



UL LLC  
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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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United States

**Catalog Number**  
**CST.2901.01**

Order Number  
11281216  
Test Number  
1253395

Test Date

2016-06-01

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: 2.00 in.  
Luminous Height: 1.000 in.

**Summary of Results**

Total Luminaire Output:	123.6 Lumens
Luminaire Efficacy:	26.7 lm/w
Maximum Candela:	418 Candela

**Test Conditions**

Test Temperature:	24.3 °C
Voltage:	120.1 VAC
Current:	0.04030 A
Power:	4.634 W
Power Factor:	0.956
Frequency:	60 Hz
Current THD:	26.8 %

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
24.3 °C	120.1 VAC	0.04030 A	4.634 W	0.956	60 Hz	26.8 %

### Summary of Results

#### Spacing Criteria

0-180: 0.53

90-270: 0.41

#### Total Lumen Output:

123.6 Lumens

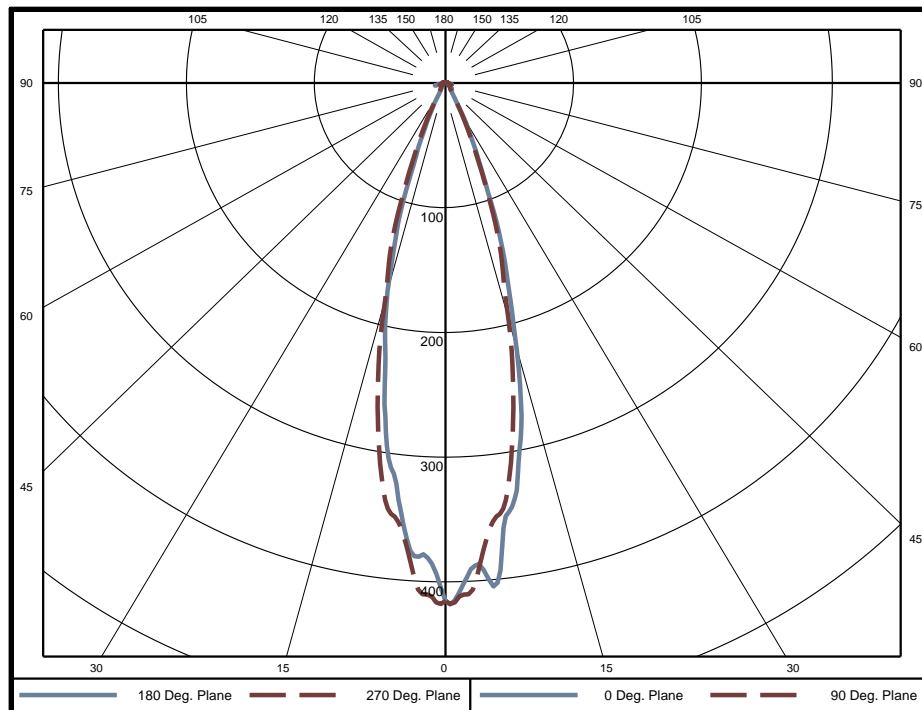
#### Luminaire Efficacy:

26.7 lm/w

#### Maximum Candela:

418 Candela

### Polar Plot



### Zonal Lumen Summary

Zone	Lumens	% of Luminaire	Zone	Lumens	% of Luminaire	Zone	Lumens	% of Luminaire
0-5	9.40	7.6%	60-65	1.12	0.9%	120-125	0.12	0.1%
5-10	23.70	19.2%	65-70	1.27	1.0%	125-130	0.09	0.1%
10-15	28.14	22.8%	70-75	1.68	1.4%	130-135	0.12	0.1%
15-20	22.89	18.5%	75-80	1.92	1.6%	135-140	0.11	0.1%
20-25	13.05	10.6%	80-85	0.92	0.7%	140-145	0.03	0.0%
25-30	5.85	4.7%	85-90	0.38	0.3%	145-150	0	0.0%
30-35	2.56	2.1%	90-95	0.29	0.2%	150-155	0	0.0%
35-40	1.89	1.5%	95-100	0.44	0.4%	155-160	0	0.0%
40-45	1.74	1.4%	100-105	0.55	0.4%	160-165	0	0.0%
45-50	1.65	1.3%	105-110	0.56	0.5%	165-170	0	0.0%
50-55	1.39	1.1%	110-115	0.38	0.3%	170-175	0	0.0%
55-60	1.22	1.0%	115-120	0.21	0.2%	175-180	0	0.0%

Zone	Lumens	% of Luminaire
0-40	107	87.0%
0-60	113	91.8%
0-90	121	97.7%
90-180	3	2.3%



