

**itl boulder**  
 THE LIGHT CENTER OF THE INDUSTRY SINCE 1955

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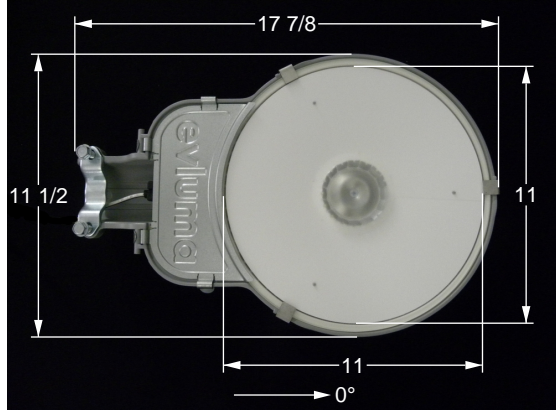
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INDEPENDENT TESTING LABORATORIES, INC.  
 4066 CAMELOT CIRCLE, LONGMONT, CO 80504 USA

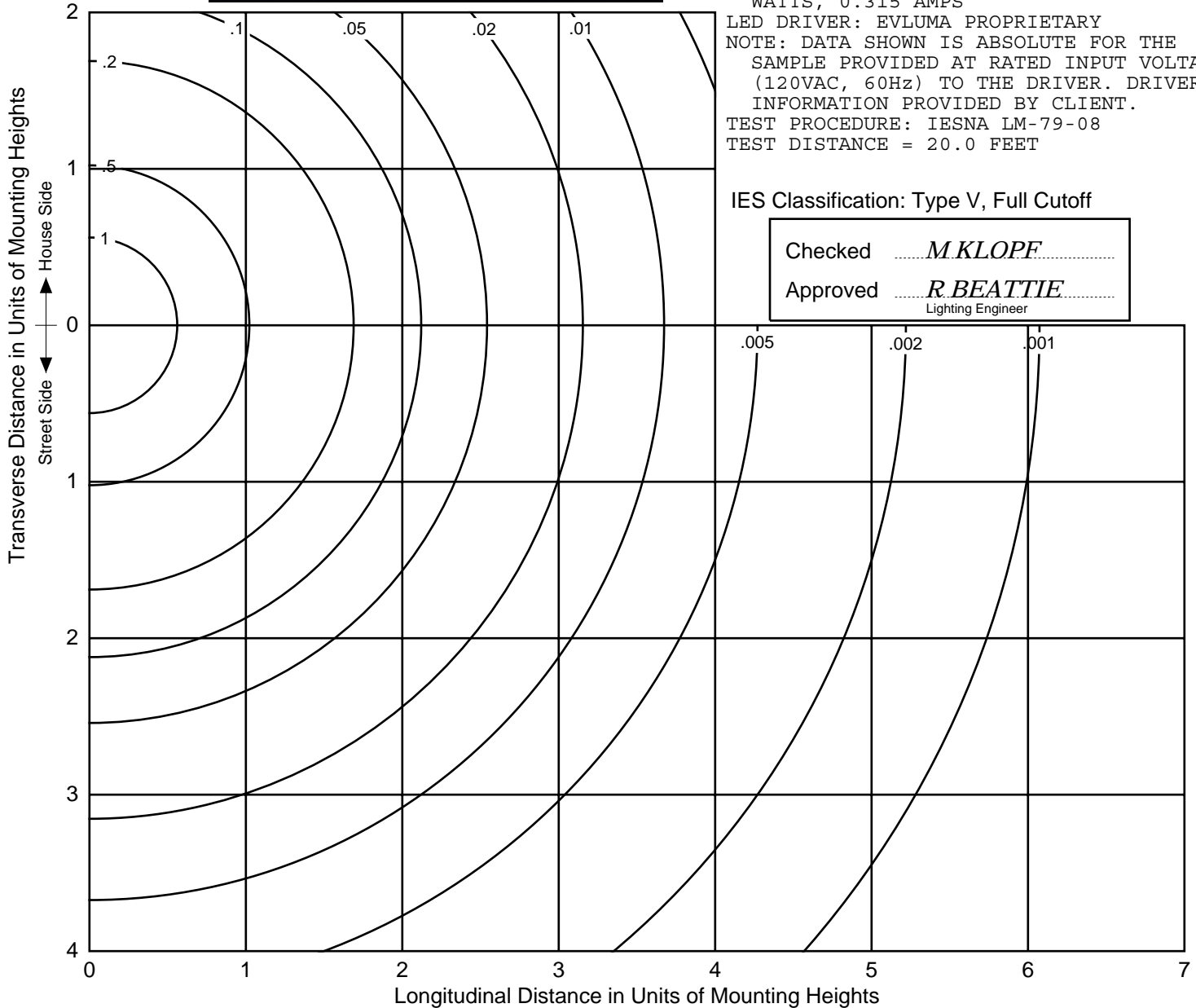
**ISOFOOTCANDLE LINES OF HORIZONTAL ILLUMINATION**  
 Values based on 25 foot mounting height.

