



UL LLC  
1075 W Lambert Rd Suite B  
Brea, CA 92821

## Indoor Distribution Test Report

Relevant Standards  
IES LM-41-2014  
IES LM-9-2009  
ANSI C82.77-2002

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

Nicolas Carmichael  
106 Pierces Rd  
Newburgh, NY 12550-9369  
United States

Catalog Number  
**CST.2903.01**

Order Number  
11281216  
Test Number  
1253396

Test Date

2016-06-03

Prepared By

Khang Nguyen, Technician

Approved By

Eric Gaudreau, Senior Engineering Associate

The results contained in this report pertain only to the tested sample.  
This report shall not be reproduced, except in full, without written approval of Underwriters Laboratories.  
This report must not be used by the client to claim product certification, approval, or endorsement by  
NVLAP, NIST, or any agency of the Federal Government.



**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: 3.75 in.  
Luminous Height: 1.250 in.

**Summary of Results**

Total Luminaire Output:	237.0 Lumens
Luminaire Efficacy:	31.9 lm/w
Maximum Candela:	962 Candela

**Test Conditions**

Test Temperature:	25.1 °C
Voltage:	120.0 VAC
Current:	0.06460 A
Power:	7.430 W
Power Factor:	0.958
Frequency:	60 Hz
Current THD:	28.1 %

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
25.1 °C	120.0 VAC	0.06460 A	7.430 W	0.958	60 Hz	28.1 %

### Summary of Results

#### Spacing Criteria

0-180: 0.42

90-270: 0.42

#### Total Lumen Output:

237.0 Lumens

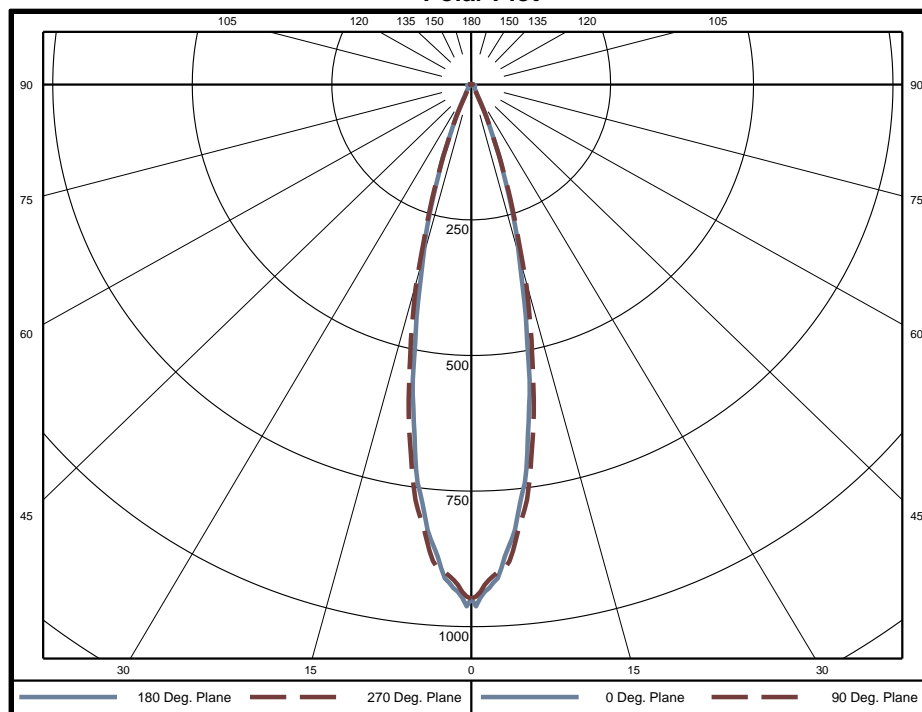
#### Luminaire Efficacy:

