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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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**Catalog Number**  
**CT4s FORTIMO (Frosted DIRA Lens)**

Order Number  
11161897  
Test Number  
1216835

**Test Date**

2016-03-01 - 2016-03-03

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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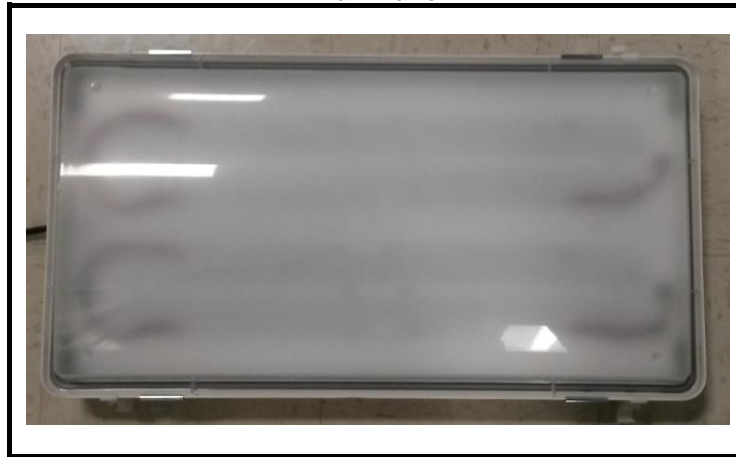
Laboratory results may not be representative of field performance  
Ballast factors have not been applied

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



**Luminaire Description:** White plastic housing, frosted lens enclosure  
**Lamp:** 176 white LEDs  
**Mounting:** Pendant  
**Ballast/Driver:** Two Philips Xitanium XI054C150V054DNT1

**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: 12400 Lumens  
Efficacy: 117.1 lm/w  
CCT: 3984 K  
CRI (Ra): 83.5

**Distribution**

Total Luminaire Output: 12150 Lumens  
Luminaire Efficacy: 114.7 lm/w  
Maximum Candela: 4199 Candela

**Electrical Data at 277 VAC**

Test Temperature: 25.2 °C  
Voltage: 277.0 VAC  
Current: 0.3976 A  
Power: 103.8 W  
Power Factor: 0.942  
Frequency: 60 Hz  
Current THD: 19.6 %

**In-Situ**

LED Temperature: 70.5 °C  
Driver Temperature: 78.0 °C  
Measured LED Current: 0.1851 A

