

itl boulder
 THE LIGHT CENTER OF THE INDUSTRY SINCE 1955

PHONE: (303) 442-1255

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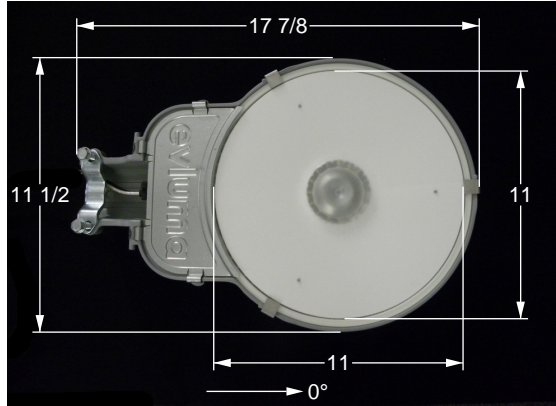


NVLAP LAB CODE: 200925-0

INDEPENDENT TESTING LABORATORIES, INC.

4066 CAMELOT CIRCLE, LONGMONT, CO 80504 USA

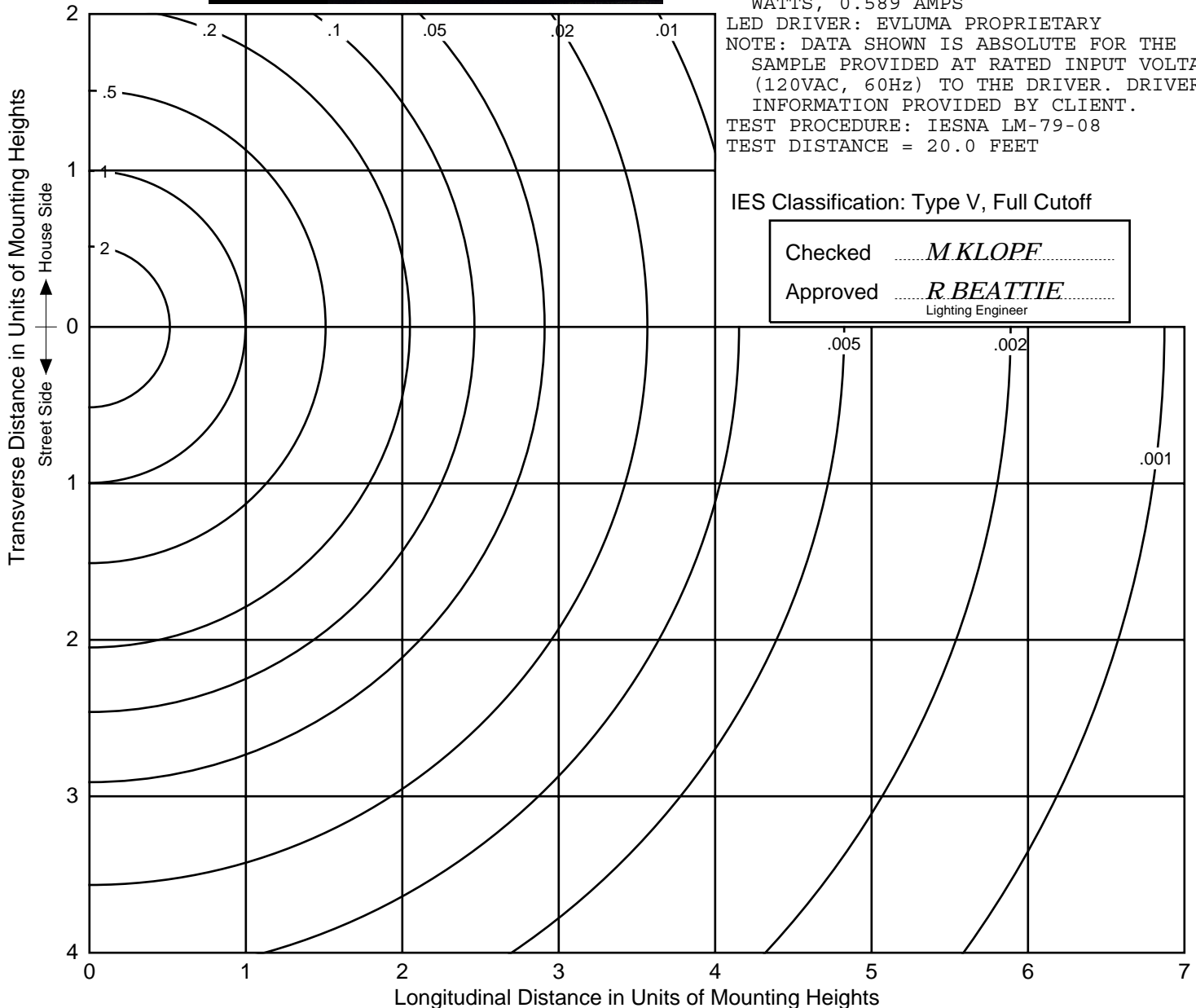
ISOFOOTCANDLE LINES OF HORIZONTAL ILLUMINATION
 Values based on 25 foot mounting height.

