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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.2902.13

Order Number
11281216
Test Number
1267886

Test Date

2016-08-01

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 frosted lens below
Mounting: Pendant
Ballast/Driver: L.T.F. TA60WA12LED-0000

Luminaire



Luminaire Characteristics

Luminous Diameter: 3.00 in.
Luminous Height: 1.500 in.

Summary of Results

Total Luminaire Output:	135.4 Lumens
Luminaire Efficacy:	22.6 lm/w
Maximum Candela:	27 Candela

Test Conditions

Test Temperature:	24.6 °C
Voltage:	120.1 VAC
Current:	0.05230 A
Power:	5.997 W
Power Factor:	0.955
Frequency:	60 Hz
Current THD:	28.5 %

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
24.6 °C	120.1 VAC	0.05230 A	5.997 W	0.955	60 Hz	28.5 %

Summary of Results

Spacing Criteria

0-180: 1.35

90-270: 1.35

Total Lumen Output:

135.4 Lumens

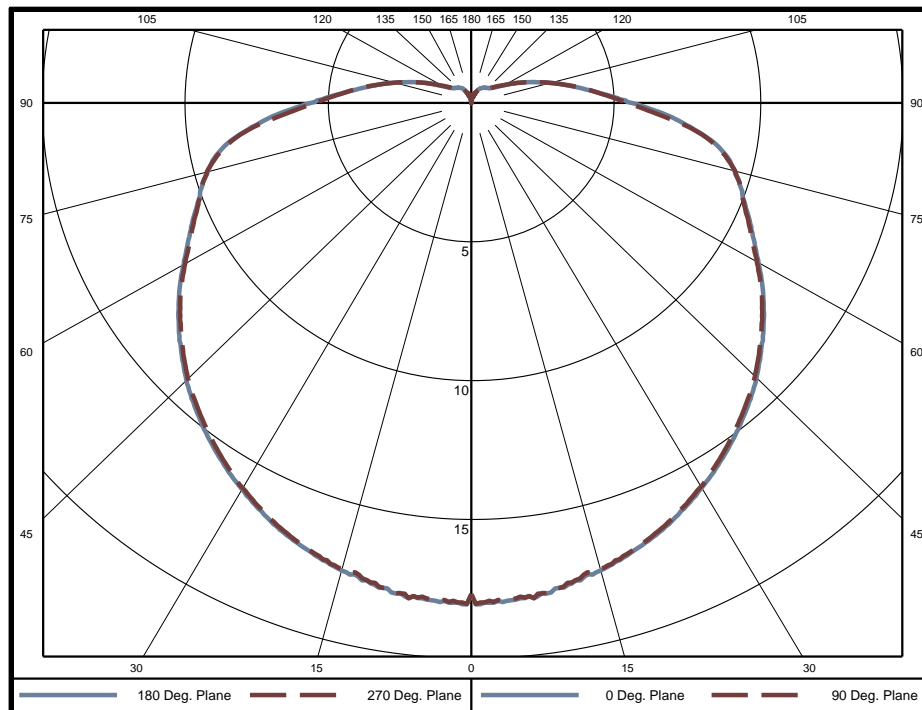
Luminaire Efficacy:

22.6 lm/w

Maximum Candela:

27 Candela

Polar Plot



Zonal Lumen Summary

Zone	Lumens	% of Luminaire	Zone	Lumens	% of Luminaire	Zone	Lumens	% of Luminaire
0-5	0.642	0.5%	60-65	8.318	6.1%	120-125	1.139	0.8%
5-10	1.909	1.4%	65-70	8.015	5.9%	125-130	0.799	0.6%
10-15	3.115	2.3%	70-75	7.637	5.6%	130-135	0.549	0.4%
15-20	4.238	3.1%	75-80	7.237	5.3%	135-140	0.369	0.3%
20-25	5.270	3.9%	80-85	6.659	4.9%	140-145	0.238	0.2%
25-30	6.181	4.6%	85-90	5.826	4.3%	145-150	0.149	0.1%
30-35	6.953	5.1%	90-95	4.961	3.7%	150-155	0.087	0.1%
35-40	7.580	5.6%	95-100	4.178	3.1%	155-160	0.045	0.0%
40-45	8.052	5.9%	100-105	3.437	2.5%	160-165	0.019	0.0%
45-50	8.350	6.2%	105-110	2.726	2.0%	165-170	0.004	0.0%
50-55	8.497	6.3%	110-115	2.104	1.6%	170-175	0	0.0%
55-60	8.494	6.3%	115-120	1.575	1.2%	175-180	0	0.0%

Zone	Lumens	% of Luminaire
0-40	36	26.5%
0-60	69	51.2%
0-90	113	83.4%
90-180	22	16.5%