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

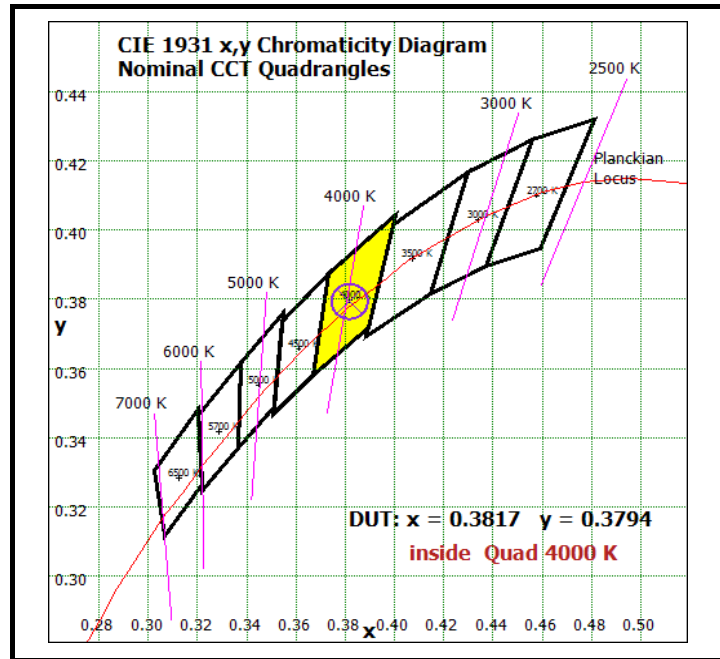


## Color Quality - Integrating Sphere

### Integrating Sphere Test Conditions

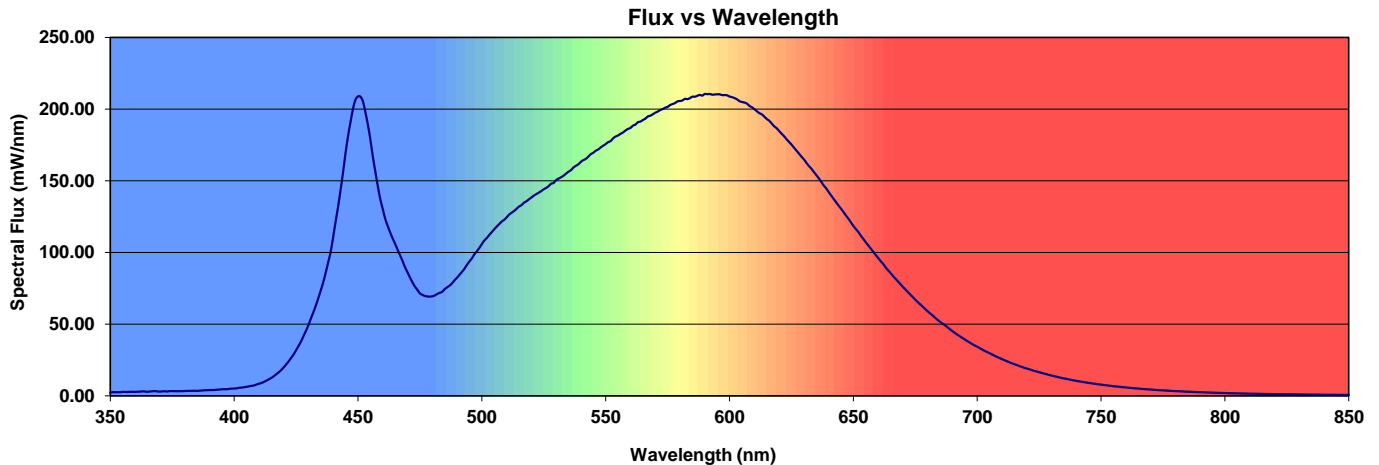
Temperature	Voltage	Current	Power	Power Factor	Frequency	Current THD
25.2 °C	120.0 VAC	0.8918 A	105.9 W	0.990	60 Hz	13.0 %

Summary of Results	
Total Output:	12400 Lumens
Efficacy:	117.1 lm/w
CCT:	3984 K
CRI (Ra):	83.5
CRI (R9):	14.3
Chromaticity (x):	0.3817
Chromaticity (y):	0.3794
Chromaticity (u):	0.2248
Chromaticity (v):	0.3353
Chromaticity (u'):	0.2248
Chromaticity (v'):	0.5029
Duv:	0.0009



### Color Rendering Index Detail

Ra (CRI)	R1	R2	R3	R4	R5	R6	R7	R8	R9	R10	R11	R12	R13	R14
83.5	81.5	89.2	94.7	82.2	81.6	84.9	87.1	66.8	14.3	74.1	80.5	65.5	83.2	97.1





## Distribution - Goniophotometer

### Distribution Test Conditions

Temperature	Voltage	Current	Power	Power Factor	Frequency	Current THD
25.1 °C	120.0 VAC	0.8920 A	106.0 W	0.990	60 Hz	13.0 %

