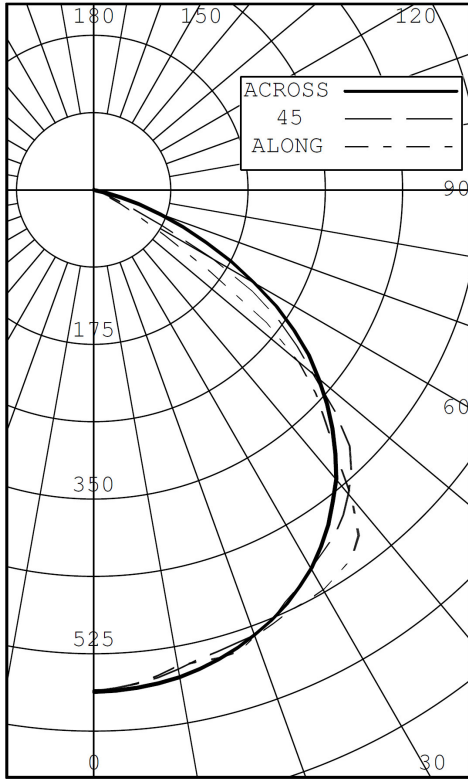




INDEPENDENT TEST LABORATORY REPORT No. 29022

SOLAR OUTDOOR LIGHTING - LED FLOOD LUMINAIRE, CAT# SMALL LED FLOODLIGHT
WITH ALUMINUM INTERIOR AND CLEAR FLAT GLASS LENS
FOUR LED ARRAYS. LUMINAIRE OUTPUT = 1340 LMS
LUMINAIRE OPERATING AT 13.0 VDC AND 16.8 WATTS



INTENSITY (CANDLEPOWER) SUMMARY						OUTPUT LUMENS
ANGLE	ALONG	22.5	45	67.5	ACROSS	
0	568	568	568	568	568	
5	561	561	561	562	566	54
10	547	548	551	555	560	
15	549	547	541	544	550	154
20	537	536	536	526	535	
25	526	521	514	509	517	239
30	522	515	494	493	494	
35	509	500	476	464	463	300
40	455	461	449	430	427	
45	371	371	410	388	382	297
50	303	306	324	346	333	
55	161	187	255	291	277	210
60	54	63	155	223	210	
65	20	22	44	133	141	75
70	6	7	10	64	81	
75	2	2	2	9	32	11
80	0	0	0	1	3	
85	0	0	0	0	0	0
90	0	0	0	0	0	

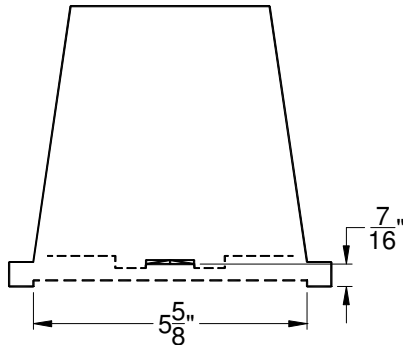
ZONAL LUMENS AND PERCENTAGES

ZONE	LUMENS	% LUMINAIRE
0-30	447	33.33
0-40	746	55.69
0-60	1253	93.54
0-90	1340	100.00
40-90	594	44.31
60-90	87	6.46
90-180	0	0.00
0-180	1340	100.00

EFFICACY (LUMENS PER WATT): 79.8

*** THIS IS AN ABSOLUTE TEST ***

LUMINOUS LENGTH: 8.000 INS
WIDTH: 5.625 INS



LUMINANCE SUMMARY CD./SQ.M.

ANGLE	ALONG	45	ACROSS
45	18072	20058	18697
55	9658	15357	16707
65	1621	3630	11531
75	297	240	4301
85	0	0	51

S/MH: 1.3
SC (ALONG): 1.4, SC (ACROSS): 1.3

CERTIFIED BY:

Ryder Ramsey

DATE:
MAY 3, 2011

PREPARED FOR:

SOLAR OUTDOOR LIGHTING INC
PALM CITY, FL

TESTED IN ACCORDANCE WITH IES PROCEDURES.