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	26.70	26.70	26.70	26.70	26.70	26.70	26.70	26.70	26.70	26.70	26.70	26.70	26.70	26.70	26.70
	5	26.81	26.81	26.81	26.81	26.81	26.81	26.81	26.81	26.81	26.81	26.81	26.81	26.81	26.81	26.81
	10	26.54	26.54	26.54	26.54	26.54	26.54	26.54	26.54	26.54	26.54	26.54	26.54	26.54	26.54	26.54
	15	26.02	26.02	26.02	26.02	26.02	26.02	26.02	26.02	26.02	26.02	26.02	26.02	26.02	26.02	26.02
	20	25.48	25.48	25.48	25.48	25.48	25.48	25.48	25.48	25.48	25.48	25.48	25.48	25.48	25.48	25.48
	25	24.81	24.81	24.81	24.81	24.81	24.81	24.81	24.81	24.81	24.81	24.81	24.81	24.81	24.81	24.81
	30	24.04	24.04	24.04	24.04	24.04	24.04	24.04	24.04	24.04	24.04	24.04	24.04	24.04	24.04	24.04
	35	23.18	23.18	23.18	23.18	23.18	23.18	23.18	23.18	23.18	23.18	23.18	23.18	23.18	23.18	23.18
	40	22.26	22.26	22.26	22.26	22.26	22.26	22.26	22.26	22.26	22.26	22.26	22.26	22.26	22.26	22.26
	45	21.23	21.23	21.23	21.23	21.23	21.23	21.23	21.23	21.23	21.23	21.23	21.23	21.23	21.23	21.23
	50	20.11	20.11	20.11	20.11	20.11	20.11	20.11	20.11	20.11	20.11	20.11	20.11	20.11	20.11	20.11
	55	18.98	18.98	18.98	18.98	18.98	18.98	18.98	18.98	18.98	18.98	18.98	18.98	18.98	18.98	18.98
	60	17.76	17.76	17.76	17.76	17.76	17.76	17.76	17.76	17.76	17.76	17.76	17.76	17.76	17.76	17.76
	65	16.47	16.47	16.47	16.47	16.47	16.47	16.47	16.47	16.47	16.47	16.47	16.47	16.47	16.47	16.47
	70	15.20	15.20	15.20	15.20	15.20	15.20	15.20	15.20	15.20	15.20	15.20	15.20	15.20	15.20	15.20
	75	14.07	14.07	14.07	14.07	14.07	14.07	14.07	14.07	14.07	14.07	14.07	14.07	14.07	14.07	14.07
	80	12.95	12.95	12.95	12.95	12.95	12.95	12.95	12.95	12.95	12.95	12.95	12.95	12.95	12.95	12.95
	85	11.48	11.48	11.48	11.48	11.48	11.48	11.48	11.48	11.48	11.48	11.48	11.48	11.48	11.48	11.48
	90	9.81	9.81	9.81	9.81	9.81	9.81	9.81	9.81	9.81	9.81	9.81	9.81	9.81	9.81	9.81
	95	8.33	8.33	8.33	8.33	8.33	8.33	8.33	8.33	8.33	8.33	8.33	8.33	8.33	8.33	8.33
	100	7.05	7.05	7.05	7.05	7.05	7.05	7.05	7.05	7.05	7.05	7.05	7.05	7.05	7.05	7.05
	105	5.80	5.80	5.80	5.80	5.80	5.80	5.80	5.80	5.80	5.80	5.80	5.80	5.80	5.80	5.80
	110	4.65	4.65	4.65	4.65	4.65	4.65	4.65	4.65	4.65	4.65	4.65	4.65	4.65	4.65	4.65
	115	3.68	3.68	3.68	3.68	3.68	3.68	3.68	3.68	3.68	3.68	3.68	3.68	3.68	3.68	3.68
	120	2.83	2.83	2.83	2.83	2.83	2.83	2.83	2.83	2.83	2.83	2.83	2.83	2.83	2.83	2.83
	125	2.12	2.12	2.12	2.12	2.12	2.12	2.12	2.12	2.12	2.12	2.12	2.12	2.12	2.12	2.12
	130	1.57	1.57	1.57	1.57	1.57	1.57	1.57	1.57	1.57	1.57	1.57	1.57	1.57	1.57	1.57
	135	1.16	1.16	1.16	1.16	1.16	1.16	1.16	1.16	1.16	1.16	1.16	1.16	1.16	1.16	1.16
	140	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
	145	0.59	0.59	0.59	0.59	0.59	0.59	0.59	0.59	0.59	0.59	0.59	0.59	0.59	0.59	0.59
	150	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42
	155	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29
	160	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19
	165	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07
	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	5854	5854
	45	5454	5454
	55	5291	5291
	65	5078	5078
	75	4900	4900
	85	4632	4632