31.9 lm/w

#### Maximum Candela:

962 Candela

### Polar Plot



### Zonal Lumen Summary

Zone	Lumens	% of Luminaire	Zone	Lumens	% of Luminaire	Zone	Lumens	% of Luminaire
0-5	21.37	9.0%	60-65	1.40	0.6%	120-125	0.36	0.2%
5-10	52.13	22.0%	65-70	1.68	0.7%	125-130	0.13	0.1%
10-15	56.72	23.9%	70-75	2.59	1.1%	130-135	0.11	0.0%
15-20	41.53	17.5%	75-80	3.64	1.5%	135-140	0.15	0.1%
20-25	21.70	9.2%	80-85	3.34	1.4%	140-145	0.18	0.1%
25-30	8.27	3.5%	85-90	1.47	0.6%	145-150	0.18	0.1%
30-35	4.22	1.8%	90-95	0.58	0.2%	150-155	0.13	0.1%
35-40	3.27	1.4%	95-100	0.47	0.2%	155-160	0.08	0.0%
40-45	2.74	1.2%	100-105	0.72	0.3%	160-165	0.04	0.0%
45-50	2.19	0.9%	105-110	0.86	0.4%	165-170	0.01	0.0%
50-55	1.67	0.7%	110-115	0.90	0.4%	170-175	0.00	0.0%
55-60	1.46	0.6%	115-120	0.68	0.3%	175-180	0	0.0%

Zone	Lumens	% of Luminaire
0-40	209	88.3%
0-60	217	91.7%
0-90	231	97.6%
90-180	6	2.4%



### 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	948.2	948.2	948.2	948.2	948.2	948.2	948.2	948.2	948.2	948.2	948.2	948.2	948.2	948.2	948.2
	5	842.0	838.4	849.2	848.2	863.9	848.2	849.2	838.4	842.0	838.4	849.2	848.2	863.9	848.2	849.2
	10	603.4	593.8	613.2	638.8	645.7	638.8	613.2	593.8	603.4	593.8	613.2	638.8	645.7	638.8	613.2
	15	340.4	350.1	357.8	367.6	387.1	367.6	357.8	350.1	340.4	350.1	357.8	367.6	387.1	367.6	357.8
	20	165.3	162.3	162.9	173.6	167.6	173.6	162.9	162.3	165.3	162.3	162.9	173.6	167.6	173.6	162.9
	25	64.1	57.9	56.7	53.9	56.6	53.9	56.7	57.9	64.1	57.9	56.7	53.9	56.6	53.9	56.7
	30	21.0	20.4	18.8	17.1	17.9	17.1	18.8	20.4	21.0	20.4	18.8	17.1	17.9	17.1	18.8
	35	13.6	11.8	11.6	10.7	10.1	10.7	11.6	11.8	13.6	11.8	11.6	10.7	10.1	10.7	11.6
	40	9.3	8.7	8.8	7.9	7.7	7.9	8.8	8.7	9.3	8.7	8.8	7.9	7.7	7.9	8.8
	45	6.6	6.6	6.6	6.1	6.0	6.1	6.6	6.6	6.6	6.6	6.6	6.1	6.0	6.1	6.6
	50	4.7	4.8	4.5	4.5	4.3	4.5	4.5	4.8	4.7	4.8	4.5	4.5	4.3	4.5	4.5
	55	3.6	3.6	3.3	3.1	3.1	3.1	3.3	3.6	3.6	3.6	3.3	3.1	3.1	3.1	3.3
	60	3.5	3.1	2.8	2.8	3.1	2.8	2.8	3.1	3.5	3.1	2.8	2.8	3.1	2.8	2.8
	65	3.2	3.3	2.9	2.9	2.6	2.9	2.9	3.3	3.2	3.3	2.9	2.9	2.6	2.9	2.9
	70	4.0	4.4	3.5	3.3	3.3	3.3	3.5	4.4	4.0	4.4	3.5	3.3	3.3	3.3	3.5
	75	6.1	7.7	6.0	6.2	4.8	6.2	6.0	7.7	6.1	7.7	6.0	6.2	4.8	6.2	6.0
	80	6.1	7.4	6.6	6.6	7.2	6.6	6.6	7.4	6.1	7.4	6.6	6.6	7.2	6.6	6.6
	85	5.0	5.0	4.1	4.1	4.0	4.1	4.1	5.0	5.0	5.0	4.1	4.1	4.0	4.1	4.1
	90	2.0	1.4	1.5	1.6	1.0	1.6	1.5	1.4	2.0	1.4	1.5	1.6	1.0	1.6	1.5
	95	1.1	1.0	0.8	0.8	0.5	0.8	0.8	1.0	1.1	1.0	0.8	0.8	0.5	0.8	0.8
	100	1.2	0.9	1.0	1.0	1.2	1.0	1.0	0.9	1.2	0.9	1.0	1.0	1.2	1.0	1.0
	105	2.0	1.6	1.4	1.5	1.7	1.5	1.4	1.6	2.0	1.6	1.4	1.5	1.7	1.5	1.4
	110	1.9	1.9	1.8	1.5	1.5	1.5	1.8	1.9	1.9	1.8	1.5	1.5	1.5	1.5	1.8
	115	2.0	1.7	1.7	1.6	1.9	1.6	1.7	1.7	2.0	1.7	1.7	1.6	1.9	1.6	1.7
	120	1.1	1.0	1.1	1.1	1.1	1.1	1.1	1.0	1.1	1.0	1.1	1.1	1.1	1.1	1.1
	125	0.4	0.5	0.4	0.5	0.4	0.5	0.4	0.5	0.4	0.5	0.4	0.5	0.4	0.5	0.4
	130	0.2	0.2	0.2	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.2
	135	0.3	0.3	0.3	0.3	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.3	0.3
	140	0.4	0.4	0.5	0.5	0.5	0.5	0.5	0.4	0.4	0.4	0.5	0.5	0.5	0.5	0.4
	145	0.5	0.6	0.6	0.6	0.5	0.6	0.6	0.6	0.5	0.6	0.6	0.6	0.5	0.6	0.6
	150	0.6	0.6	0.6	0.6	0.5	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.5	0.6	0.6
	155	0.4	0.5	0.5	0.4	0.4	0.4	0.5	0.5	0.4	0.5	0.5	0.4	0.4	0.4	0.5
	160	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.3	0.3	0.3	0.3	0.3	0.3
	165	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	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	133100	133100
	45	1418	1300
	55	749	645
	65	651	527
	75	1272	1017
	85	1119	891



