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Photometric Test Report

Relevant Standards
IES LM-79-2008
ANSI C82.77-2002
UL1598-2008

Prepared For
Scientific Lighting Products, Div Of Koller Enterprises

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United States

Catalog Number
CT4s OSRAM (Frosted DIRA Lens)

Order Number
11161897
Test Number
1216846

Test Date

2016-03-01 - 2016-03-02

Prepared By

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Approved By

Timothy Wagner, Project Handler

The results contained in this report pertain only to the tested sample.
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Laboratory results may not be representative of field performance
Ballast factors have not been applied

Testing was performed in a 3-meter integrating sphere using the 4π geometry method.
Absorption correction was employed for Sphere measurement



Luminaire Description: White plastic housing, frosted lens enclosure
Lamp: 360 white LEDs
Mounting: Pendant
Ballast/Driver: Two OSRAM OPTOTRONIC OT50W/CS1400C/UNV/SD/L

Luminaire



Luminaire Characteristics

Luminous Length: 26.00 in.
Luminous Width: 14.00 in.
Luminous Height: 3.00 in.

Summary of Results

Integrating Sphere

Luminous Flux: 11220 Lumens
Efficacy: 107.4 lm/w
CCT: 4036 K
CRI (Ra): 83.5

Distribution

Total Luminaire Output: 10990 Lumens
Luminaire Efficacy: 105.2 lm/w
Maximum Candela: 3729 Candela

Electrical Data at 277 VAC

Test Temperature: 25.0 °C
Voltage: 277.0 VAC
Current: 0.3817 A
Power: 102.3 W
Power Factor: 0.968
Frequency: 60 Hz
Current THD: 9.15 %

In-Situ

LED Temperature: 72.0 °C
Driver Temperature: 70.0 °C
Measured LED Current: 0.08500 A

Temperature is offset to an ambient temperature of 25°C as described in UL1598-2008.