### Summary of Results

#### Spacing Criteria

0-180: 1.25  
90-270: 1.25

#### Total Lumen Output:

12150 Lumens

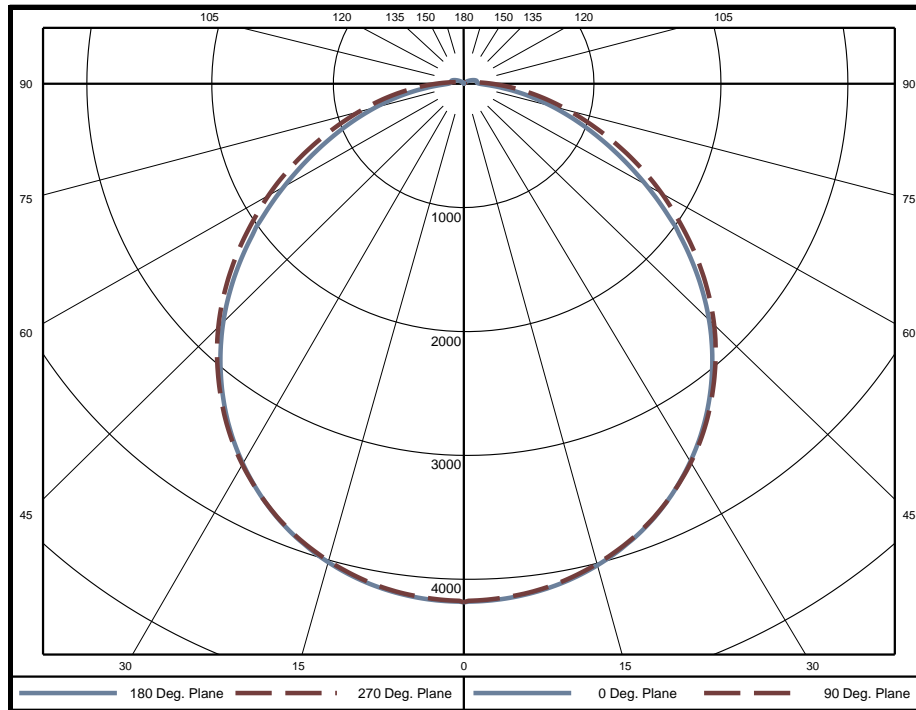
#### Luminaire Efficacy:

114.7 lm/w

#### Maximum Candela:

4199 Candela

### Polar Plot



### Zonal Lumen Summary

Zone	Lumens	% of Luminaire	Zone	Lumens	% of Luminaire	Zone	Lumens	% of Luminaire
0-5	100	0.8%	60-65	755	6.2%	120-125	14	0.1%
5-10	296	2.4%	65-70	622	5.1%	125-130	9	0.1%
10-15	483	4.0%	70-75	487	4.0%	130-135	6	0.0%
15-20	653	5.4%	75-80	357	2.9%	135-140	3	0.0%
20-25	801	6.6%	80-85	237	2.0%	140-145	2	0.0%
25-30	921	7.6%	85-90	140	1.2%	145-150	2	0.0%
30-35	1007	8.3%	90-95	79	0.7%	150-155	1	0.0%
35-40	1057	8.7%	95-100	50	0.4%	155-160	1	0.0%
40-45	1068	8.8%	100-105	38	0.3%	160-165	1	0.0%
45-50	1040	8.6%	105-110	31	0.3%	165-170	1	0.0%
50-55	974	8.0%	110-115	25	0.2%	170-175	0	0.0%
55-60	875	7.2%	115-120	19	0.2%	175-180	0	0.0%

