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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

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United States

Catalog Number
CST.2901.13

Order Number
11281216
Test Number
1253399

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 half diffuse and half 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: 2.50 in.
Luminous Height: 1.500 in.

Summary of Results

Total Luminaire Output:	92.74 Lumens
Luminaire Efficacy:	19.7 lm/w
Maximum Candela:	20 Candela

Test Conditions

Test Temperature:	24.8 °C
Voltage:	120.1 VAC
Current:	0.04110 A
Power:	4.715 W
Power Factor:	0.955
Frequency:	60 Hz
Current THD:	27.1 %

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
24.8 °C	120.1 VAC	0.04110 A	4.715 W	0.955	60 Hz	27.1 %

Summary of Results

Spacing Criteria

0-180: 1.35

90-270: 1.35

Total Lumen Output:

92.74 Lumens

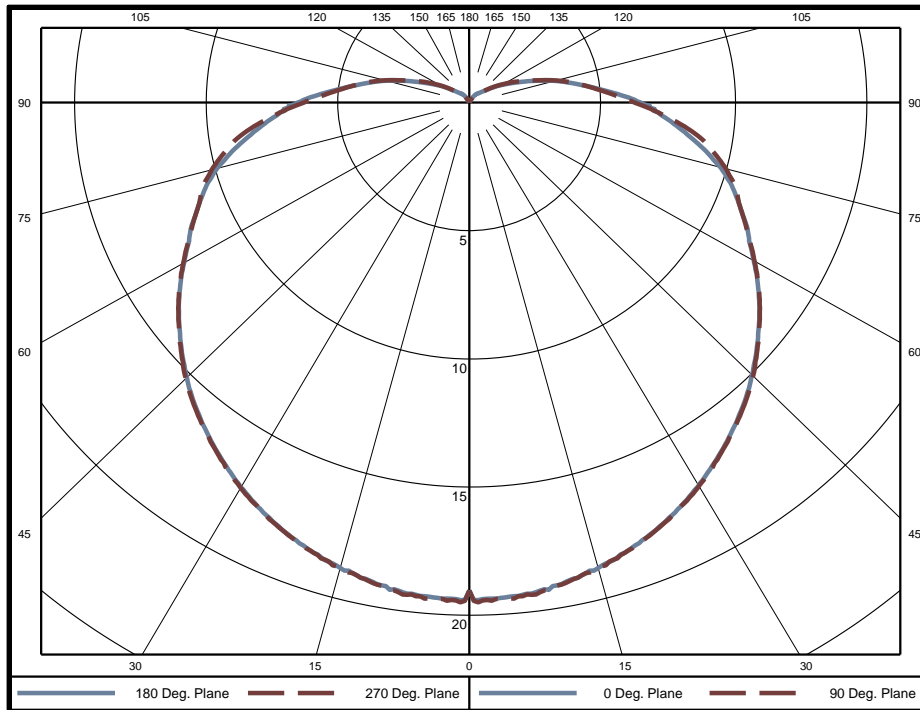
Luminaire Efficacy:

19.7 lm/w

Maximum Candela:

20 Candela

Polar Plot



Zonal Lumen Summary

Zone	Lumens	% of Luminaire	Zone	Lumens	% of Luminaire	Zone	Lumens	% of Luminaire
0-5	0.464	0.5%	60-65	5.849	6.3%	120-125	0.560	0.6%
5-10	1.379	1.5%	65-70	5.669	6.1%	125-130	0.382	0.4%
10-15	2.252	2.4%	70-75	5.453	5.9%	130-135	0.258	0.3%
15-20	3.069	3.3%	75-80	5.082	5.5%	135-140	0.181	0.2%
20-25	3.812	4.1%	80-85	4.513	4.9%	140-145	0.124	0.1%
25-30	4.463	4.8%	85-90	3.817	4.1%	145-150	0.072	0.1%
30-35	5.008	5.4%	90-95	3.127	3.4%	150-155	0.030	0.0%
35-40	5.442	5.9%	95-100	2.536	2.7%	155-160	0.005	0.0%
40-45	5.764	6.2%	100-105	2.020	2.2%	160-165	0.000	0.0%
45-50	5.957	6.4%	105-110	1.524	1.6%	165-170	0	0.0%
50-55	6.031	6.5%	110-115	1.108	1.2%	170-175	0	0.0%
55-60	5.996	6.5%	115-120	0.790	0.9%	175-180	0	0.0%