LIGHTING SCIENCES, INC.
 7826 E. EVANS RD.
 SCOTTSDALE, AZ, USA 85260

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 FOUR LED ARRAYS. LUMINAIRE OUTPUT = 1340 LMS
 LUMINAIRE OPERATING AT 13.0 VDC AND 16.8 WATTS

INTENSITY (CANDLEPOWER) DATA
 IN 2.5 DEGREE STEPS

ANGLE	PLANE						OUTPUT LUMENS
	ALONG	22.5	45	67.5	ACROSS	AVERAGE	
0.0	568	568	568	568	568	568	
2.5	565	565	565	565	567	565	
5.0	561	561	561	562	566	562	54
7.5	555	555	557	559	563	558	
10.0	547	548	551	555	560	552	
12.5	547	546	545	550	555	548	
15.0	549	547	541	544	550	545	154
17.5	548	546	538	536	543	541	
20.0	537	536	536	526	535	533	
22.5	531	528	527	516	527	525	
25.0	526	521	514	509	517	516	239
27.5	524	516	505	500	506	509	
30.0	522	515	494	493	494	502	
32.5	515	508	485	480	479	493	
35.0	509	500	476	464	463	482	300
37.5	493	490	464	447	445	467	
40.0	455	461	449	430	427	445	
42.5	406	412	432	409	405	415	
45.0	371	371	410	388	382	386	297
47.5	342	340	370	367	359	357	
50.0	303	306	324	346	333	324	
52.5	247	261	290	320	307	287	
55.0	161	187	255	291	277	238	210
57.5	95	111	213	261	246	189	
60.0	54	63	155	223	210	143	
62.5	34	38	88	176	176	102	
65.0	20	22	44	133	141	70	75
67.5	11	12	22	97	110	48	
70.0	6	7	10	64	81	31	
72.5	4	4	4	28	54	17	
75.0	2	2	2	9	32	8	11
77.5	1	1	1	3	14	3	
80.0	0	0	0	1	3	1	
82.5	0	0	0	0	0	0	
85.0	0	0	0	0	0	0	0
87.5	0	0	0	0	0	0	
90.0	0	0	0	0	0	0	

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AVERAGE LUMINANCE DATA

CD./SQ.M (FOOTLAMBERTS)

ANGLE	ALONG	22.5	45	67.5	ACROSS
0	19559 (5708)	19559 (5708)	19559 (5708)	19559 (5708)	19559 (5708)
30	20759 (6058)	20535 (5993)	19707 (5751)	19640 (5732)	19630 (5729)
40	20448 (5968)	20772 (6062)	20198 (5895)	19366 (5652)	19209 (5606)
45	18072 (5274)	18097 (5281)	20058 (5854)	18956 (5532)	18697 (5457)
50	16258 (4745)	16463 (4805)	17378 (5072)	18582 (5423)	17841 (5207)
55	9658 (2818)	11235 (3279)	15357 (4482)	17523 (5114)	16707 (4876)
60	3713 (1083)	4359 (1272)	10708 (3125)	15369 (4485)	14436 (4213)
65	1621 (473)	1826 (533)	3630 (1059)	10880 (3175)	11531 (3365)
70	645 (188)	700 (204)	1030 (300)	6504 (1898)	8150 (2378)
75	297 (86)	235 (68)	240 (70)	1236 (360)	4301 (1255)
80	42 (12)	68 (20)	68 (20)	128 (37)	537 (157)
85	0 (0)	0 (0)	0 (0)	102 (29)	51 (14)