Zone	Lumens	% of Luminaire
0-40	5318	43.8%
0-60	9275	76.3%
0-90	11873	97.7%
90-180	282	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	4185	4185	4185	4185	4185	4185	4185	4185	4185	4185	4185	4185	4185	4185	4185
	5	4164	4183	4167	4160	4154	4160	4167	4183	4164	4183	4167	4160	4154	4160	4183
	10	4112	4130	4114	4107	4101	4107	4114	4130	4112	4130	4114	4107	4101	4107	4130
	15	4022	4039	4023	4016	4010	4016	4023	4039	4022	4039	4023	4016	4010	4016	4023
	20	3896	3912	3899	3892	3887	3892	3899	3912	3896	3912	3899	3892	3887	3892	3899
	25	3730	3747	3740	3733	3726	3733	3740	3747	3730	3747	3740	3733	3726	3733	3740
	30	3525	3543	3541	3538	3531	3538	3541	3543	3525	3543	3541	3538	3531	3538	3543
	35	3286	3303	3305	3306	3301	3306	3305	3303	3286	3303	3305	3306	3301	3306	3305
	40	3009	3029	3028	3040	3038	3040	3028	3029	3009	3029	3028	3040	3038	3040	3029
	45	2703	2729	2732	2749	2754	2749	2732	2729	2703	2729	2732	2749	2754	2749	2732
	50	2364	2395	2411	2434	2439	2434	2411	2395	2364	2395	2411	2434	2439	2434	2411
	55	2017	2046	2070	2098	2107	2098	2070	2046	2017	2046	2070	2098	2107	2098	2070
	60	1645	1687	1726	1762	1782	1762	1726	1687	1645	1687	1726	1762	1782	1762	1726
	65	1302	1344	1388	1438	1454	1438	1388	1344	1302	1344	1388	1438	1454	1438	1388
	70	994	1030	1083	1124	1138	1124	1083	1030	994	1030	1083	1124	1138	1124	1083
	75	718	748	801	843	853	843	801	748	718	748	801	843	853	843	801
	80	469	497	554	596	605	596	554	497	469	497	554	596	605	596	554
	85	250	291	351	384	387	384	351	291	250	291	351	384	387	384	351
	90	126	158	200	221	222	221	200	158	126	158	200	221	222	221	200
	95	103	96	112	124	123	124	112	96	103	96	112	124	123	124	112
	100	103	81	71	76	75	76	71	81	103	81	71	76	75	76	71
	105	100	75	55	53	53	53	55	75	100	75	55	53	53	53	55
	110	86	67	47	42	42	42	47	67	86	67	47	42	42	42	47
	115	68	54	39	34	36	34	39	54	68	54	39	34	36	34	39
	120	52	42	31	27	29	27	31	42	52	42	31	27	29	27	31
	125	38	30	21	19	22	19	21	30	38	30	21	19	22	19	21
	130	26	20	13	13	16	13	13	20	26	20	13	13	16	13	13
	135	18	14	8	8	11	8	8	14	18	14	8	8	11	8	8
	140	13	10	5	4	6	4	5	10	13	10	5	4	6	4	5
	145	9	7	4	4	4	4	4	7	9	7	4	4	4	4	7
	150	6	5	5	5	5	5	5	6	5	5	5	5	5	5	5
	155	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
	160	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
	165	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
	170	6	6	6	6	5	6	6	6	6	6	6	5	6	6	6
	175	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
	180	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6

**Average Luminance (cd/m<sup>2</sup>)**  
Horizontal Angle (Degrees)

Vertical Angle (Degrees)	0	45	90
	0	17820	17820
	45	14590	13660
	55	12850	11980
	65	10520	10040
	75	8260	7801
	85	5270	4674