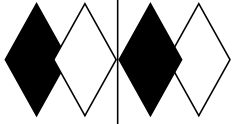


REPORT NUMBER: ITL88123-GONIOPHOTOMETRY  
 ISSUE DATE: 08/12/16 PAGE: 1 OF 7  
 PREPARED FOR: EVLUMA  
 CATALOG NUMBER: AMAX-40-4K-6-V-C-S3-0  
 LUMINAIRE: CAST FINNED METAL HOUSING WITH FORMED METAL ACCESS DOOR, 16 LEDS, WHITE FIBROUS REFLECTOR, FABRICATED MULTI-FACETED SEGMENTED METAL CENTER REFLECTOR WITH PREMIUM SPECULAR FINISH, CLEAR MICRO-PRISMATIC FLAT GLASS LENS, LENS PRISMS OUT.  
 LAMPS: SIXTEEN WHITE LIGHT EMITTING DIODES (LEDS) EACH WITH CLEAR HEMISPHERICAL INTEGRAL LENS, VERTICAL BASE-UP POSITION.  
 INPUT ELECTRICAL: 120.0 VOLTS, 37.7 WATTS, 0.315 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

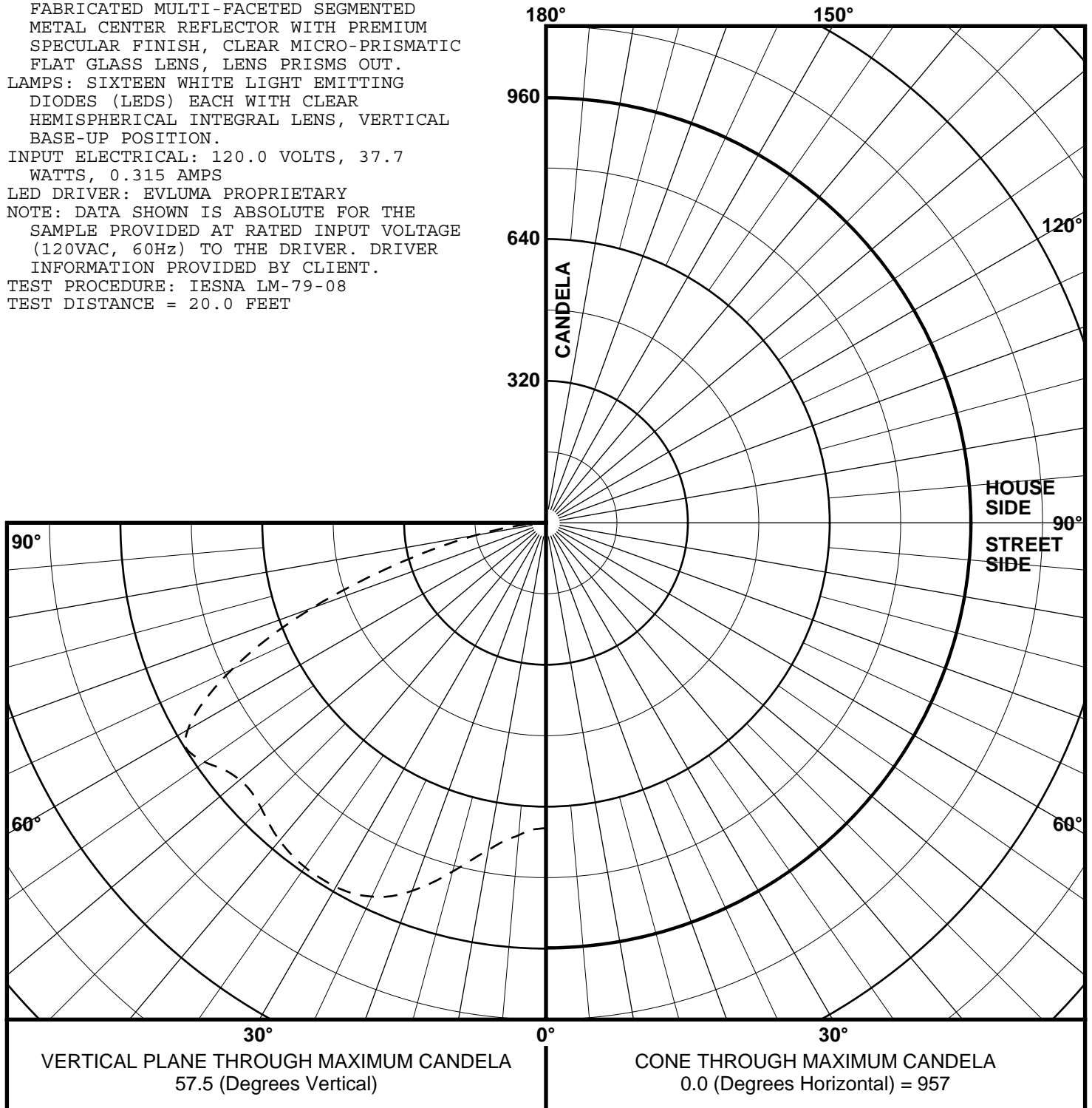
Checked	<i>M. KLOPF</i>
Approved	<i>R. BEATTIE</i> Lighting Engineer

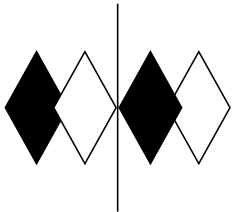




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 WITH FORMED METAL ACCESS DOOR, 16  
 LEDS, WHITE FIBROUS REFLECTOR,  
 FABRICATED MULTI-FACETED SEGMENTED  
 METAL CENTER REFLECTOR WITH PREMIUM  
 SPECULAR FINISH, CLEAR MICRO-PRISMATIC  
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 INFORMATION PROVIDED BY CLIENT.  
 TEST PROCEDURE: IESNA LM-79-08  
 TEST DISTANCE = 20.0 FEET