**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	414.7	414.7	414.7	414.7	414.7	414.7	414.7	414.7	414.7	414.7	414.7	414.7	414.7	414.7	414.7
	5	398.5	389.8	402.6	378.3	366.3	370.8	383.2	378.2	356.3	378.2	383.2	370.8	366.3	378.3	402.6
	10	331.5	317.0	296.2	300.6	297.2	286.8	281.9	269.2	261.2	269.2	281.9	286.8	297.2	300.6	296.2
	15	223.4	195.6	189.3	185.9	182.7	195.7	178.7	180.7	160.3	180.7	178.7	195.7	182.7	185.9	189.3
	20	124.9	98.7	99.7	95.0	100.6	107.9	93.0	84.4	68.2	84.4	93.0	107.9	100.6	95.0	99.7
	25	52.3	42.0	34.5	35.4	40.7	42.1	37.9	33.9	25.5	33.9	37.9	42.1	40.7	35.4	34.5
	30	17.5	13.0	11.1	12.0	14.2	15.1	11.6	9.6	7.7	9.6	11.6	15.1	14.2	12.0	11.1
	35	8.7	7.1	6.1	6.5	6.9	7.3	6.7	5.3	5.0	5.3	6.7	7.3	6.9	6.5	6.1
	40	6.1	5.5	5.2	5.0	5.2	4.9	5.0	4.7	4.1	4.7	5.0	4.9	5.2	5.0	5.2
	45	6.4	4.5	4.1	4.0	4.5	4.0	4.3	4.3	3.3	4.3	4.3	4.0	4.5	4.0	4.1
	50	4.5	3.9	4.1	3.3	3.4	4.0	4.1	3.6	2.7	3.6	4.1	4.0	3.4	3.3	4.1
	55	3.0	3.1	2.8	2.6	2.6	2.7	3.1	2.8	2.4	2.8	3.1	2.7	2.6	2.6	2.8
	60	3.0	3.1	2.1	1.8	2.4	3.1	2.8	2.4	1.6	2.4	2.8	3.1	2.4	1.8	2.1
	65	2.3	2.4	1.7	1.7	2.3	3.1	2.4	2.1	1.3	2.1	2.4	3.1	2.3	1.7	1.7
	70	2.2	2.8	2.7	2.7	3.2	4.1	2.6	2.5	2.0	2.5	2.6	4.1	3.2	2.7	2.7
	75	2.7	4.5	3.1	5.4	4.1	4.0	2.8	2.3	5.7	2.3	2.8	4.0	4.1	5.4	3.1
	80	3.2	3.2	2.3	3.2	2.2	3.4	2.0	1.7	3.2	1.7	2.0	3.4	2.2	3.2	2.3
	85	1.3	1.2	0.8	1.0	0.9	1.2	0.9	0.7	0.7	0.7	0.9	1.2	0.9	1.0	0.8
	90	0.5	0.6	0.4	0.6	0.7	0.5	0.5	0.3	0.3	0.3	0.5	0.5	0.7	0.6	0.4
	95	0.3	0.4	0.6	0.9	0.7	0.7	1.0	0.5	1.1	0.5	1.0	0.7	0.7	0.9	0.6
	100	0.7	0.6	0.8	1.0	1.0	1.0	0.6	0.9	1.0	0.9	0.6	1.0	1.0	1.0	0.8
	105	1.1	1.0	1.0	1.0	0.9	1.4	1.5	1.3	1.4	1.3	1.5	1.4	0.9	1.0	1.0
	110	0.8	1.1	1.0	0.8	0.7	0.9	1.2	1.2	0.6	1.2	1.2	0.9	0.7	0.8	1.0
	115	0.7	0.7	0.6	0.4	0.5	0.6	0.7	0.6	0.0	0.6	0.7	0.6	0.5	0.4	0.6
	120	0.4	0.4	0.3	0.2	0.4	0.5	0.4	0.2	0.1	0.2	0.4	0.5	0.4	0.2	0.3
	125	0.2	0.1	0.1	0.3	0.3	0.3	0.3	0.1	0.1	0.1	0.3	0.3	0.3	0.3	0.1
	130	0.1	0.2	0.1	0.3	0.4	0.4	0.3	0.2	0.2	0.2	0.3	0.4	0.4	0.3	0.1
	135	0.1	0.1	0.1	0.2	0.5	0.6	0.4	0.4	0.2	0.4	0.4	0.6	0.5	0.2	0.1
	140	0.0	0.0	0.0	0.1	0.4	0.6	0.3	0.3	0.1	0.3	0.3	0.6	0.4	0.1	0.0
	145	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
	150	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
	155	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
	160	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
	165	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
	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	#VALUE!	#VALUE!
	45	#VALUE!	#VALUE!
	55	#VALUE!	#VALUE!
	65	#VALUE!	#VALUE!
	75	#VALUE!	#VALUE!
	85	#VALUE!	#VALUE!