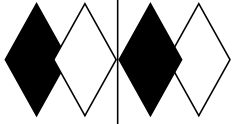


REPORT NUMBER: ITL88133-GONIOPHOTOMETRY
 ISSUE DATE: 08/16/16 PAGE: 1 OF 7
 PREPARED FOR: EVLUMA
 CATALOG NUMBER: AMAX-70-5K-6-V-C-S3-0
 LUMINAIRE: CAST FINNED METAL HOUSING WITH FORMED METAL ACCESS DOOR, 32 LEDS, WHITE FIBROUS REFLECTOR, FABRICATED MULTI-FACETED SEGMENTED METAL CENTER REFLECTOR WITH PREMIUM SPECULAR FINISH, CLEAR MICRO-PRISMATIC FLAT GLASS LENS, LENS PRISMS OUT.
 LAMPS: THIRTY-TWO WHITE LIGHT EMITTING DIODES (LEDS) EACH WITH CLEAR HEMISPHERICAL INTEGRAL LENS, VERTICAL BASE-UP POSITION.
 INPUT ELECTRICAL: 120.0 VOLTS, 70.5 WATTS, 0.589 AMPS
 LED DRIVER: EVLUMA PROPRIETARY
 NOTE: DATA SHOWN IS ABSOLUTE FOR THE SAMPLE PROVIDED AT RATED INPUT VOLTAGE (120VAC, 60Hz) TO THE DRIVER. DRIVER INFORMATION PROVIDED BY CLIENT.
 TEST PROCEDURE: IESNA LM-79-08
 TEST DISTANCE = 20.0 FEET

