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## Photometric Test Report

Relevant Standards  
IES LM-79-2008, ANSI C82.77-2002, UL 1598-2008  
CIE 13.3-1995, CIE 15-2004, ANSI C78.377-2015  
IES TM-30-2015

Prepared For  
**H E Williams Inc**  
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United States

Catalog Number  
**SRKA-X4-L31/830-X-XXX-UNV (Driver 1)**  
Order Number  
12118431  
Test Number  
12118431.06

Test Date

2018-01-08 - 2018-01-11

Prepared By

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Approved By

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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 formed steel housing, clear plastic optic. Tested in Columbia CS Bi-Pin 2L reference housing.  
**Lamp:** 56 white LEDs  
**Mounting:** Surface – Ceiling  
**Ballast/Driver:** One Philips CI024C045V052CNN1 driver

#### Luminaire



#### Luminaire Characteristics

Luminous Length: 48.00 in.  
Luminous Width: 4.500 in.  
Luminous Height: 0.50 in.

#### Summary of Results

##### Integrating Sphere

Luminous Flux: 2823 Lumens  
Efficacy: 134.2 lm/w  
CCT: 3077 K  
CRI (Ra): 83.3

##### Distribution

Total Luminaire Output: 2805 Lumens  
Luminaire Efficacy: 132.9 lm/w  
Maximum Candela: 2661 Candela

##### Electrical Data at 277 VAC

Test Temperature: 25.0 °C  
Voltage: 277.0 VAC  
Current: 0.08063 A  
Power: 21.24 W  
Power Factor: 0.957  
Frequency: 60 Hz  
Current THD: 9.24 %

##### In-Situ

LED Temperature: 35.1 °C  
Driver Temperature: 42.7 °C  
Measured LED Current: 0.1088 A

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



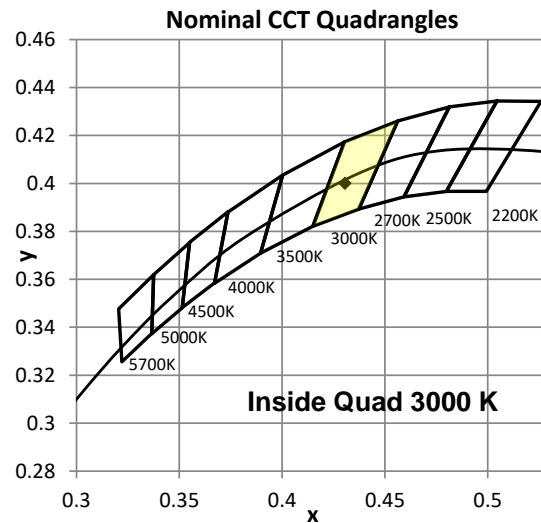
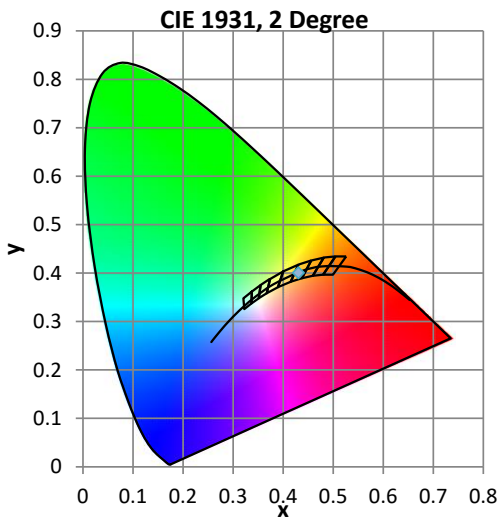
## Color Quality - Integrating Sphere

### Integrating Sphere Test Conditions

Temperature	Voltage	Current	Power	Power Factor	Frequency	Current THD
24.8 °C	119.9 VAC	0.1763 A	21.03 W	0.995	60 Hz	10.1 %