Zone	Lumens	% of Luminaire
0-40	26	27.9%
0-60	50	53.5%
0-90	80	86.3%
90-180	13	13.7%



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	19.04	19.04	19.04	19.04	19.04	19.04	19.04	19.04	19.04	19.04	19.04	19.04	19.04	19.04	19.04
	5	19.33	19.40	19.40	19.42	19.43	19.42	19.40	19.40	19.33	19.40	19.40	19.42	19.43	19.42	19.40
	10	19.13	19.12	19.15	19.13	19.14	19.13	19.15	19.12	19.13	19.12	19.15	19.13	19.14	19.13	19.15
	15	18.81	18.85	18.83	18.84	18.84	18.84	18.83	18.85	18.81	18.85	18.83	18.84	18.84	18.84	18.83
	20	18.38	18.42	18.43	18.41	18.40	18.41	18.43	18.42	18.38	18.42	18.43	18.41	18.40	18.41	18.43
	25	17.88	17.94	17.94	17.92	17.93	17.92	17.94	17.94	17.88	17.94	17.94	17.92	17.93	17.92	17.94
	30	17.31	17.34	17.36	17.34	17.33	17.34	17.36	17.34	17.31	17.34	17.36	17.34	17.33	17.34	17.36
	35	16.63	16.67	16.69	16.68	16.66	16.68	16.69	16.67	16.63	16.67	16.69	16.68	16.66	16.68	16.69
	40	15.90	15.95	15.96	15.97	15.95	15.97	15.96	15.95	15.90	15.95	15.96	15.97	15.95	15.97	15.96
	45	15.12	15.17	15.19	15.19	15.18	15.19	15.19	15.17	15.12	15.17	15.19	15.19	15.18	15.19	15.19
	50	14.28	14.32	14.33	14.31	14.31	14.31	14.33	14.32	14.28	14.32	14.33	14.31	14.31	14.31	14.33
	55	13.40	13.44	13.45	13.44	13.43	13.44	13.45	13.44	13.40	13.44	13.45	13.44	13.43	13.44	13.45
	60	12.45	12.51	12.52	12.50	12.50	12.50	12.52	12.51	12.45	12.51	12.52	12.50	12.50	12.52	12.51
	65	11.63	11.58	11.59	11.58	11.58	11.58	11.59	11.58	11.63	11.58	11.59	11.58	11.58	11.59	11.58
	70	10.77	10.83	10.83	10.81	10.83	10.81	10.83	10.83	10.77	10.83	10.83	10.81	10.83	10.81	10.83
	75	9.88	10.00	10.06	10.02	10.09	10.02	10.06	10.00	9.88	10.00	10.06	10.02	10.09	10.02	10.06
	80	8.70	8.94	8.98	8.95	9.11	8.95	8.98	8.94	8.70	8.94	8.98	8.95	9.11	8.95	8.98
	85	7.56	7.59	7.64	7.67	7.76	7.67	7.64	7.59	7.56	7.59	7.64	7.67	7.76	7.67	7.64
	90	6.51	6.31	6.26	6.26	6.27	6.26	6.26	6.31	6.51	6.31	6.26	6.26	6.27	6.26	6.31
	95	5.23	5.17	5.14	5.11	5.11	5.11	5.14	5.17	5.23	5.17	5.14	5.11	5.11	5.11	5.14
	100	4.17	4.19	4.24	4.24	4.21	4.24	4.24	4.19	4.17	4.19	4.24	4.24	4.21	4.24	4.24
	105	3.31	3.29	3.35	3.36	3.37	3.36	3.35	3.29	3.31	3.29	3.35	3.36	3.37	3.36	3.35
	110	2.48	2.49	2.54	2.54	2.54	2.54	2.54	2.49	2.48	2.49	2.54	2.54	2.54	2.54	2.49
	115	1.83	1.84	1.89	1.90	1.95	1.90	1.89	1.84	1.83	1.84	1.89	1.90	1.95	1.90	1.89
	120	1.36	1.35	1.39	1.45	1.43	1.45	1.39	1.35	1.36	1.35	1.39	1.45	1.43	1.45	1.39
	125	0.98	1.01	1.03	1.09	1.02	1.09	1.03	1.01	0.98	1.01	1.03	1.09	1.02	1.09	1.03
	130	0.70	0.81	0.73	0.70	0.70	0.70	0.73	0.81	0.70	0.81	0.73	0.70	0.70	0.70	0.73
	135	0.55	0.62	0.53	0.52	0.54	0.52	0.53	0.62	0.55	0.62	0.53	0.52	0.54	0.52	0.53
	140	0.46	0.43	0.41	0.43	0.42	0.43	0.41	0.43	0.46	0.43	0.41	0.43	0.42	0.43	0.41
	145	0.36	0.29	0.30	0.31	0.31	0.31	0.30	0.29	0.36	0.29	0.30	0.31	0.31	0.30	0.29
	150	0.19	0.17	0.18	0.18	0.18	0.18	0.18	0.17	0.19	0.17	0.18	0.18	0.18	0.18	0.17
	155	0.04	0.05	0.07	0.06	0.07	0.06	0.07	0.05	0.04	0.05	0.07	0.06	0.07	0.06	0.07
	160	0.00	0.00	0.00	0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.01	0.00
	165	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	170	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	175	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	180	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Average Luminance (cd/m²)
Horizontal Angle (Degrees)