IES Classification: Type V, Full Cutoff

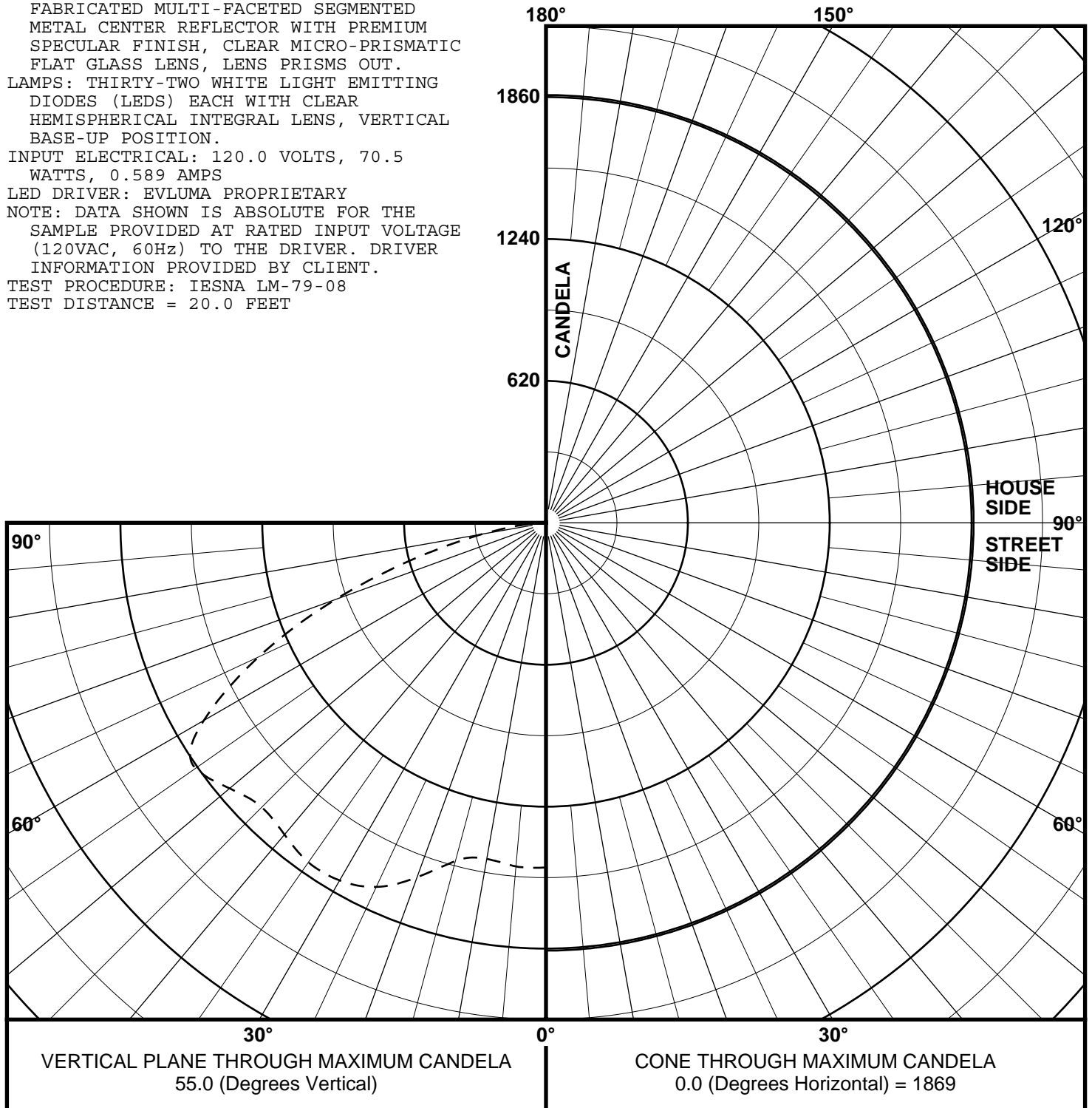
Checked *M KLOPF*
 Approved *R BEATTIE*
 Lighting Engineer

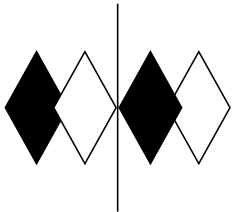




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 WITH FORMED METAL ACCESS DOOR, 32
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 TEST PROCEDURE: IESNA LM-79-08
 TEST DISTANCE = 20.0 FEET