MAXIMUM PLANE AND MAXIMUM CONE PLOTS OF CANDELA

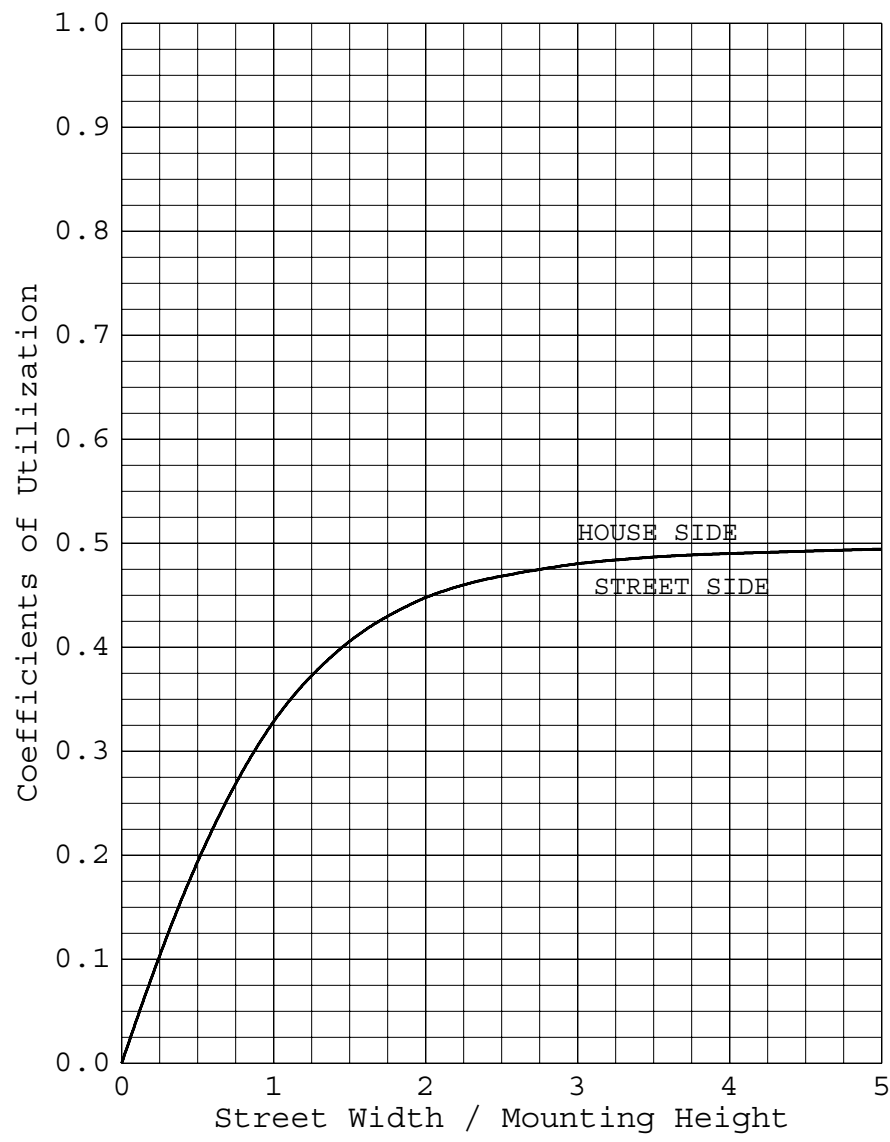




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COEFFICIENTS OF UTILIZATION AND FLUX DISTRIBUTION



	LUMENS	PERCENT OF FIXTURE
DOWNWARD STREET SIDE	2029	50.0
DOWNWARD HOUSE SIDE	2029	50.0
DOWNWARD TOTAL	4059	100.0
UPWARD STREET SIDE	0	0.0
UPWARD HOUSE SIDE	0	0.0
UPWARD TOTAL	0	0.0
TOTAL FLUX	4059	100.0

EFFICACY = 107.7 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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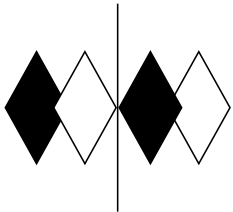
FLUX DISTRIBUTION BY SOLID ANGLE

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

	LUMENS	PERCENT OF FIXTURE	BUG ZONE RATINGS
FORWARD LIGHT	2029.	50.0	
FL ( 0- 30)	365.3	9.0	
FM ( 30- 60)	1068.5	26.3	
FH ( 60- 80)	560.5	13.8	G0
FVH( 80- 90)	35.0	0.9	G1
BACK LIGHT	2029.	50.0	
BL ( 0- 30)	365.3	9.0	B1
BM ( 30- 60)	1068.5	26.3	B2
BH ( 60- 80)	560.5	13.8	B2 G0
BVH( 80- 90)	35.0	0.9	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	4059.	100.0	

