



UL LLC  
1075 W Lambert Rd Suite B  
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## Indoor Distribution Test Report

Relevant Standards  
IES LM-79-2008  
ANSI C82.77-2002

Prepared For  
**Sonneman - A Way of Light**

Nicolas Carmichael  
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Newburgh, NY 12550-9369  
United States

Catalog Number  
**CST.2902.01**

Order Number  
11281216  
Test Number  
1253400

Test Date

2016-06-07

Prepared By

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Approved By

Eric Gaudreau, Senior Engineering Associate

The results contained in this report pertain only to the tested sample.  
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**Luminaire Description:** Spherical aluminum housing with clear glass lens attached to CY.2913.01-KT  
**Lamp:** White LEDS with patterned lens below  
**Mounting:** Pendant  
**Ballast/Driver:** L.T.F. TA60WA12LED-0000

#### Luminaire



#### Luminaire Characteristics

Luminous Diameter: 3.25 in.  
Luminous Height: 2.000 in.

#### Summary of Results

Total Luminaire Output:	176.4 Lumens
Luminaire Efficacy:	29.2 lm/w
Maximum Candela:	555 Candela

#### Test Conditions

Test Temperature:	24.8 °C
Voltage:	120.1 VAC
Current:	0.05250 A
Power:	6.034 W
Power Factor:	0.957
Frequency:	60 Hz
Current THD:	27.8 %

Laboratory results may not be representative of field performance  
Ballast factors have not been applied



## Distribution - Goniophotometer

### Distribution Test Conditions

Temperature	Voltage	Current	Power	Power Factor	Frequency	Current THD
24.8 °C	120.1 VAC	0.05250 A	6.034 W	0.957	60 Hz	27.8 %

### Summary of Results

#### Spacing Criteria

0-180: 0.45

90-270: 0.45

#### Total Lumen Output:

176.4 Lumens

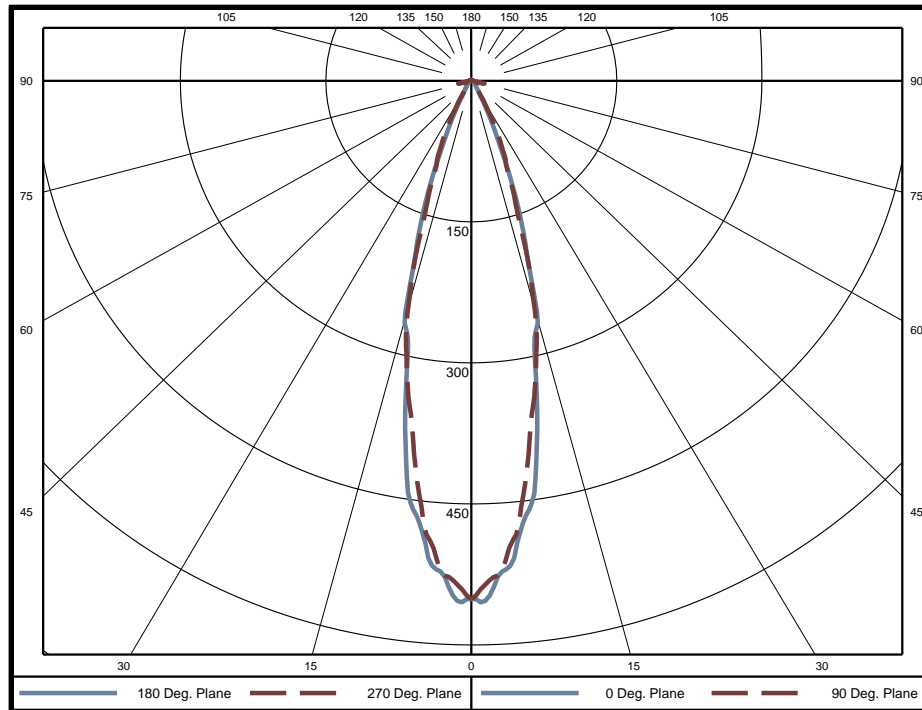
#### Luminaire Efficacy:

29.2 lm/w

#### Maximum Candela:

555 Candela

### Polar Plot



### Zonal Lumen Summary

Zone	Lumens	% of Luminaire	Zone	Lumens	% of Luminaire	Zone	Lumens	% of Luminaire
0-5	12.43	7.0%	60-65	1.64	0.9%	120-125	0.25	0.1%
5-10	31.36	17.8%	65-70	2.38	1.3%	125-130	0.15	0.1%
10-15	36.67	20.8%	70-75	3.83	2.2%	130-135	0.14	0.1%
15-20	30.72	17.4%	75-80	3.80	2.2%	135-140	0.19	0.1%
20-25	20.04	11.4%	80-85	2.65	1.5%	140-145	0.24	0.1%
25-30	10.29	5.8%	85-90	0.95	0.5%	145-150	0.25	0.1%
30-35	4.82	2.7%	90-95	0.32	0.2%	150-155	0.20	0.1%
35-40	2.79	1.6%	95-100	0.29	0.2%	155-160	0.11	0.1%
40-45	2.32	1.3%	100-105	0.48	0.3%	160-165	0.05	0.0%
45-50	2.00	1.1%	105-110	0.65	0.4%	165-170	0.01	0.0%
50-55	1.71	1.0%	110-115	0.65	0.4%	170-175	0.00	0.0%
55-60	1.59	0.9%	115-120	0.44	0.2%	175-180	0	0.0%

Zone	Lumens	% of Luminaire
0-40	149	84.5%
0-60	157	88.9%
0-90	172	97.5%
90-180	4	2.5%



**Candela Tabulation**  
Horizontal Angle (Degrees)

Vertical Angle (Degrees)	0	22.5	45	67.5	90	112.5	135	157.5	180	202.5	225	247.5	270	292.5	315	337.5
	0	551.3	551.3	551.3	551.3	551.3	551.3	551.3	551.3	551.3	551.3	551.3	551.3	551.3	551.3	551.3
	5	509.8	494.9	502.7	491.4	491.0	491.4	502.7	494.9	509.8	494.9	502.7	491.4	491.0	491.4	502.7
	10	391.5	380.6	386.5	377.7	360.6	377.7	386.5	380.6	391.5	380.6	386.5	377.7	360.6	377.7	386.5
	15	266.4	243.5	238.6	245.9	255.9	245.9	238.6	243.5	266.4	243.5	238.6	245.9	255.9	245.9	238.6
	20	140.2	139.6	135.2	141.7	129.4	141.7	135.2	139.6	140.2	139.6	135.2	141.7	129.4	141.7	135.2
	25	55.5	64.4	62.7	61.6	71.3	61.6	62.7	64.4	55.5	64.4	62.7	61.6	71.3	61.6	62.7
	30	19.0	24.3	22.8	25.2	29.4	25.2	22.8	24.3	19.0	24.3	22.8	25.2	29.4	25.2	22.8
	35	10.7	11.0	11.2	9.8	10.4	9.8	11.2	11.0	10.7	11.0	11.2	9.8	10.4	9.8	11.2
	40	7.5	7.3	7.3	6.6	6.7	6.6	7.3	7.3	7.5	7.3	7.3	6.6	6.7	6.6	7.3
	45	5.5	5.8	5.7	5.4	5.3	5.4	5.7	5.8	5.5	5.8	5.7	5.4	5.3	5.4	5.7
	50	4.5	4.3	4.4	4.2	4.3	4.2	4.4	4.3	4.5	4.3	4.4	4.2	4.3	4.2	4.4
	55	3.9	3.9	3.6	3.7	3.4	3.7	3.6	3.9	3.9	3.9	3.6	3.7	3.4	3.7	3.6
	60	3.1	3.1	3.1	3.9	4.0	3.9	3.1	3.1	3.1	3.1	3.1	3.9	4.0	3.9	3.1
	65	4.3	3.4	3.6	3.5	2.8	3.5	3.6	3.4	4.3	3.4	3.6	3.5	2.8	3.5	3.6
	70	6.9	7.6	7.3	5.6	5.1	5.6	7.3	7.6	6.9	7.6	7.3	5.6	5.1	5.6	7.3
	75	5.3	6.9	10.6	7.1	7.6	7.1	10.6	6.9	5.3	6.9	10.6	7.1	7.6	7.1	10.6
	80	4.4	4.4	6.8	6.2	6.6	6.2	6.8	4.4	4.4	4.4	6.8	6.2	6.6	6.2	6.8
	85	3.3	5.1	3.0	2.1	2.0	2.1	3.0	5.1	3.3	5.1	3.0	2.1	2.0	2.1	3.0
	90	1.1	1.0	1.0	0.7	0.5	0.7	1.0	1.0	1.1	1.0	1.0	0.7	0.5	0.7	1.0
	95	0.6	0.5	0.6	0.4	0.2	0.4	0.6	0.5	0.6	0.5	0.6	0.4	0.2	0.4	0.6
	100	0.6	0.6	0.6	0.9	0.4	0.9	0.6	0.6	0.6	0.6	0.6	0.9	0.4	0.9	0.6
	105	0.6	1.1	1.1	1.4	1.1	1.4	1.1	0.6	1.1	1.1	1.1	1.4	1.1	1.4	1.1
	110	1.0	1.4	1.5	1.3	1.3	1.3	1.5	1.4	1.0	1.4	1.5	1.3	1.3	1.3	1.5
	115	1.0	1.0	1.1	1.1	1.2	1.1	1.1	1.0	1.0	1.0	1.1	1.1	1.2	1.1	1.1
	120	0.9	0.8	0.5	0.7	0.6	0.7	0.5	0.8	0.9	0.8	0.5	0.7	0.6	0.7	0.5
	125	0.5	0.5	0.4	0.4	0.3	0.4	0.4	0.5	0.5	0.5	0.4	0.4	0.3	0.4	0.4
	130	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
	135	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
	140	0.8	0.6	0.6	0.6	0.5	0.6	0.6	0.6	0.8	0.6	0.6	0.6	0.5	0.6	0.6
	145	0.9	0.9	0.8	0.8	0.7	0.8	0.8	0.9	0.9	0.9	0.8	0.8	0.7	0.8	0.8
	150	0.9	0.9	0.9	0.8	0.7	0.8	0.9	0.9	0.9	0.9	0.9	0.8	0.7	0.8	0.9
	155	0.6	0.7	0.7	0.7	0.6	0.7	0.7	0.7	0.6	0.7	0.7	0.7	0.6	0.7	0.7
	160	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
	165	0.2	0.2	0.2	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.2	0.2
	170	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	175	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	180	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