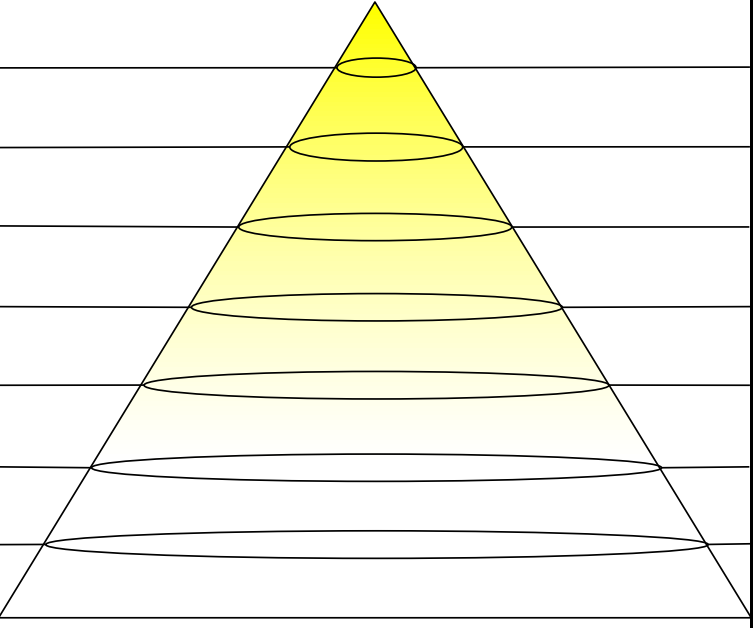
### Utilization of Lumens - Zonal Cavity Method

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	281	281	281	281	274	274	274	274	260	260	260	248	248	248	237	237	237	231
1	267	260	254	249	261	255	249	244	244	240	236	234	231	228	225	223	220	216
2	256	245	236	228	250	240	232	225	232	225	219	224	219	214	217	213	209	205
3	246	232	222	213	241	229	219	211	222	214	207	215	209	203	210	204	200	196
4	237	222	210	202	233	219	208	200	213	204	197	208	201	195	203	197	192	188
5	229	212	201	192	225	210	199	191	205	196	189	201	193	187	197	190	185	182
6	222	204	193	184	218	202	191	184	198	189	182	195	187	180	191	184	179	176
7	215	197	186	178	212	195	185	177	192	183	176	189	181	174	186	179	173	170
8	208	190	179	171	205	189	178	171	186	177	170	184	175	169	181	174	168	165
9	202	184	173	166	200	183	173	166	181	171	165	178	170	164	176	169	163	161
10	197	179	168	161	194	178	168	161	176	166	160	174	165	159	172	164	159	156