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

BUG RATING: B2 U0 G1



REPORT NUMBER: ITL88123-GONIOPHOTOMETRY  
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CANDELA TABULATION

TYPE V

	90.0	0.
	87.5	23.
	85.0	54.
	82.5	100.
	80.0	161.
	77.5	238.
	75.0	330.
	72.5	440.
	70.0	561.
	67.5	677.
	65.0	781.
V	62.5	869.
E	60.0	933.
R	57.5<<	957.
T	55.0	940.
I	52.5	915.
C	50.0	902.
A	47.5	900.
L	45.0	909.
	42.5	923.
A	40.0	935.
N	37.5	943.
G	35.0	948.
L	32.5	949.
E	30.0	948.
	27.5	942.
	25.0	930.
	22.5	911.
	20.0	883.
	17.5	850.
	15.0	814.
	12.5	779.
	10.0	749.
	7.5	724.
	5.0	707.
	2.5	692.
	0.0	688.

CONE OF MAXIMUM CANDELA



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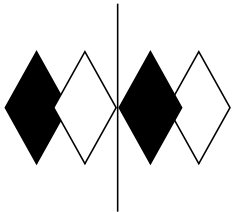
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5-DEGREE  
ZONAL LUMEN SUMMARY

0- 5	17
5- 10	52
10- 15	93
15- 20	140
20- 25	191
25- 30	238
30- 35	279
35- 40	314
40- 45	342
45- 50	365
50- 55	399
55- 60	438
60- 65	419
65- 70	341
70- 75	231
75- 80	129
80- 85	56
85- 90	14

10-DEGREE  
ZONAL LUMEN SUMMARY

0- 10	69
0- 20	302
0- 30	731
0- 40	1324
0- 50	2031
0- 60	2868
0- 70	3628
0- 80	3989
0- 90	4059



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NVLAP LAB CODE: 200925-0

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PAGE: 7 OF 7

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

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DATE: 08/18/16  
PREPARED FOR: EVLUMA  
CATALOG NUMBER: AMAX-40-4K-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, 16 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: SIXTEEN 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.

		Calibration Due:
INSTRUMENTS:	Associated Power Technologies APT5040 AC Power Source	N/A
	Yokogawa WT210 Digital Power Meter #6	12/07/16
	Ocean Optics QE65000 Spectroradiometer	04/19/17
	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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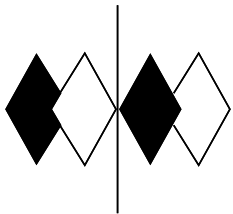
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RESULTS:

PHOTOMETRIC	
Total Integrated Flux (lumens)	4059 *
SPECTRORADIOMETRIC	
Observer	CIE 1931 2 degree
Chromaticity Ordinate x	0.3942
Chromaticity Ordinate y	0.3931
Observer	CIE 1976 2 degree
Chromaticity Ordinate u'	0.2276
Chromaticity Ordinate v'	0.5106
Correlated Color Temp CCT (K)	3772
ANSI C78.377-2008 Duv	0.004
Total Radiant Flux (milliWatts)	11752 *
Scotopic / Photopic Lumen Ratio	1.453
ELECTRICAL	
Input Voltage (Volts AC )	120.0
Input Current (Amps AC )	0.316
Input Power (Watts)	37.7
Input Power Factor (%)	99.4
Input Current THD (%)	7.5
Input Voltage THD (%)	0.1
EFFICACY (lumens/Watt)	107.7

COLOR RENDERING INDICES		CRI
Ra (Average 1-8)		72
R1	Light greyish red	69
R2	Dark greyish yellow	76
R3	Strong yellowish green	83
R4	Moderate yellowish green	73
R5	Light bluish green	69
R6	Light blue	69
R7	Light violet	79
R8	Light reddish purple	54
R9	Strong red	-26
R10	Strong yellow	46
R11	Strong green	72
R12	Strong blue	47
R13	Light yellowish pink (skin)	69
R14	Moderate olive green (leaf)	90

