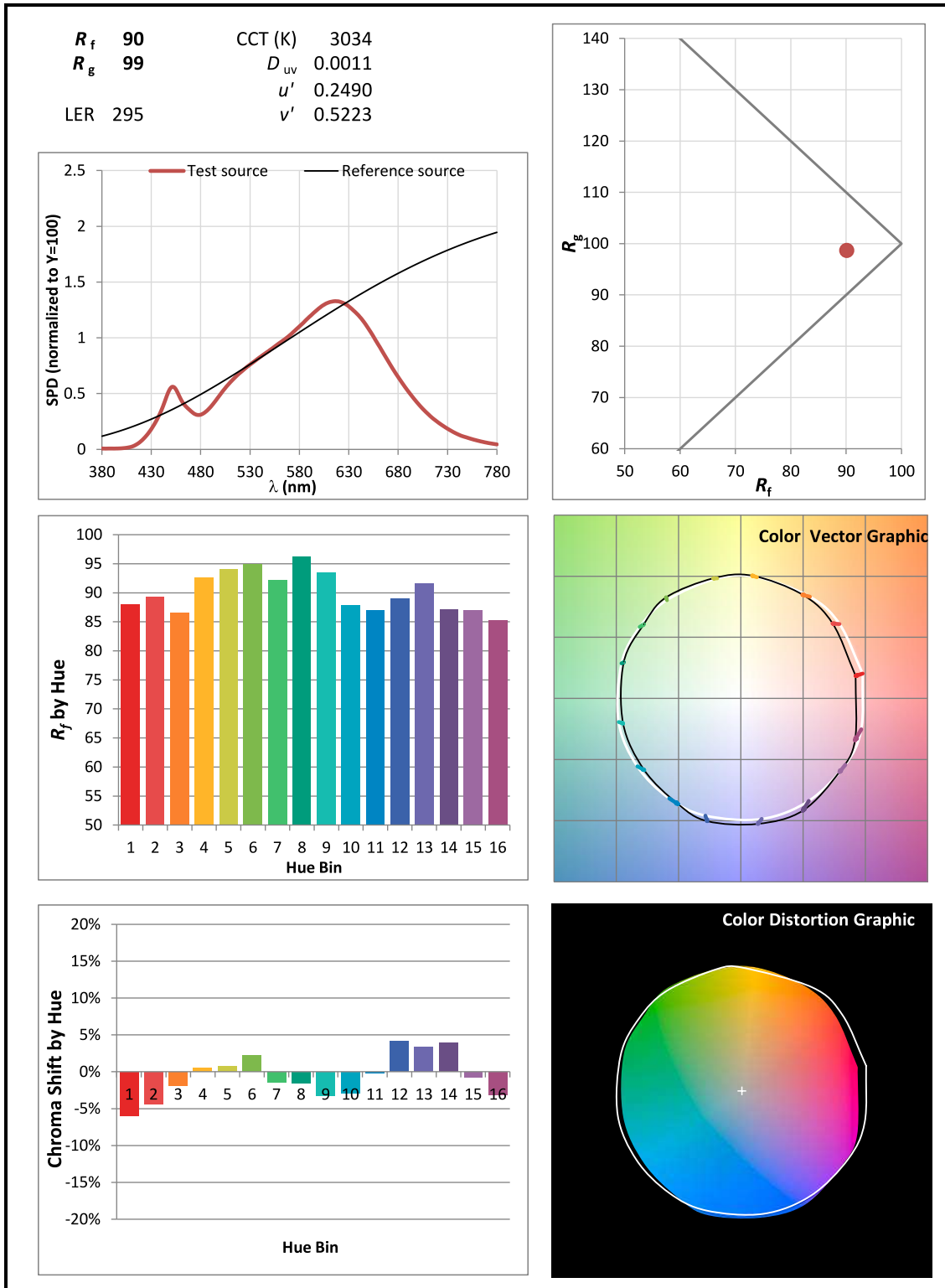
CIE Chromaticity Diagram

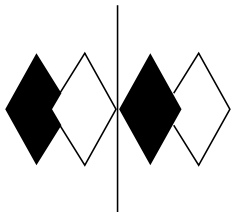


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RESULTS: TM-30-18





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 RESULTS: TM-30-18

Hue Bin	R_f	Graphic shifts (%)	
		Chroma	Hue
1	88	-6%	-1%
2	89	-4%	3%
3	87	-2%	6%
4	93	0%	4%
5	94	1%	3%
6	95	2%	-1%
7	92	-1%	-4%
8	96	-2%	-1%
9	93	-3%	2%
10	88	-3%	5%
11	87	0%	9%
12	89	4%	2%
13	92	3%	-4%
14	87	4%	-8%
15	87	-1%	-8%
16	85	-3%	-10%