MAXIMUM PLANE AND MAXIMUM CONE PLOTS OF CANDELA

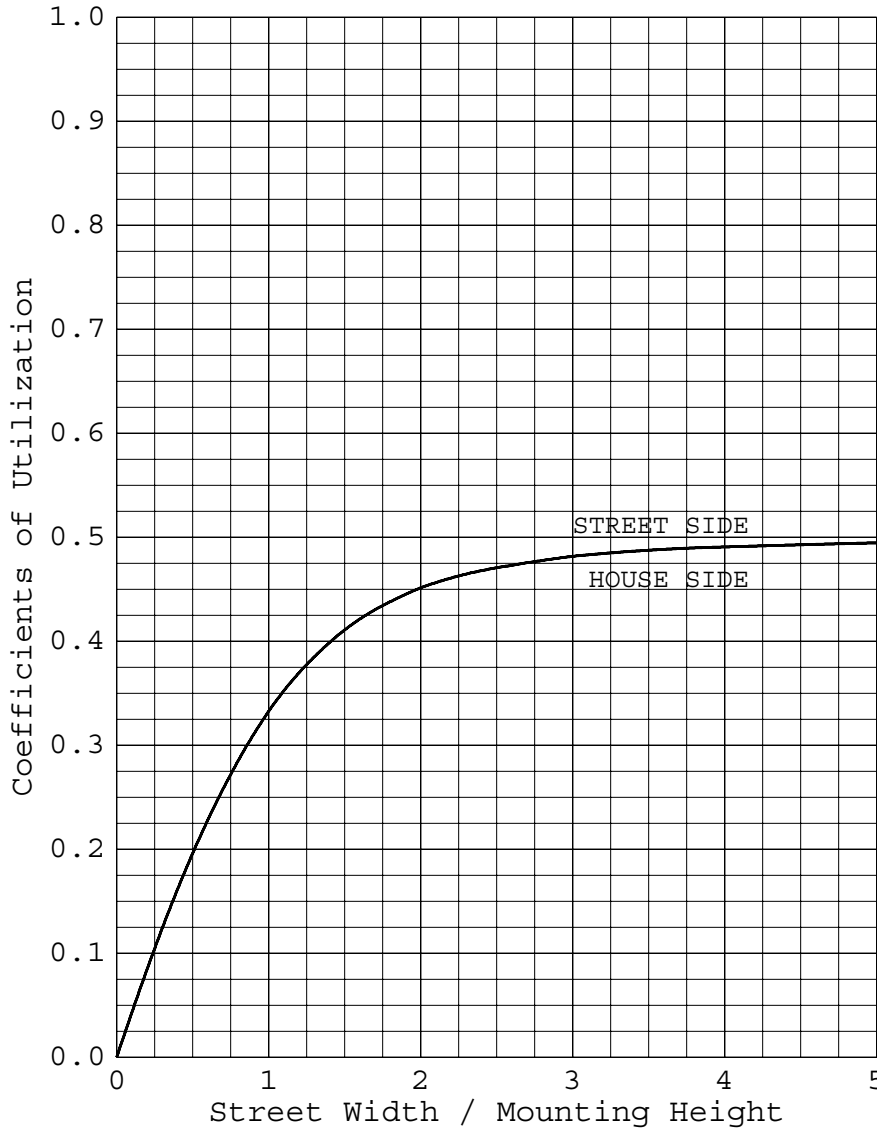




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COEFFICIENTS OF UTILIZATION AND FLUX DISTRIBUTION



	LUMENS	PERCENT OF FIXTURE
DOWNWARD STREET SIDE	3826	50.0
DOWNWARD HOUSE SIDE	3826	50.0
DOWNWARD TOTAL	7651	100.0
UPWARD STREET SIDE	0	0.0
UPWARD HOUSE SIDE	0	0.0
UPWARD TOTAL	0	0.0
TOTAL FLUX	7651	100.0

EFFICACY = 108.5 lm/W

ALL CANDELA AND LUMENS IN THIS REPORT ARE BASED ON ABSOLUTE PHOTOMETRY. THE COEFFICIENT OF UTILIZATION VALUES ARE BASED ON THE TOTAL ABSOLUTE LUMEN OUTPUT OF THIS LUMINAIRE SAMPLE.



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FLUX DISTRIBUTION BY SOLID ANGLE

(PER IESNA TM-15-11, LUMINAIRE CLASSIFICATION SYSTEM FOR OUTDOOR LUMINAIRES)

	LUMENS	PERCENT OF FIXTURE	BUG ZONE RATINGS
FORWARD LIGHT	3826.	50.0	
FL (0- 30)	696.4	9.1	
FM (30- 60)	2072.6	27.1	
FH (60- 80)	994.2	13.0	G1
FVH(80- 90)	62.6	0.8	G1
BACK LIGHT	3826.	50.0	
BL (0- 30)	696.4	9.1	B2
BM (30- 60)	2072.6	27.1	B2
BH (60- 80)	994.2	13.0	B2 G1
BVH(80- 90)	62.6	0.8	G1
UPLIGHT	0.	0.0	
UL (90-100)	0.0	0.0	U0
UH (100-180)	0.0	0.0	U0
TRAPPED LIGHT	0.	0.0	
TOTAL FLUX	7651.	100.0	

BACKLIGHT, UPLIGHT, AND GLARE (BUG) RATINGS
(PER ADDENDUM A FOR IESNA TM-15-11)

BUG RATING: B2 U0 G1



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CANDELA TABULATION

TYPE V

	90.0	0.
	87.5	44.
	85.0	100.
	82.5	176.
	80.0	280.
	77.5	414.
	75.0	577.
	72.5	770.
	70.0	980.
	67.5	1188.
	65.0	1386.
V	62.5	1567.
E	60.0	1727.
R	57.5	1842.
T	55.0<<	1869.
I	52.5	1843.
C	50.0	1805.
A	47.5	1773.
L	45.0	1757.
	42.5	1762.
A	40.0	1778.
N	37.5	1797.
G	35.0	1810.
L	32.5	1812.
E	30.0	1804.
	27.5	1786.
	25.0	1755.
	22.5	1708.
	20.0	1648.
	17.5	1585.
	15.0	1530.
	12.5	1498.
	10.0	1491.
	7.5	1496.
	5.0	1507.
	2.5	1508.
	0.0	1506.