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COEFFICIENTS OF UTILIZATION

ZONAL CAVITY METHOD

EFFECTIVE FLOOR CAVITY REFLECTANCE = .20

CC WALL	90				80				70				50				30				10				0
	70	50	30	10	70	50	30	10	70	50	30	10	50	30	10	50	30	10	50	30	10	50	30	10	0
RCR																									
0	1.221	1.221	1.221	1.22	1.191	1.191	1.191	1.19	1.161	1.161	1.161	1.16	1.111	1.111	1.11	1.061	1.061	1.06	1.021	1.021	1.02	1.00			
1	1.141	1.101	1.071	1.04	1.121	1.081	1.051	1.02	1.091	1.061	1.031	1.01	1.021	1.000	0.98	0.980	0.960	0.95	0.950	0.930	0.92	0.90			
2	1.071	1.000	0.950	0.90	1.040	0.990	0.940	0.89	1.020	0.970	0.920	0.88	0.930	0.890	0.86	0.900	0.870	0.84	0.870	0.850	0.82	0.81			
3	0.990	0.900	0.840	0.78	0.970	0.890	0.830	0.78	0.950	0.870	0.820	0.77	0.850	0.800	0.76	0.820	0.780	0.74	0.800	0.760	0.73	0.71			
4	0.920	0.820	0.740	0.69	0.900	0.810	0.740	0.68	0.880	0.800	0.730	0.68	0.770	0.720	0.67	0.750	0.700	0.66	0.730	0.690	0.65	0.64			
5	0.860	0.740	0.660	0.60	0.840	0.730	0.660	0.60	0.820	0.720	0.650	0.60	0.700	0.640	0.59	0.680	0.630	0.59	0.660	0.620	0.58	0.56			
6	0.790	0.670	0.590	0.53	0.770	0.660	0.580	0.53	0.760	0.650	0.580	0.52	0.630	0.570	0.52	0.620	0.560	0.52	0.600	0.550	0.51	0.49			
7	0.730	0.600	0.520	0.47	0.710	0.590	0.510	0.46	0.700	0.580	0.510	0.46	0.570	0.500	0.45	0.550	0.490	0.45	0.540	0.490	0.45	0.43			
8	0.670	0.540	0.460	0.41	0.660	0.540	0.460	0.41	0.650	0.530	0.460	0.40	0.520	0.450	0.40	0.510	0.440	0.40	0.490	0.440	0.40	0.38			
9	0.620	0.490	0.410	0.36	0.610	0.490	0.410	0.36	0.600	0.480	0.410	0.36	0.470	0.400	0.35	0.460	0.400	0.35	0.450	0.390	0.35	0.33			
10	0.580	0.450	0.370	0.32	0.570	0.440	0.370	0.32	0.550	0.440	0.370	0.31	0.430	0.360	0.31	0.420	0.350	0.31	0.410	0.350	0.31	0.29			

THE ABOVE COEFFICIENTS HAVE BEEN CALCULATED BASED ON LUMINAIRE LUMENS
 BECAUSE IN AN ABSOLUTE TEST THE BARE LAMP LUMENS ARE UNKNOWN.
 LIGHTING DESIGN CALCULATIONS MADE USING THESE COEFFICIENTS SHOULD
 THEREFORE USE THE LUMINAIRE LUMENS IN THE CALCULATION FORMULA

LUMINAIRE INPUT WATTS 16.8

LABORATORY RESULTS MAY NOT BE REPRESENTATIVE OF FIELD PERFORMANCE.
 BALLAST AND FIELD FACTORS HAVE NOT BEEN APPLIED.

TEST DISTANCE EXCEEDS FIVE TIMES THE GREATEST
 LUMINOUS OPENING OF LUMINAIRE.

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ELECTRICAL MEASUREMENTS

INPUT VOLTAGE: 13.0 VOLTS AC
INPUT CURRENT: 1.290 AMPS
INPUT POWER: 16.8 WATTS
POWER FACTOR: N/A PERCENT
TOTAL HARMONIC DISTORTION: N/A PERCENT
OFF STATE POWER: 0.00 WATTS