**Average Luminance (cd/m<sup>2</sup>)**  
Horizontal Angle (Degrees)

Vertical Angle (Degrees)	0	45	90
	0	103000	103000
	45	1098	1053
	55	814	714
	65	975	631
	75	1309	1854
	85	912	534



### Utilization of Lumens - Zonal Cavity Method

Effective Floor Cavity Reflectance 20%																		
Ceiling Cavity Reflectance	80				70				50			30			10			0
Wall Reflectance	70	50	30	10	70	50	30	10	50	30	10	50	30	10	50	30	10	0
Room Cavity Ratio (RCR)	** Values are expressed as Lumens delivered to the task surface **																	
0	209	209	209	209	204	204	204	204	194	194	194	184	184	184	176	176	176	172
1	197	192	187	182	193	188	183	179	180	176	173	172	169	167	165	163	161	158
2	188	179	171	165	183	175	168	163	169	163	158	163	158	154	157	154	150	147
3	179	168	159	152	176	165	157	151	160	153	148	155	150	145	151	146	142	139
4	172	159	150	143	169	157	148	142	153	145	139	149	142	137	145	140	135	133
5	165	152	142	135	162	150	141	134	146	138	133	143	136	131	140	134	130	127
6	159	145	135	128	156	143	134	128	140	133	127	138	131	126	135	129	124	122
7	154	139	130	123	151	138	129	122	135	127	122	133	126	121	130	124	120	117
8	148	134	124	118	146	132	124	118	130	122	117	128	121	116	126	120	115	113
9	143	129	120	114	141	128	119	113	126	118	113	124	117	112	122	116	112	109
10	139	124	115	110	137	123	115	109	122	114	109	120	113	108	119	112	108	106