CONE OF MAXIMUM CANDELA



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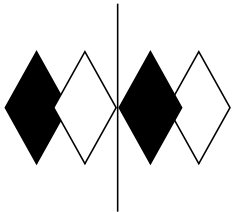
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5-DEGREE
ZONAL LUMEN SUMMARY

0- 5	36
5- 10	107
10- 15	179
15- 20	262
20- 25	358
25- 30	451
30- 35	533
35- 40	599
40- 45	653
45- 50	718
50- 55	800
55- 60	841
60- 65	759
65- 70	600
70- 75	404
75- 80	225
80- 85	99
85- 90	26

10-DEGREE
ZONAL LUMEN SUMMARY

0- 10	143
0- 20	584
0- 30	1393
0- 40	2525
0- 50	3897
0- 60	5538
0- 70	6897
0- 80	7526
0- 90	7651



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PAGE: 7 OF 7

ADDRESS: 3600 LIND AVE. SW
SUITE 140
RENTON, WA 98057

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REPORT NUMBER: ITL88133-SPHERE
DATE: 08/18/16
PREPARED FOR: EVLUMA
CATALOG NUMBER: AMAX-70-5K-6-V-C-S3-0

ADDRESS: 3600 LIND AVE. SW
SUITE 140
RENTON, WA 98057

LUMINAIRE: CAST FINNED METAL HOUSING WITH FORMED METAL ACCESS DOOR, 32 LEDS, WHITE FIBROUS REFLECTOR, FABRICATED MULTI-FACETED SEGMENTED METAL CENTER REFLECTOR WITH PREMIUM SPECULAR FINISH, CLEAR MICRO-PRISMATIC FLAT GLASS LENS, LENS PRISMS OUT.

LAMP: THIRTY-TWO WHITE LIGHT EMITTING DIODES (LEDS) EACH WITH CLEAR HEMISPHERICAL INTEGRAL LENS, VERTICAL BASE-UP POSITION.

DRIVER: EVLUMA PROPRIETARY

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

INSTRUMENTS:	Associated Power Technologies APT5040 AC Power Source	Calibration Due:
	Yokogawa WT210 Digital Power Meter #6	N/A
	Ocean Optics QE65000 Spectroradiometer	12/07/16
	ITL 2.0m Diameter Integrating Sphere S20-2, 4PI Geometry	04/19/17

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 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 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)

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



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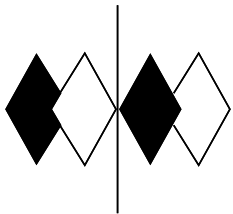
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RESULTS:

PHOTOMETRIC	
Total Integrated Flux (lumens)	7651 *
SPECTRORADIOMETRIC	
Observer	CIE 1931 2 degree
Chromaticity Ordinate x	0.3474
Chromaticity Ordinate y	0.3620
Observer	CIE 1976 2 degree
Chromaticity Ordinate u'	0.2089
Chromaticity Ordinate v'	0.4900
Correlated Color Temp CCT (K)	4952
ANSI C78.377-2008 Duv	0.004
Total Radiant Flux (milliWatts)	22980 *
Scotopic / Photopic Lumen Ratio	1.779
ELECTRICAL	
Input Voltage (Volts AC)	120.0
Input Current (Amps AC)	0.590
Input Power (Watts)	70.6
Input Power Factor (%)	99.7
Input Current THD (%)	7.7
Input Voltage THD (%)	0.2
EFFICACY (lumens/Watt)	108.4

COLOR RENDERING INDICES		CRI
Ra (Average 1-8)		72
R1	Light greyish red	70
R2	Dark greyish yellow	76
R3	Strong yellowish green	81
R4	Moderate yellowish green	74
R5	Light bluish green	71
R6	Light blue	68
R7	Light violet	81
R8	Light reddish purple	58
R9	Strong red	-26
R10	Strong yellow	43
R11	Strong green	72
R12	Strong blue	47
R13	Light yellowish pink (skin)	70
R14	Moderate olive green (leaf)	89