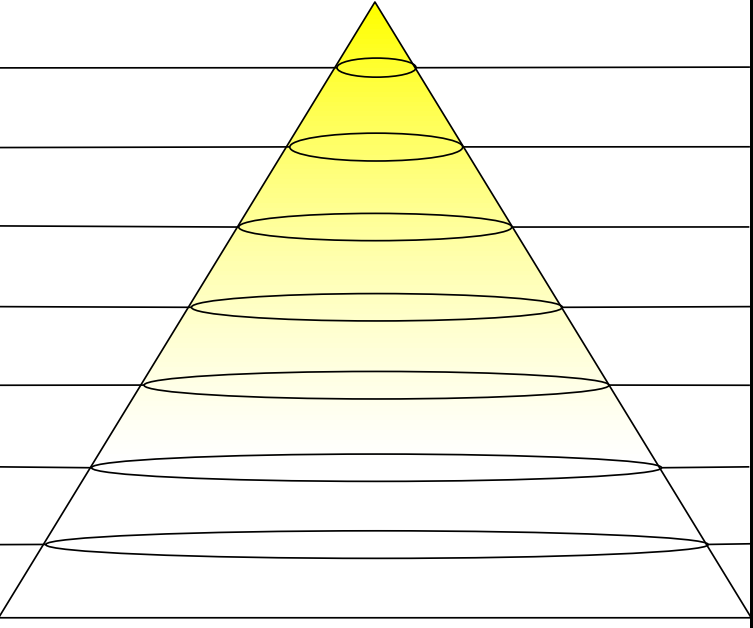
Vertical Angle (Degrees)	0	45	90
	0	6012	6012
	45	5136	5161
	55	4813	4831
	65	4490	4477
	75	4178	4255
	85	3576	3613



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	107	107	107	107	103	103	103	103	96	96	96	89	89	89	83	83	83	80
1	94	88	83	78	90	85	80	76	78	75	71	73	69	66	67	65	62	59
2	84	75	67	61	80	72	65	59	67	61	56	62	57	53	57	53	50	47
3	76	65	56	49	73	62	54	48	58	51	45	53	48	43	49	44	40	38
4	69	57	48	41	66	55	46	40	51	43	38	47	41	36	43	38	34	31
5	63	50	41	34	60	48	40	34	45	38	32	42	35	30	39	33	29	27
6	58	45	36	30	56	43	35	29	40	33	28	37	31	26	35	29	25	23
7	54	40	32	26	51	39	31	25	36	29	24	34	28	23	32	26	22	20
8	50	37	28	23	48	36	28	22	33	26	21	31	25	20	29	24	20	18
9	47	34	26	20	45	33	25	20	31	24	19	29	23	18	27	21	18	16
10	44	31	23	18	42	30	23	18	28	22	17	26	21	17	25	20	16	14