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	156	156	156	156	150	150	150	150	138	138	138	127	127	127	118	118	118	113
1	137	128	120	113	130	123	116	109	113	107	102	103	99	94	95	91	88	83
2	122	109	97	88	116	104	94	85	95	87	80	87	81	75	80	75	70	65
3	110	94	81	71	105	90	78	69	82	73	65	76	68	61	69	63	57	53
4	100	82	69	59	95	79	67	57	72	62	54	66	58	51	61	54	48	44
5	92	73	59	50	87	70	57	48	64	54	46	59	50	43	54	47	41	37
6	84	65	52	43	80	62	50	42	58	47	39	53	44	37	49	41	35	32
7	78	59	46	37	74	56	45	36	52	42	34	48	39	33	45	37	31	28
8	72	53	41	33	69	51	40	32	48	38	30	44	35	29	41	33	27	24
9	67	49	37	29	64	47	36	28	44	34	27	41	32	26	38	30	25	22
10	63	45	34	26	60	43	33	26	40	31	24	37	29	23	35	28	22	20

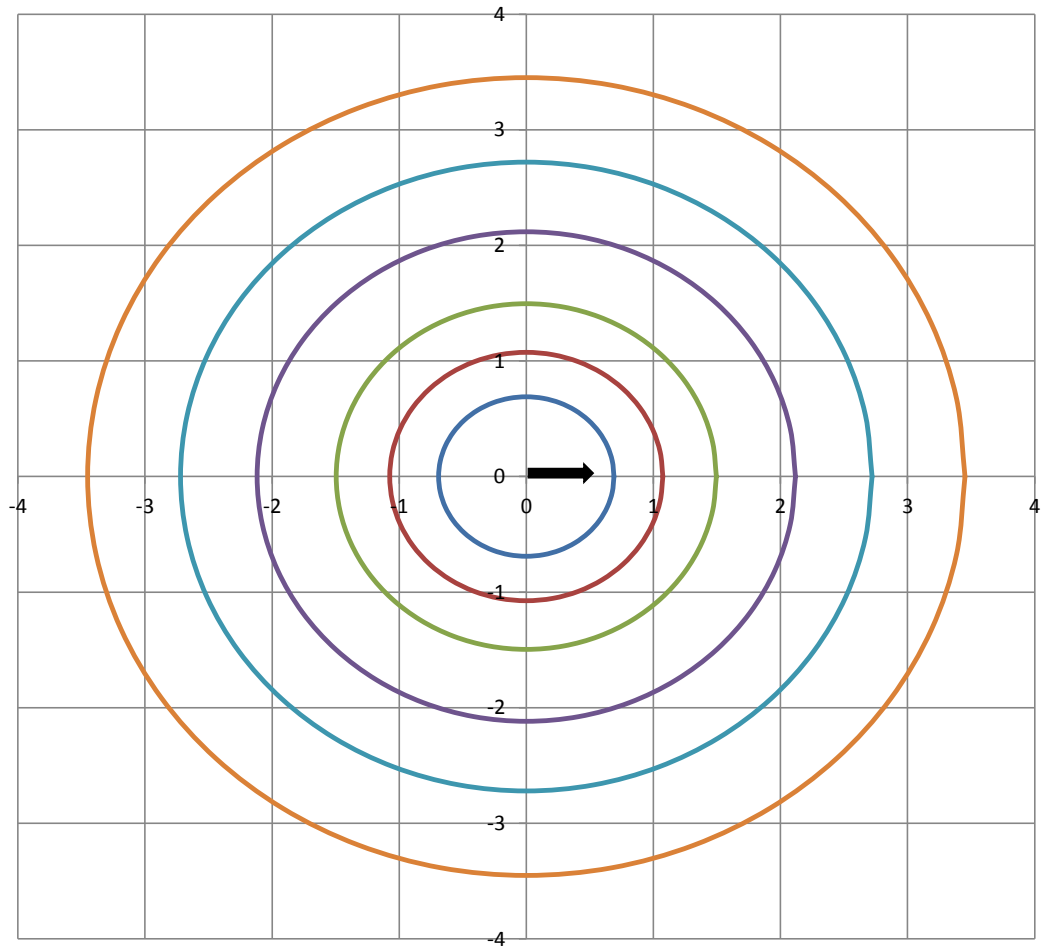
Beam and Field Information	
CIE Type:	Semi-Direct
Center Beam Intensity:	26.70 Candela
Central Cone Intensity:	27 Candela
Beam Flux:	98.2 Lumens
Beam Angle (0-180):	156.6 Degrees
Beam Angle (90-270):	156.6 Degrees
Field Angle (0-180):	242.0 Degrees
Field Angle (90-270):	242.0 Degrees

Cone of Light Tabulation			
Mounting Height (Feet)		Footcandles at Nadir	Diameter (Feet)
4.00		1.67	5.38
6.00		0.742	8.07
8.00		0.417	10.8
10.0		0.267	13.5
12.0		0.185	16.1
14.0		0.136	18.8
16.0		0.104	21.5



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