LIGHT OUTPUT

LUMENS: 1340 lm
EFFICACY: 79.8 lm/W

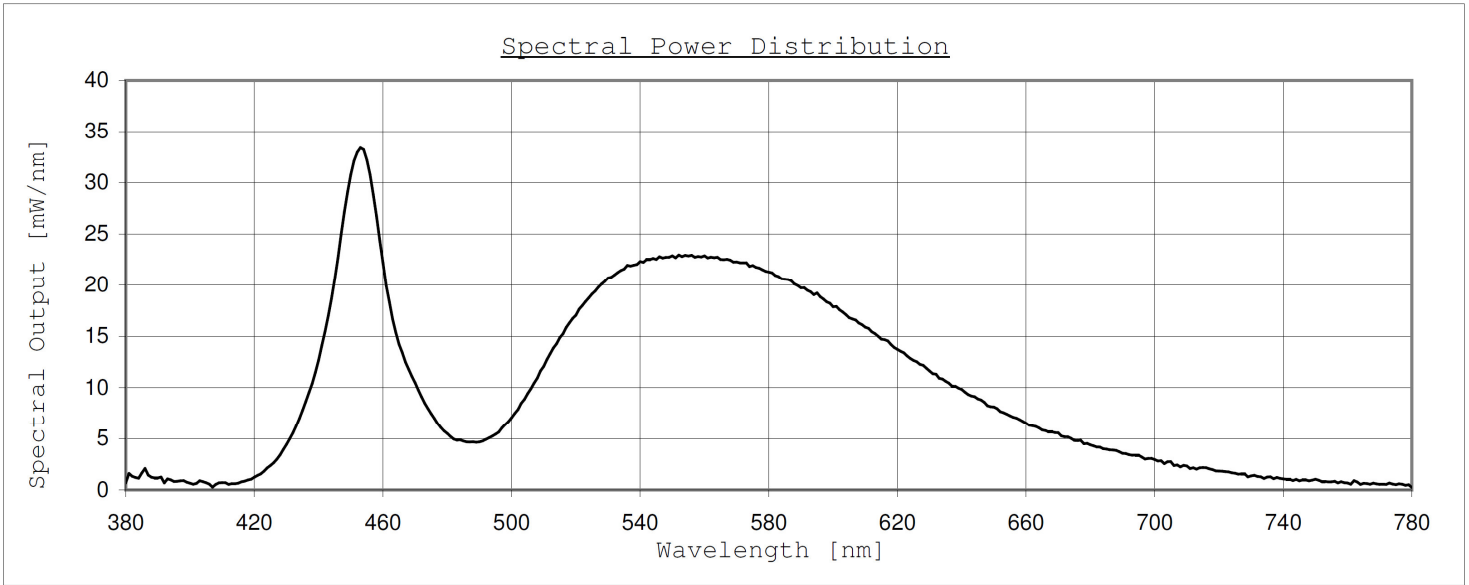
SPECTRAL MEASUREMENTS

X: 0.3428
y: 0.3742
u/u': 0.2015
v: 0.3299
v': 0.4949
Duv: 0.0120
CRI (R_a): 69.7
CRI (R_g): -42.0
CCT: 5143 K
RADIANT FLUX: 3928 mW

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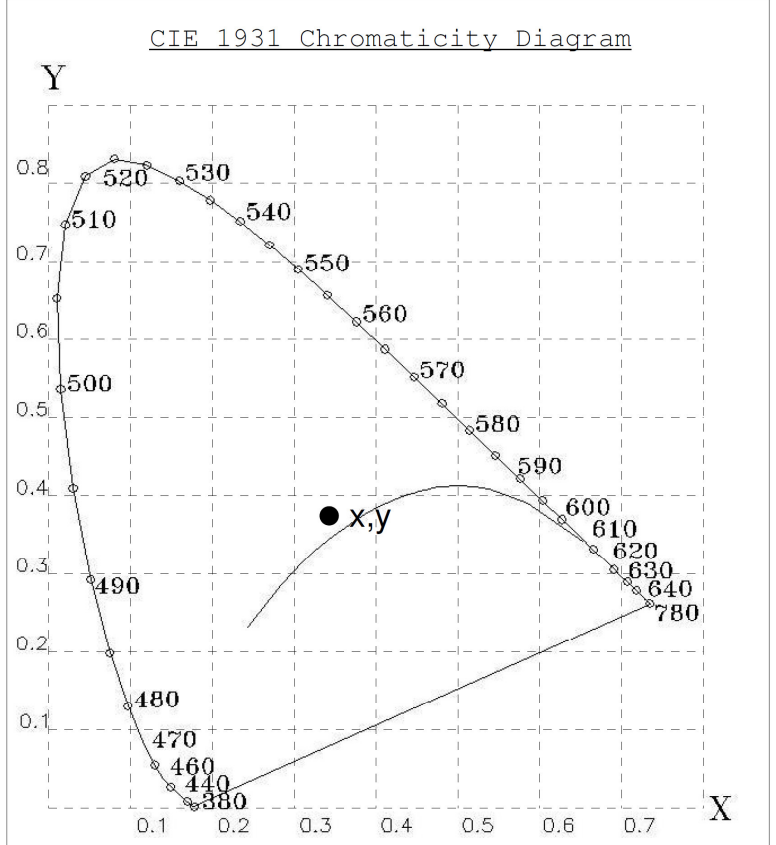
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Tabulated Spectral Power Distribution