### Utilization of Lumens - Zonal Cavity Method

Effective Floor Cavity Reflectance 20%																	
Ceiling Cavity Reflectance	80				70				50			30			10		
Wall Reflectance	70	50	30	10	70	50	30	10	50	30	10	50	30	10	50	30	10
Room Cavity Ratio (RCR)	** Values are expressed as Lumens delivered to the task surface **																
0	147	147	147	147	143	143	143	143	136	136	136	129	129	129	124	124	124
1	139	136	133	130	136	133	130	128	127	125	123	122	121	119	118	116	113
2	133	127	123	118	130	125	121	117	121	117	114	116	114	111	113	110	106
3	128	120	115	110	125	118	113	109	115	110	107	111	108	105	108	105	101
4	123	114	108	103	120	113	107	103	110	105	101	107	103	100	104	101	96
5	118	109	103	98	116	108	102	98	105	100	96	103	99	95	101	97	93
6	114	104	98	94	112	103	97	93	101	96	92	99	95	92	98	94	89
7	110	100	94	90	108	99	94	89	98	93	89	96	92	88	95	91	86
8	106	97	91	86	105	96	90	86	94	89	86	93	88	85	92	88	83
9	103	93	87	83	102	93	87	83	91	86	83	90	86	82	89	85	80
10	100	90	84	80	99	90	84	80	89	83	80	87	83	80	87	82	78

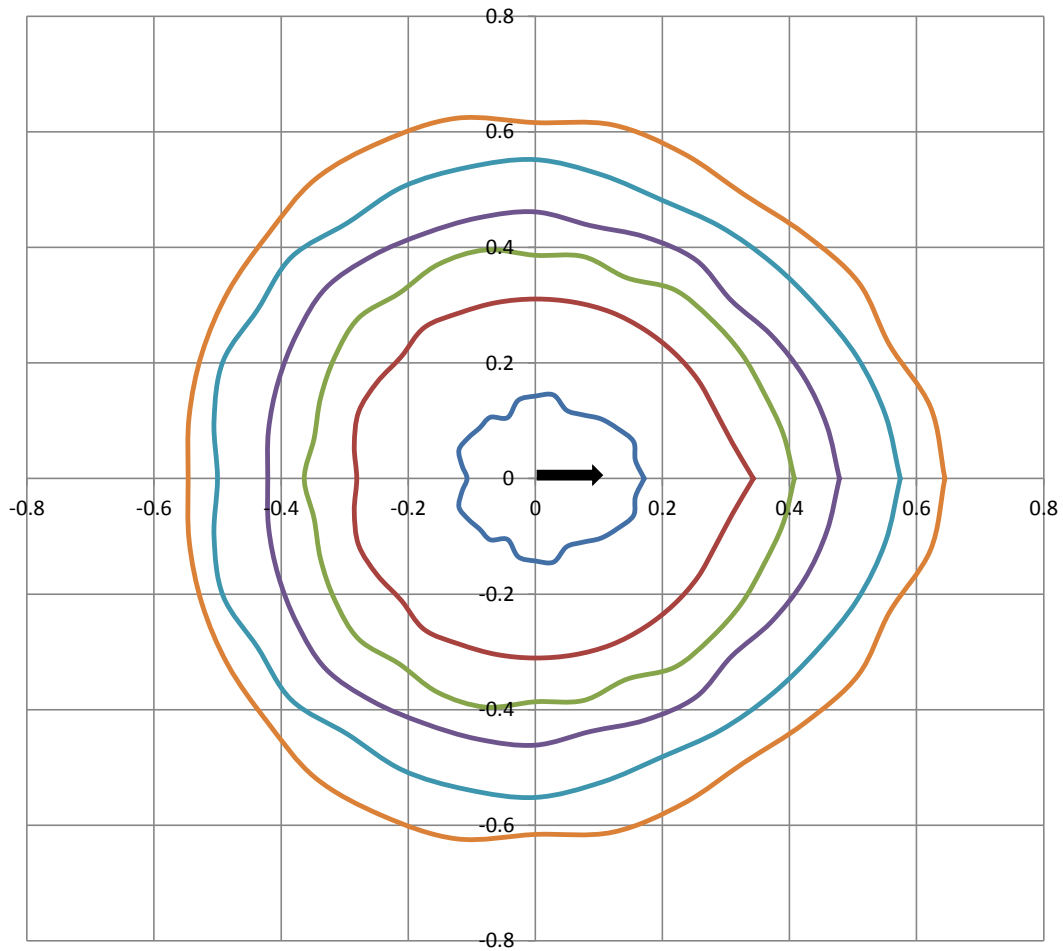
Beam and Field Information	
CIE Type:	Direct
Center Beam Intensity:	414.7 Candela
Central Cone Intensity:	399 Candela
Beam Flux:	56.3 Lumens
Beam Angle (0-180):	28.1 Degrees
Beam Angle (90-270):	28.1 Degrees
Field Angle (0-180):	48.9 Degrees
Field Angle (90-270):	49.8 Degrees

Cone of Light Tabulation			
Mounting Height (Feet)		Footcandles at Nadir	Diameter (Feet)
4.00		25.9	1.88
6.00		11.5	2.83
8.00		6.48	3.77
10.0		4.15	4.71
12.0		2.88	5.65
14.0		2.12	6.60
16.0		1.62	7.54



## 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