#### Beam and Field Information

CIE Type:	Direct
Center Beam Intensity:	948.2 Candela
Central Cone Intensity:	908 Candela
Beam Flux:	104.8 Lumens
Beam Angle (0-180):	24.6 Degrees
Beam Angle (90-270):	26.4 Degrees
Field Angle (0-180):	45.4 Degrees
Field Angle (90-270):	45.5 Degrees

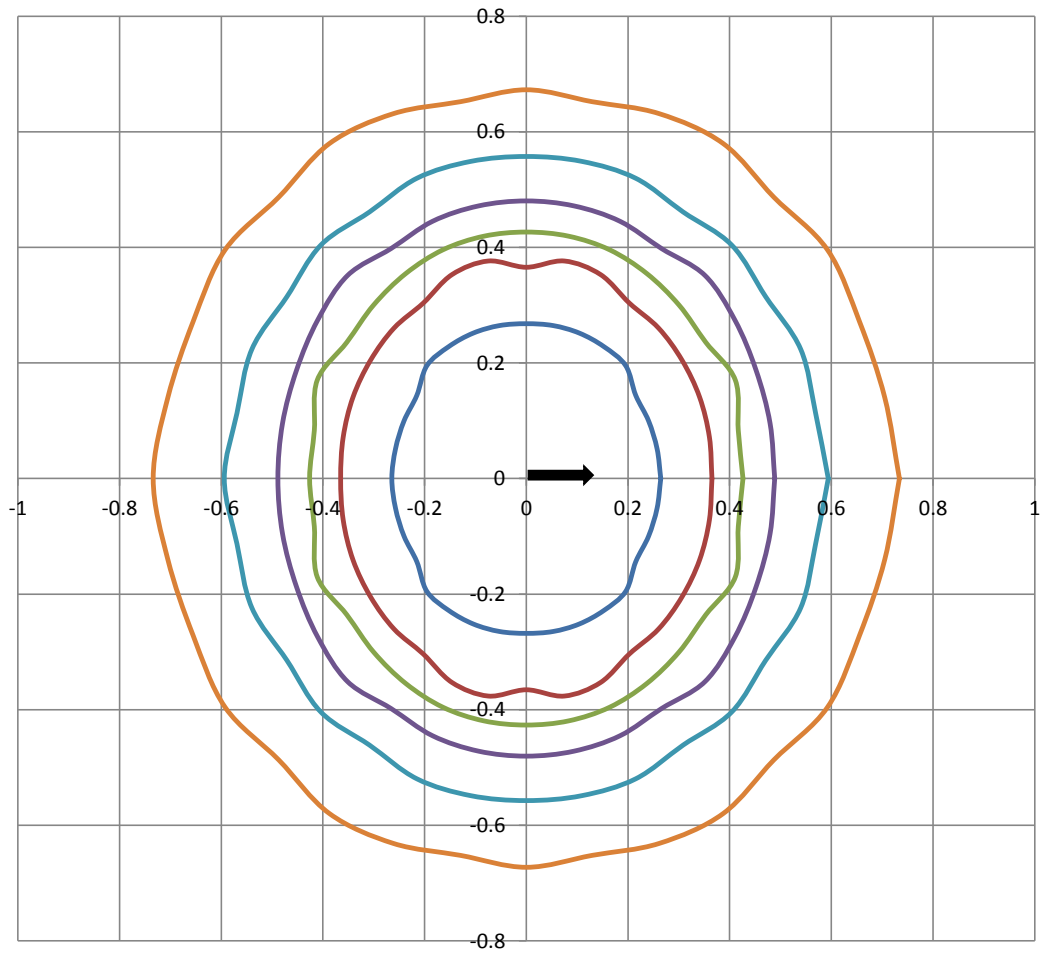
#### Cone of Light Tabulation

Mounting Height (Feet)		Footcandles at Nadir	Diameter (Feet)
4.00		59.3	1.71
6.00		26.3	2.56
8.00		14.8	3.42
10.0		9.48	4.27
12.0		6.58	5.13
14.0		4.84	5.98
16.0		3.70	6.84



## 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