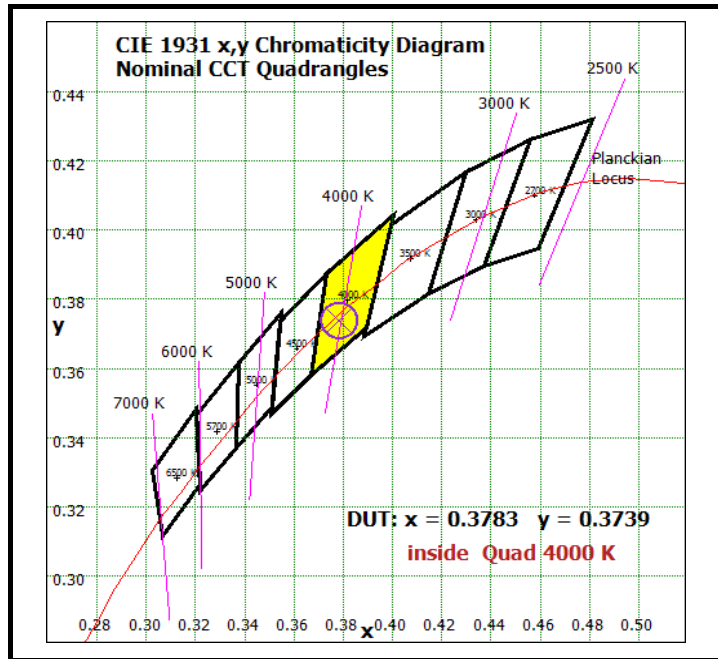


Color Quality - Integrating Sphere

Integrating Sphere Test Conditions

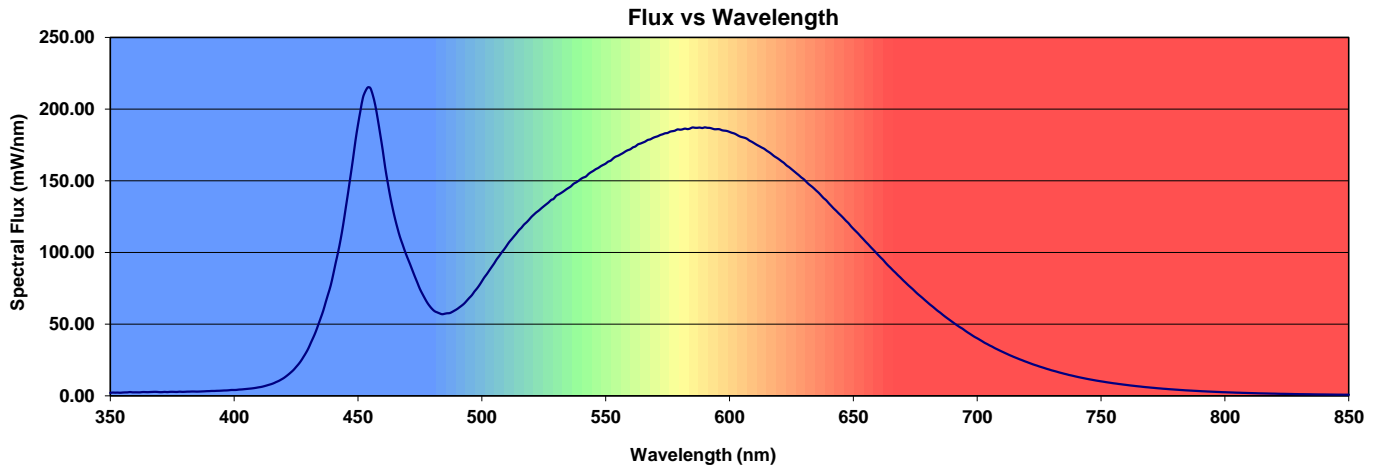
Temperature	Voltage	Current	Power	Power Factor	Frequency	Current THD
24.8 °C	120.0 VAC	0.8722 A	104.5 W	0.998	60 Hz	3.83 %

Summary of Results	
Total Output:	11220 Lumens
Efficacy:	107.4 lm/w
CCT:	4036 K
CRI (Ra):	83.5
CRI (R9):	23.0
Chromaticity (x):	0.3783
Chromaticity (y):	0.3739
Chromaticity (u):	0.2248
Chromaticity (v):	0.3333
Chromaticity (u'):	0.2248
Chromaticity (v'):	0.5000