Wavelength [nm]	[mW/nm]	Wavelength [nm]	[mW/nm]
380	0.68170	590	19.72618
390	1.17321	600	17.87401
400	0.65552	610	15.88688
410	0.71414	620	13.72701
420	1.24381	630	11.63280
430	4.43151	640	9.83613
440	12.71065	650	8.12829
450	30.77590	660	6.52416
460	22.22762	670	5.57136
470	10.48695	680	4.39138
480	5.50388	690	3.56495
490	4.67928	700	2.95581
500	7.07337	710	2.33521
510	12.08015	720	1.84331
520	17.04915	730	1.36731
530	20.70529	740	1.07498
540	22.32376	750	1.04242
550	22.87975	760	0.67844
560	22.87923	770	0.54817
570	22.28337	780	0.24712
580	21.29619		

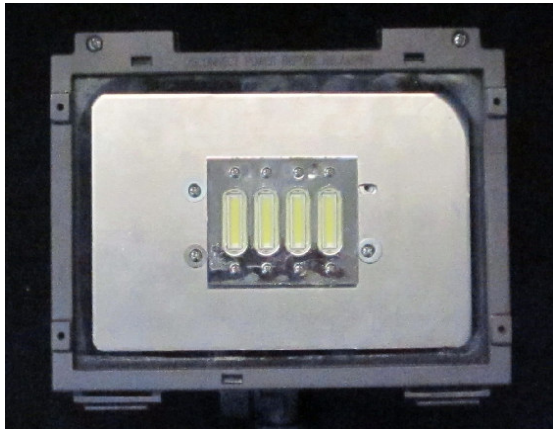


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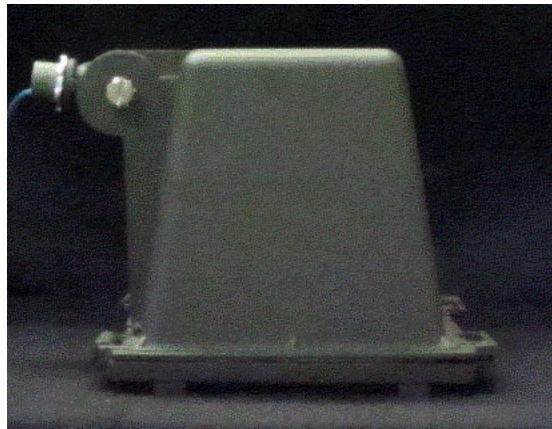
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LUMINOUS OPENING



SIDE VIEW



All testing was conducted in accordance with LM-79-08,

Approved Method: Electrical and Photometric Measurements of Solid-State Lighting Products as published by the Illuminating Engineering Society of North America (IESNA).

The condition of the item tested was new. Stabilization time before testing exceeded 16 hours.

The test results (luminous distribution and flux) were obtained by using a Lighting Sciences series 6000 Type C Moving Mirror Goniophotometer

- The photometric reference standard used is a set of three incandescent luminous intensity standard lamps calibrated and traceable to the U.S. National Institute of Standards and Technology.

The test results (colorimetric and luminous flux) were obtained by using a Lighting Sciences model 4000 Integrating Sphere of either 1 or 2 meters diameter, having an internal reflectance exceeding 0.80. 4π geometry was used. Correction factors were applied for spectral mismatch and self-absorption. The spectroradiometer employed was a LSC model 500E having a bandwidth of .84.

- The photometric reference standard used is a set of three incandescent luminous flux standard lamps calibrated and traceable to the U.S. National Institute of Standards and Technology.
- The colorimetric reference standard used is an incandescent spectral standard lamp calibrated and traceable to the U.S. National Institute of Standards and Technology.

Power measurements were obtained with a Yokogawa WT210 power analyzer.

Ambient temperature during testing was $25^{\circ}\text{C} \pm 1^{\circ}\text{C}$, measured using an Omega model DP460.

Calibration certificates are on file at the laboratories of Lighting Sciences Inc.