*NOTE: The total lumen output shown on this report was obtained from photometric test ITL88133-GONIOPHOTOMETRY



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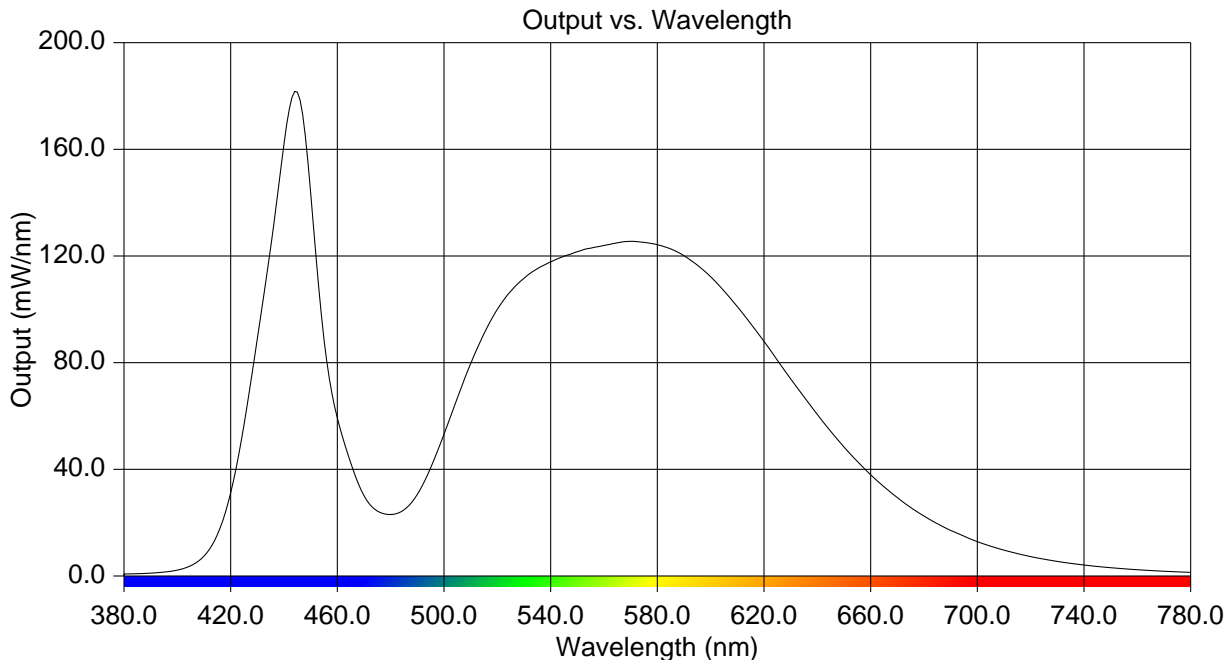
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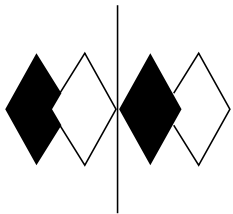
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RESULTS:

Wavelength	mW per nm	Wavelength	mW per nm	Wavelength	mW per nm
380	0.749	515	90.872	650	48.374
385	0.856	520	100.021	655	42.980
390	1.071	525	106.747	660	37.952
395	1.463	530	111.632	665	33.459
400	2.203	535	115.244	670	29.399
405	3.846	540	117.799	675	25.688
410	7.443	545	119.898	680	22.476
415	15.475	550	121.625	685	19.614
420	31.187	555	122.929	690	17.096
425	56.650	560	123.970	695	14.938
430	89.009	565	124.937	700	12.876
435	123.196	570	125.502	705	11.180
440	161.986	575	125.121	710	9.695
445	181.481	580	124.230	715	8.418
450	143.711	585	122.672	720	7.267
455	88.668	590	120.092	725	6.313
460	59.279	595	116.593	730	5.466
465	42.470	600	112.214	735	4.742
470	30.116	605	106.899	740	4.121
475	24.356	610	101.005	745	3.570
480	23.049	615	94.639	750	3.112
485	24.797	620	87.988	755	2.709
490	30.612	625	80.938	760	2.354
495	40.588	630	73.931	765	2.050
500	53.187	635	67.186	770	1.783
505	66.732	640	60.576	775	1.557
510	79.630	645	54.270	780	1.366





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CIE Chromaticity Diagram