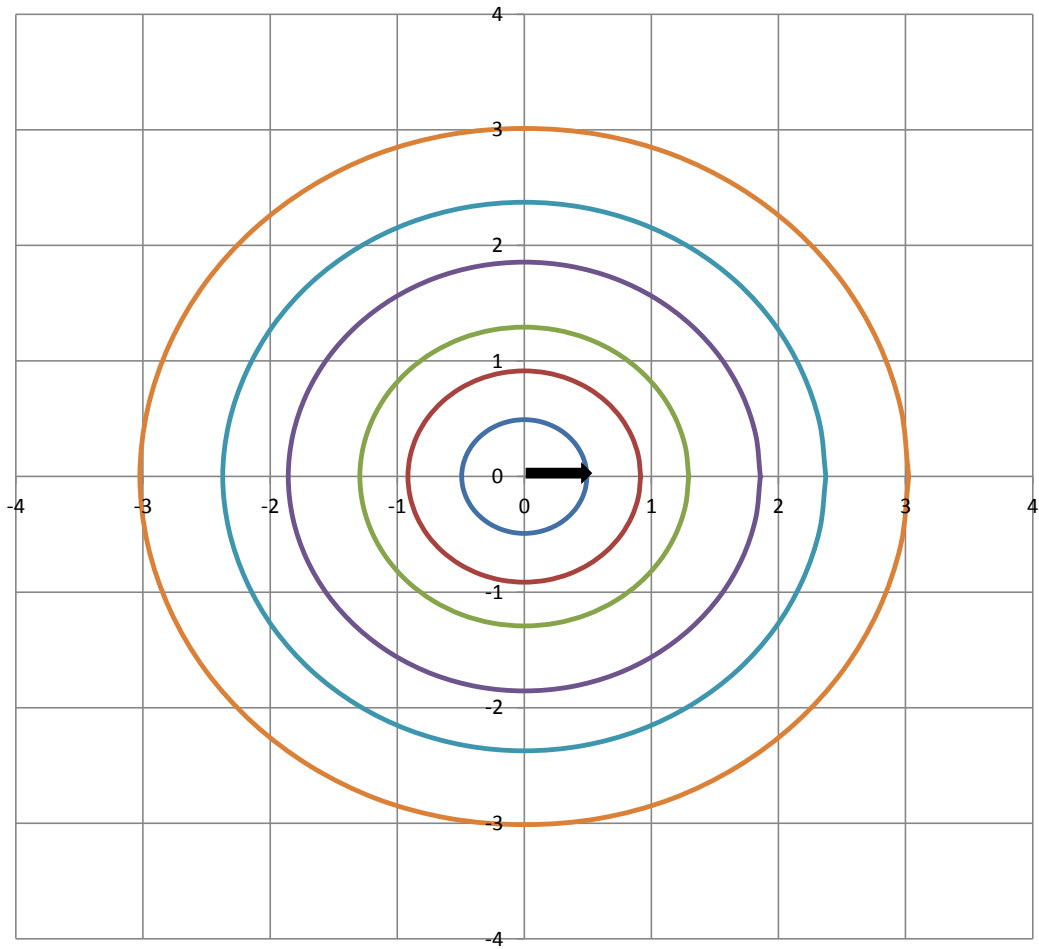
Beam and Field Information	
CIE Type:	Semi-Direct
Center Beam Intensity:	19.04 Candela
Central Cone Intensity:	19 Candela
Beam Flux:	69.1 Lumens
Beam Angle (0-180):	152.9 Degrees
Beam Angle (90-270):	155.8 Degrees
Field Angle (0-180):	228.6 Degrees
Field Angle (90-270):	230.9 Degrees

Cone of Light Tabulation			
Mounting Height (Feet)		Footcandles at Nadir	Diameter (Feet)
4.00		1.19	5.42
6.00		0.529	8.14
8.00		0.297	10.8
10.0		0.190	13.6
12.0		0.132	16.3
14.0		0.0971	19.0
16.0		0.0744	21.7



ISOFootcandle Plot

Mounting Height - 8 Feet



Grid Lines in Units of Mounting Height

— 0.2 fc — 0.1 fc — 0.05 fc — 0.02 fc — 0.01 fc — 0.005 fc