Duv:	-0.0014



Color Rendering Index Detail

Ra (CRI)	R1	R2	R3	R4	R5	R6	R7	R8	R9	R10	R11	R12	R13	R14
83.5	82.0	89.2	93.0	81.2	81.2	83.4	88.1	70.1	23.0	72.8	78.2	58.8	83.7	96.0





Distribution - Goniophotometer

Distribution Test Conditions

Temperature	Voltage	Current	Power	Power Factor	Frequency	Current THD
24.9 °C	120.0 VAC	0.8723 A	104.5 W	0.998	60 Hz	3.68 %

Summary of Results

Spacing Criteria

0-180: 1.26

90-270: 1.26

Total Lumen Output:

10990 Lumens

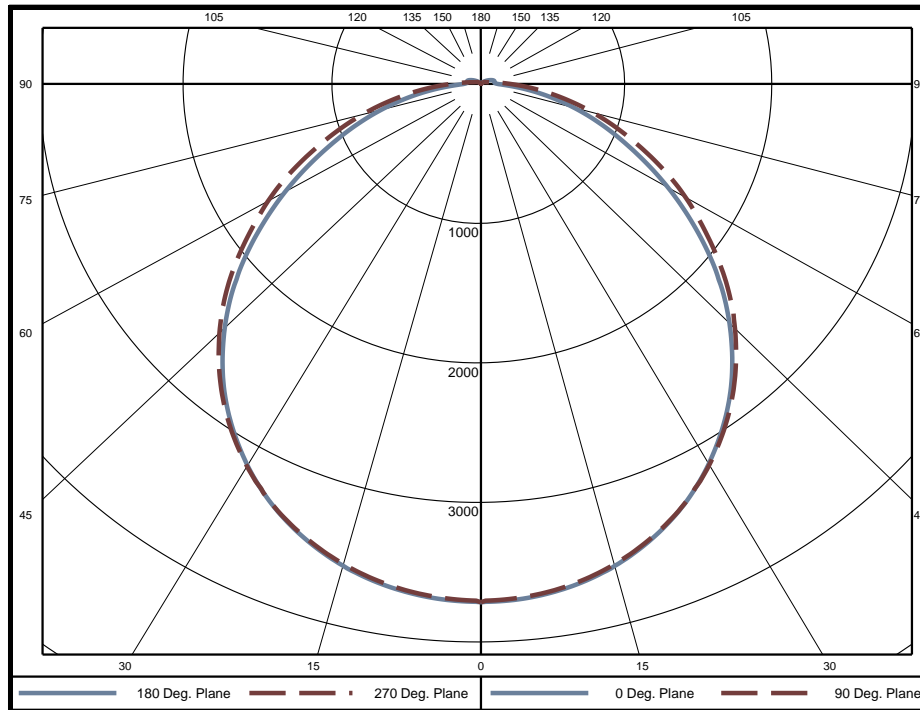
Luminaire Efficacy:

105.2 lm/w

Maximum Candela:

3729 Candela

Polar Plot



Zonal Lumen Summary

Zone	Lumens	% of Luminaire	Zone	Lumens	% of Luminaire	Zone	Lumens	% of Luminaire
0-5	88.7	0.8%	60-65	692.2	6.3%	120-125	12.9	0.1%
5-10	263.2	2.4%	65-70	574.5	5.2%	125-130	8.5	0.1%
10-15	429.1	3.9%	70-75	454.1	4.1%	130-135	5.3	0.0%
15-20	580.8	5.3%	75-80	334.8	3.0%	135-140	3.2	0.0%
20-25	713.4	6.5%	80-85	222.2	2.0%	140-145	2.0	0.0%
25-30	821.4	7.5%	85-90	129.9	1.2%	145-150	1.4	0.0%
30-35	900.4	8.2%	90-95	73.0	0.7%	150-155	1.1	0.0%
35-40	947.1	8.6%	95-100	46.4	0.4%	155-160	0.9	0.0%
40-45	959.6	8.7%	100-105	35.0	0.3%	160-165	0.8	0.0%
45-50	938.0	8.5%	105-110	28.8	0.3%	165-170	0.6	0.0%
50-55	882.0	8.0%	110-115	23.4	0.2%	170-175	0.4	0.0%
55-60	797.1	7.3%	115-120	18.0	0.2%	175-180	0.1	0.0%

Zone	Lumens	% of Luminaire
0-40	4744	43.2%
0-60	8321	75.7%
0-90	10729	97.6%
90-180	262	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	3716	3716	3716	3716	3716	3716	3716	3716	3716	3716	3716	3716	3716	3716	3716
	5	3699	3715	3702	3693	3688	3693	3702	3715	3699	3715	3702	3693	3688	3693	3702
	10	3654	3670	3656	3647	3642	3647	3656	3670	3654	3670	3656	3647	3642	3647	3656
	15	3577	3592	3577	3570	3565	3570	3577	3592	3577	3592	3577	3570	3565	3570	3577
	20	3466	3481	3471	3464	3458	3464	3471	3481	3466	3481	3471	3464	3458	3464	3471
	25	3325	3339	3334	3328	3323	3328	3334	3339	3325	3339	3334	3328	3323	3328	3334
	30	3147	3161	3162	3161	3154	3161	3162	3161	3147	3161	3162	3161	3154	3161	3162
	35	2938	2954	2957	2962	2957	2962	2957	2954	2938	2954	2957	2962	2957	2962	2957
	40	2699	2716	2720	2732	2732	2732	2720	2716	2699	2716	2720	2732	2732	2732	2720
	45	2429	2451	2460	2481	2481	2481	2460	2451	2429	2451	2460	2481	2481	2481	2460
	50	2133	2163	2178	2205	2210	2205	2178	2163	2133	2163	2178	2205	2210	2205	2178
	55	1815	1853	1882	1911	1916	1911	1882	1853	1815	1853	1882	1911	1916	1911	1882
	60	1498	1539	1575	1617	1635	1617	1575	1539	1498	1539	1575	1617	1635	1617	1575
	65	1192	1231	1277	1329	1344	1329	1277	1231	1192	1231	1277	1329	1344	1329	1277
	70	921	951	1003	1050	1063	1050	1003	951	921	951	1003	1050	1063	1050	1003
	75	672	696	748	793	807	793	748	696	672	696	748	793	807	793	748
	80	440	467	519	561	567	561	519	467	440	467	519	561	567	561	519
	85	236	273	327	356	358	356	327	273	236	273	327	356	358	356	327
	90	116	147	187	204	201	204	187	147	116	147	187	204	201	204	187
	95	94	89	104	114	113	114	104	89	94	89	104	114	113	114	104
	100	95	75	66	69	68	69	66	75	95	75	66	69	68	69	66
	105	92	70	51	48	47	48	51	70	92	70	51	48	47	48	51
	110	80	62	43	39	38	39	43	62	80	62	43	39	38	39	43
	115	64	50	36	32	32	32	36	50	64	50	36	32	32	32	36
	120	48	39	29	25	27	25	29	39	48	39	29	25	27	25	29
	125	35	28	20	18	21	18	20	28	35	28	20	18	21	18	20
	130	24	19	12	13	15	13	12	19	24	19	12	13	15	13	12
	135	16	13	8	8	10	8	8	13	16	13	8	8	10	8	8
	140	12	9	5	5	6	5	5	9	12	9	5	5	6	5	5
	145	8	6	4	4	4	4	4	6	8	6	4	4	4	4	4
	150	5	5	4	4	4	4	4	5	5	5	4	4	4	4	4
	155	5	4	4	4	4	4	4	5	4	4	4	4	4	4	4
	160	5	5	4	4	4	4	4	5	5	5	4	4	4	4	4
	165	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
	170	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
	175	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
	180	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5