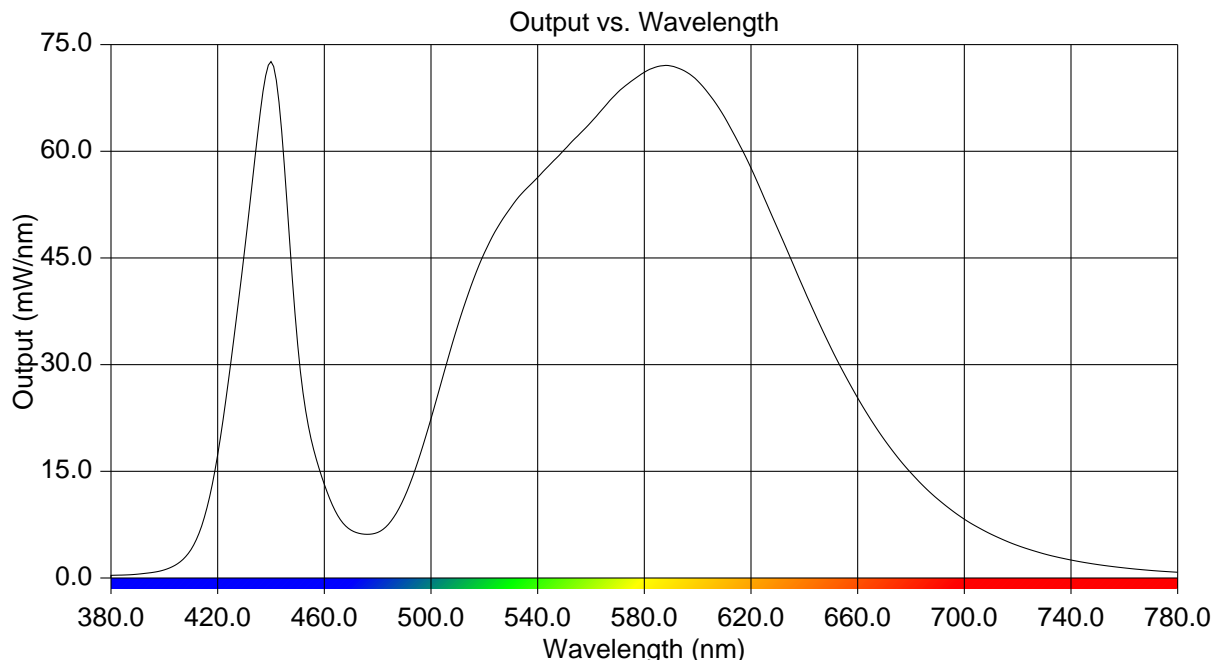
\*NOTE: The total lumen output shown on this report was obtained from photometric test ITL88123-GONIOPHOTOMETRY

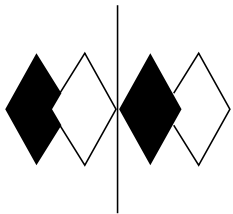


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RESULTS:

Wavelength	mW per nm	Wavelength	mW per nm	Wavelength	mW per nm
380	0.370	515	41.055	650	32.352
385	0.422	520	45.704	655	28.702
390	0.539	525	49.325	660	25.326
395	0.749	530	52.144	665	22.233
400	1.144	535	54.455	670	19.455
405	2.017	540	56.326	675	16.966
410	3.992	545	58.288	680	14.773
415	8.524	550	60.224	685	12.808
420	17.319	555	62.155	690	11.101
425	30.487	560	64.097	695	9.600
430	45.765	565	66.231	700	8.268
435	62.429	570	68.279	705	7.150
440	72.623	575	69.833	710	6.165
445	58.025	580	71.114	715	5.312
450	32.860	585	71.926	720	4.567
455	19.593	590	71.998	725	3.939
460	13.171	595	71.322	730	3.386
465	8.800	600	69.904	735	2.924
470	6.734	605	67.679	740	2.526
475	6.158	610	64.865	745	2.183
480	6.402	615	61.426	750	1.889
485	8.001	620	57.658	755	1.636
490	11.324	625	53.407	760	1.418
495	16.291	630	49.128	765	1.224
500	22.399	635	44.832	770	1.060
505	29.054	640	40.486	775	0.924
510	35.444	645	36.299	780	0.806





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## CIE Chromaticity Diagram