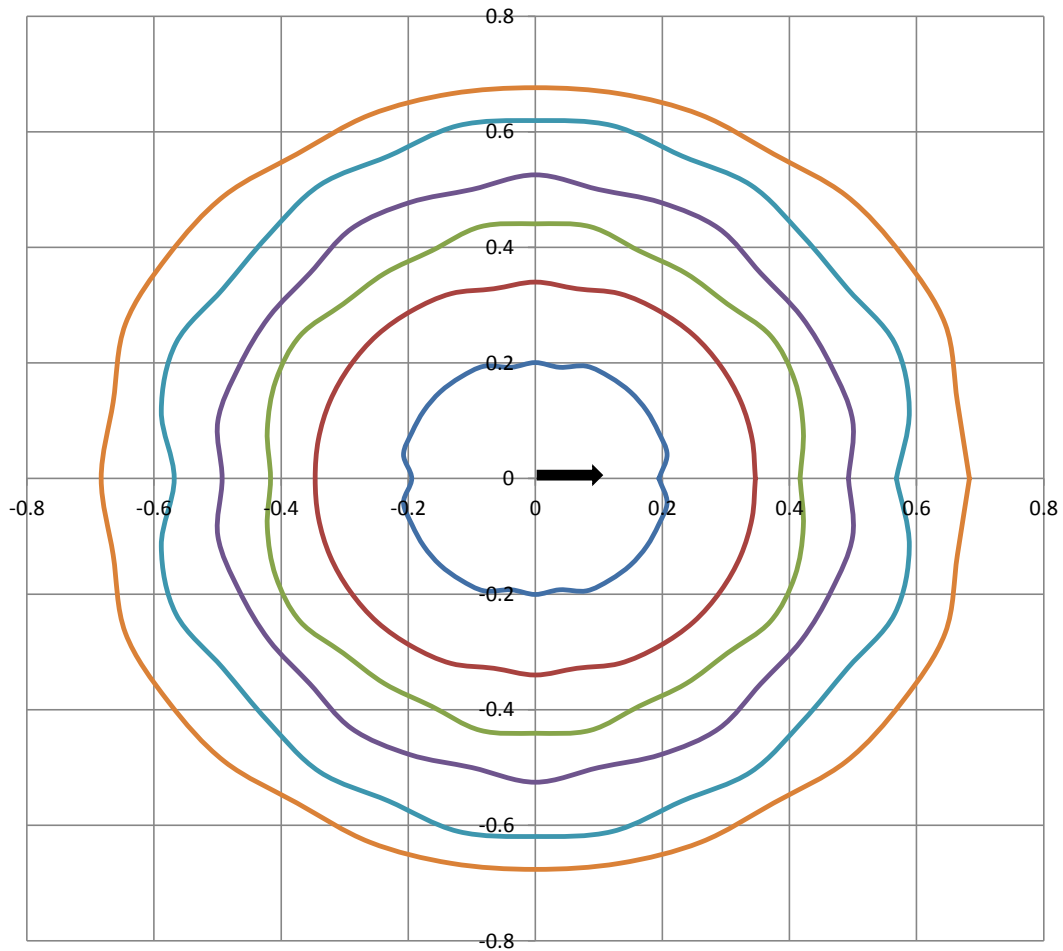
Beam and Field Information	
CIE Type:	Direct
Center Beam Intensity:	551.3 Candela
Central Cone Intensity:	528 Candela
Beam Flux:	72.5 Lumens
Beam Angle (0-180):	28.0 Degrees
Beam Angle (90-270):	28.4 Degrees
Field Angle (0-180):	50.1 Degrees
Field Angle (90-270):	52.9 Degrees

Cone of Light Tabulation			
Mounting Height (Feet)		Footcandles at Nadir	Diameter (Feet)
4.00		34.5	1.85
6.00		15.3	2.78
8.00		8.61	3.70
10.0		5.51	4.63
12.0		3.83	5.56
14.0		2.81	6.48
16.0		2.15	7.41



## ISOFootcandle Plot

Mounting Height - 8 Feet



Grid Lines in Units of Mounting Height

5 fc    2 fc    1 fc    0.5 fc    0.2 fc    0.1 fc