Average Luminance (cd/m²)

Horizontal Angle (Degrees)

Vertical Angle (Degrees)	0	45	90
	0	15830	15830
	45	13110	12310
	55	11570	10890
	65	9628	9277
	75	7733	7378
	85	4974	5072



Utilization of Lumens - Zonal Cavity Method

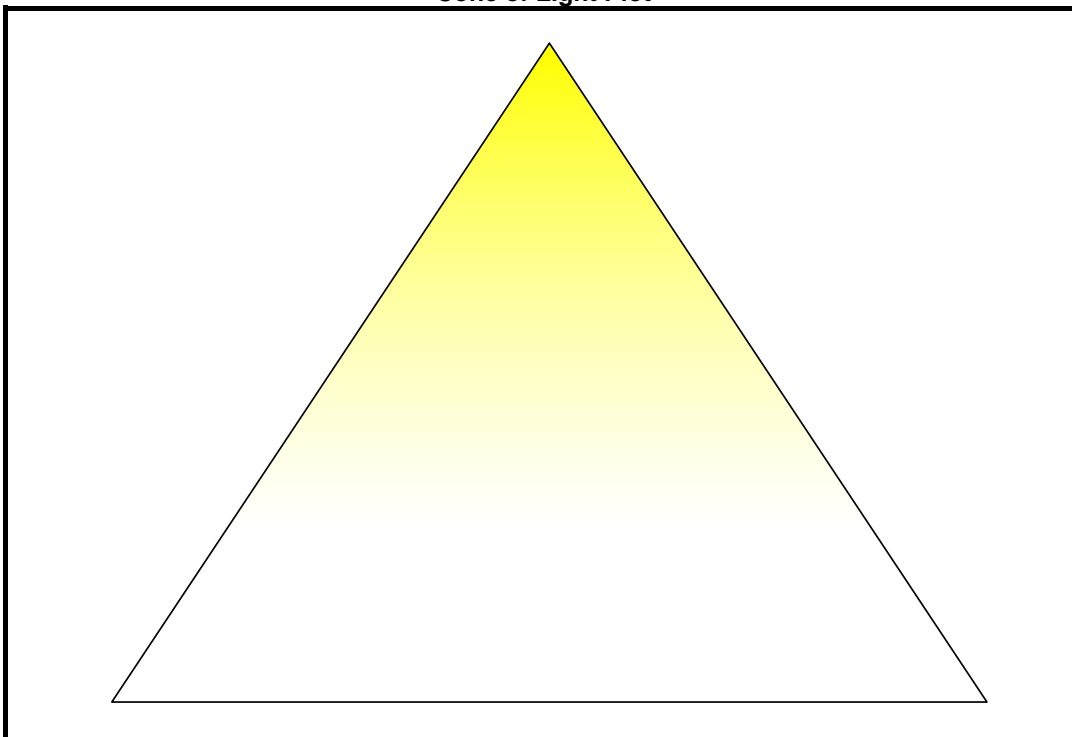
Effective Floor Cavity Reflectance 20%

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	13021	13021	13021	13021	12688	12688	12688	12688	12066	12066	12066	11497	11497	11497	10974	10974	10974	10728
1	11830	11279	10785	10341	11500	11002	10553	10147	10484	10115	9777	10008	9708	9430	9569	9329	9104	8852
2	10744	9812	9042	8393	10427	9581	8873	8272	9145	8552	8038	8744	8250	7815	8373	7966	7602	7346
3	9789	8609	7696	6968	9491	8414	7569	6888	8047	7325	6731	7707	7094	6580	7392	6876	6434	6179
4	8960	7624	6646	5899	8685	7460	6548	5843	7149	6359	5733	6860	6178	5626	6592	6006	5522	5272
5	8239	6811	5813	5076	7987	6671	5735	5035	6407	5585	4955	6161	5442	4877	5931	5304	4800	4557
6	7607	6131	5140	4429	7378	6012	5077	4398	5786	4956	4337	5575	4840	4278	5377	4728	4220	3986
7	7053	5557	4588	3909	6845	5455	4537	3885	5261	4437	3838	5079	4341	3791	4908	4249	3746	3521
8	6564	5070	4130	3484	6376	4982	4088	3465	4814	4005	3428	4656	3925	3391	4508	3848	3354	3140
9	6132	4652	3745	3133	5962	4576	3710	3118	4430	3640	3087	4292	3573	3057	4163	3508	3027	2823
10	5749	4291	3419	2839	5594	4225	3389	2826	4097	3330	2801	3977	3273	2776	3863	3217	2751	2556

Cone of Light Tabulation

Mounting Height (Feet)	Footcandles at Nadir	Diameter (Feet)
4.00	232	5.05
6.00	103	7.57
8.00	58.1	10.1
10.0	37.2	12.6
12.0	25.8	15.1
14.0	19.0	17.7
16.0	14.5	20.2

Cone of Light Plot





In-Situ Test

In-Situ Test Conditions

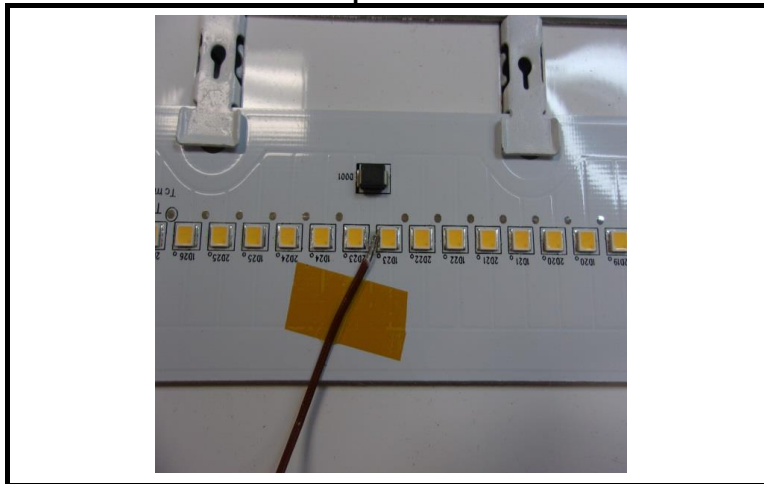
Temperature	Voltage	Current	Power	Power Factor	Frequency	Current THD
23.9 °C	120.0 VAC	N/A	N/A	N/A	60 Hz	N/A

Summary of Results

LED Temperature: 72.0 °C
Driver Temperature: 70.0 °C
Measured LED Current: 0.08500 A

Temperatures are offset to an ambient temperature of 25°C as described in UL1598-2008

LED Temperature Location



Driver Temperature Location