### Utilization of Lumens - Zonal Cavity Method

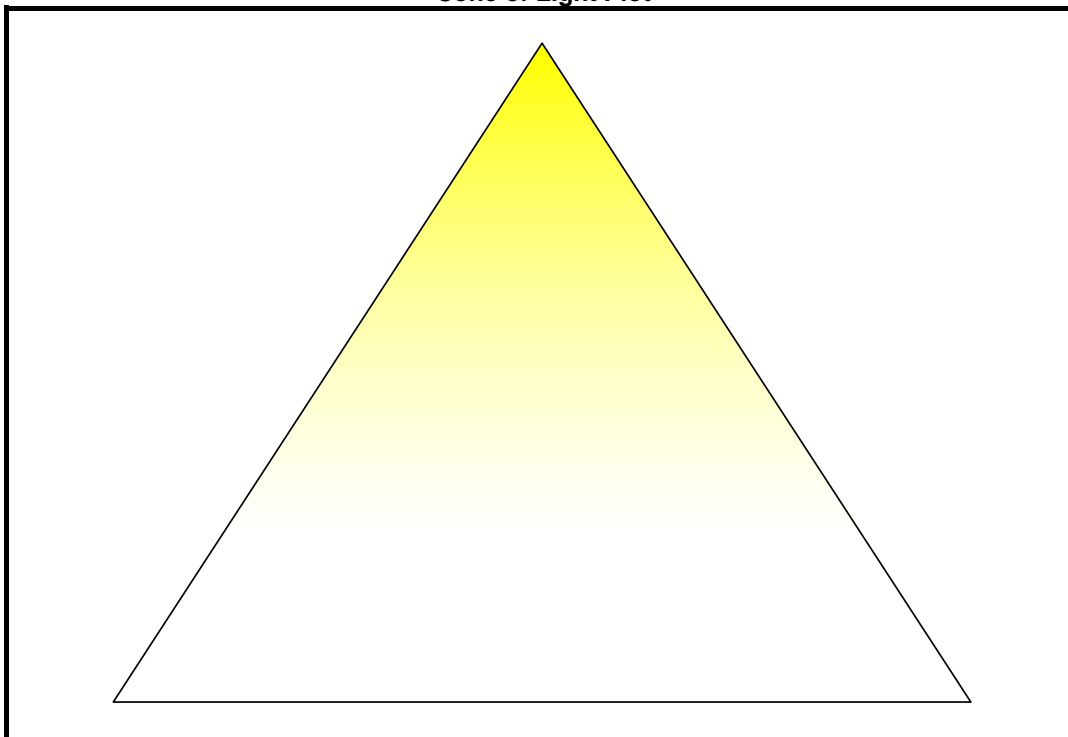
Effective Floor Cavity Reflectance 20%

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	14402	14402	14402	14402	14034	14034	14034	14034	13347	13347	13347	12719	12719	12719	12142	12142	12142	11871
1	13098	12495	11954	11467	12735	12189	11698	11252	11618	11214	10844	11093	10765	10460	10609	10346	10100	9823
2	11905	10883	10037	9326	11556	10627	9851	9192	10148	9496	8933	9705	9163	8687	9296	8850	8451	8170
3	10853	9557	8554	7754	10525	9342	8413	7665	8937	8145	7492	8563	7890	7325	8216	7649	7164	6883
4	9938	8470	7394	6573	9635	8288	7286	6511	7946	7077	6389	7628	6878	6271	7332	6689	6156	5881
5	9141	7570	6472	5661	8864	7416	6386	5616	7125	6221	5528	6854	6063	5442	6601	5911	5357	5090
6	8443	6817	5726	4943	8190	6686	5657	4909	6437	5524	4842	6205	5395	4777	5988	5272	4713	4455
7	7829	6182	5114	4366	7600	6069	5058	4339	5855	4948	4288	5655	4843	4237	5467	4741	4186	3939
8	7288	5641	4605	3894	7081	5544	4559	3873	5359	4468	3832	5186	4380	3791	5023	4295	3751	3515
9	6809	5178	4178	3503	6622	5093	4139	3486	4933	4063	3453	4781	3989	3420	4639	3917	3387	3162
10	6384	4777	3815	3175	6214	4704	3782	3161	4563	3717	3134	4431	3654	3106	4305	3593	3079	2864

### Cone of Light Tabulation

Mounting Height (Feet)	Footcandles at Nadir	Diameter (Feet)
4.00	262	5.02
6.00	116	7.53
8.00	65.4	10.0
10.0	41.8	12.5
12.0	29.1	15.1
14.0	21.4	17.6
16.0	16.3	20.1

### Cone of Light Plot





## In-Situ Test

### In-Situ Test Conditions

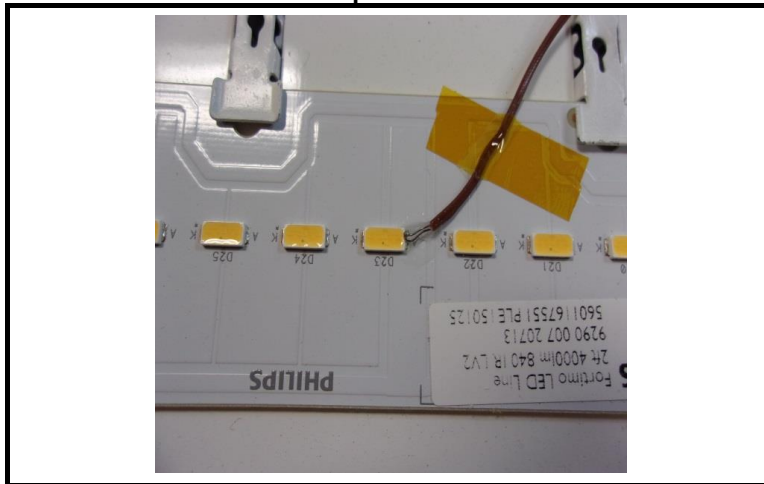
Temperature	Voltage	Current	Power	Power Factor	Frequency	Current THD
23.7 °C	120.0 VAC	N/A	N/A	N/A	60 Hz	N/A

### Summary of Results

LED Temperature: 70.5 °C  
Driver Temperature: 78.0 °C  
Measured LED Current: 0.1851 A

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

### LED Temperature Location



### Driver Temperature Location