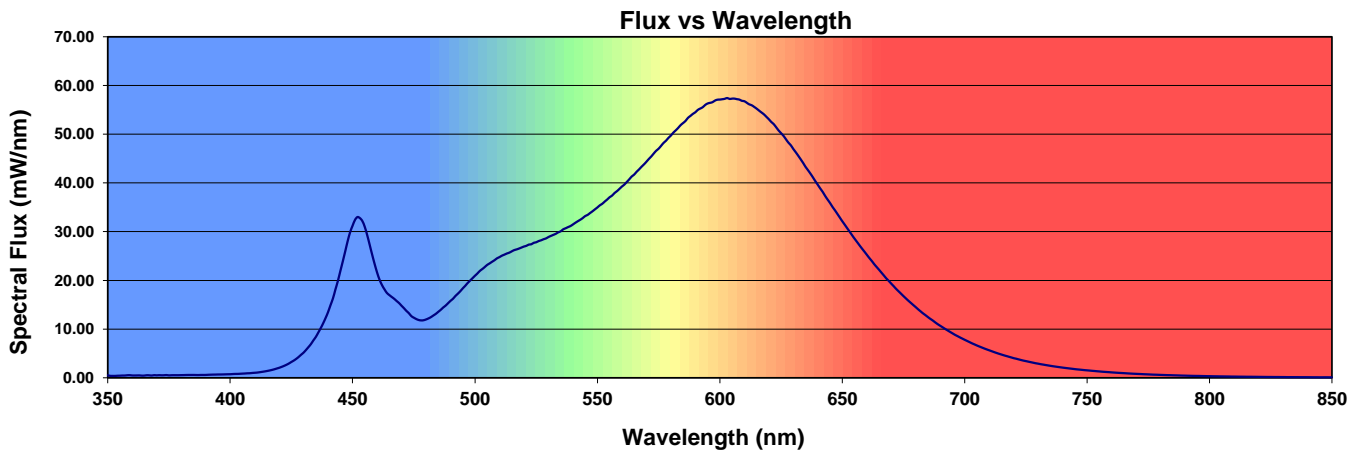
### Summary of Results

Total Output:	2823 Lumens	Chromaticity (x):	0.4305
Efficacy:	134.2 lm/w	Chromaticity (y):	0.4001
CCT:	3077 K	Chromaticity (u'):	0.2481
CRI (Ra):	83.3	Chromaticity (v'):	0.5188
CRI (R9):	7.7	TM-30 Rf:	84
Peak Wavelength:	603.4 nm	TM-30 Rg:	95.9
Dominant Wavelength:	582.8 nm	Duv:	-0.0007
S/P Ratio:	1.4		



### Color Rendering Index Detail

Ra (CRI)	R1	R2	R3	R4	R5	R6	R7	R8	R9	R10	R11	R12	R13	R14	R15
83.3	82.1	92.3	95.3	81.5	82.8	91.1	82.3	59.1	7.7	82.8	81.6	75.4	84.7	98.0	74.5





## Distribution - Goniophotometer

### Distribution Test Conditions

Temperature	Voltage	Current	Power	Power Factor	Frequency	Current THD
25.0 °C	120.0 VAC	0.1767 A	21.10 W	0.995	60 Hz	9.83 %

### Summary of Results

#### Spacing Criteria

0-180: 1.45

90-270: 0.60

Total Lumen Output:

2805 Lumens

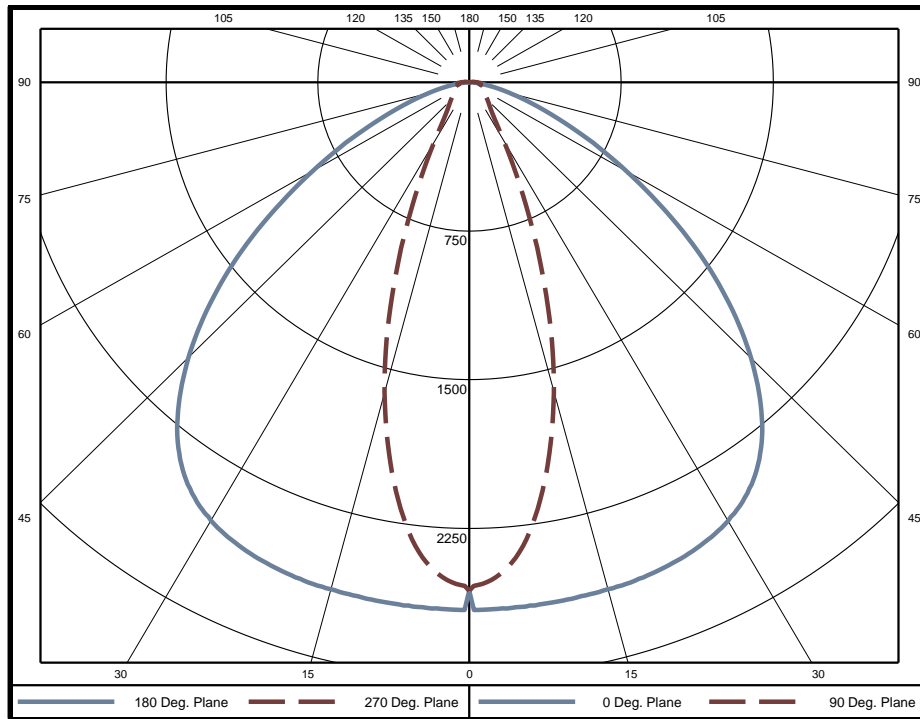
Luminaire Efficacy:

132.9 lm/w

Maximum Candela:

2661 Candela

### Polar Plot



### Zonal Lumen Summary

Zone	Lumens	% of Luminaire	Zone	Lumens	% of Luminaire	Zone	Lumens	% of Luminaire
0-5	60.6	2.2%	60-65	76.4	2.7%	120-125	0	0.0%
5-10	173.2	6.2%	65-70	56.6	2.0%	125-130	0	0.0%
10-15	259.9	9.3%	70-75	43.9	1.6%	130-135	0	0.0%
15-20	310.3	11.1%	75-80	36.0	1.3%	135-140	0	0.0%
20-25	320.0	11.4%	80-85	28.7	1.0%	140-145	0	0.0%
25-30	299.6	10.7%	85-90	23.0	0.8%	145-150	0	0.0%
30-35	265.7	9.5%	90-95	11.2	0.4%	150-155	0	0.0%
35-40	230.1	8.2%	95-100	4.9	0.2%	155-160	0	0.0%
40-45	196.6	7.0%	100-105	0.2	0.0%	160-165	0	0.0%
45-50	166.3	5.9%	105-110	0	0.0%	165-170	0	0.0%
50-55	136.5	4.9%	110-115	0	0.0%	170-175	0	0.0%
55-60	105.7	3.8%	115-120	0	0.0%	175-180	0	0.0%

Zone	Lumens	% of Luminaire
0-40	1919	68.4%
0-60	2525	90.0%
0-90	2789	99.4%
90-180	16	0.6%



### 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	2564	2564	2564	2564	2564	2564	2564	2564	2564	2564	2564	2564	2564	2564	2564
	5	2657	2559	2483	2443	2430	2443	2483	2559	2657	2559	2483	2443	2430	2443	2483
	10	2654	2497	2306	2151	2091	2151	2306	2497	2654	2497	2306	2151	2091	2151	2306
	15	2646	2382	1988	1713	1620	1713	1988	2382	2646	2382	1988	1713	1620	1713	1988
	20	2635	2199	1582	1215	1093	1215	1582	2199	2635	2199	1582	1215	1093	1215	1582
	25	2608	1932	1118	736	635	736	1118	1932	2608	1932	1118	736	635	736	1118
	30	2554	1587	694	409	346	409	694	1587	2554	1587	694	409	346	409	694
	35	2445	1190	395	240	212	240	395	1190	2445	1190	395	240	212	240	395
	40	2248	794	244	173	159	173	244	794	2248	794	244	173	159	173	244
	45	1966	500	182	140	130	140	182	500	1966	500	182	140	130	140	182
	50	1627	321	144	113	105	113	144	321	1627	321	144	113	105	113	144
	55	1256	241	91	77	74	77	91	241	1256	241	91	77	74	77	91
	60	894	161	61	59	59	59	61	161	894	161	61	59	59	59	61
	65	592	92	54	54	54	54	54	92	592	92	54	54	54	54	54
	70	363	71	50	53	54	53	50	71	363	71	50	53	54	53	50
	75	205	62	48	56	57	56	48	62	205	62	48	56	57	56	48
	80	98	57	49	56	55	56	49	57	98	57	49	56	55	56	49
	85	30	55	43	53	55	53	43	55	30	55	43	53	55	53	43
	90	3	34	33	41	42	41	33	34	3	34	33	41	42	41	33
	95	2	2	16	25	23	25	16	2	2	2	16	25	23	25	16
	100	1	0	0	2	7	2	0	0	1	0	0	2	7	2	0
	105	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	110	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	115	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	120	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	125	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	130	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	135	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	140	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	145	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	150	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	155	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	160	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	165	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	170	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
	180	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	18400	18400
	45	19750	1699
	55	15480	1019
	65	9832	779
	75	5480	1003
	85	2193	1805



### 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	3336	3336	3336	3336	3256	3256	3256	3256	3108	3108	3108	2972	2972	2972	2848	2848	2848	2789
1	3113	3007	2911	2825	3038	2943	2857	2778	2823	2753	2689	2713	2657	2605	2612	2567	2526	2470
2	2903	2722	2571	2445	2834	2670	2532	2415	2572	2457	2358	2482	2387	2304	2399	2321	2252	2198
3	2711	2477	2296	2152	2647	2434	2267	2132	2353	2211	2095	2279	2159	2058	2210	2109	2023	1970
4	2536	2267	2070	1919	2478	2231	2048	1906	2164	2006	1880	2102	1966	1855	2044	1927	1831	1779
5	2377	2086	1882	1731	2324	2056	1865	1722	1999	1832	1703	1947	1801	1686	1898	1771	1668	1618
6	2234	1928	1722	1575	2186	1903	1709	1568	1855	1683	1555	1810	1658	1542	1769	1634	1529	1481
7	2104	1790	1587	1444	2060	1769	1576	1439	1728	1555	1429	1690	1535	1419	1654	1516	1410	1363
8	1986	1669	1469	1332	1947	1650	1461	1328	1615	1444	1321	1583	1427	1314	1552	1411	1306	1261
9	1879	1562	1367	1236	1843	1546	1360	1233	1516	1346	1227	1487	1332	1221	1460	1319	1216	1172
10	1782	1467	1278	1152	1750	1453	1272	1150	1426	1260	1145	1402	1249	1141	1378	1238	1136	1094

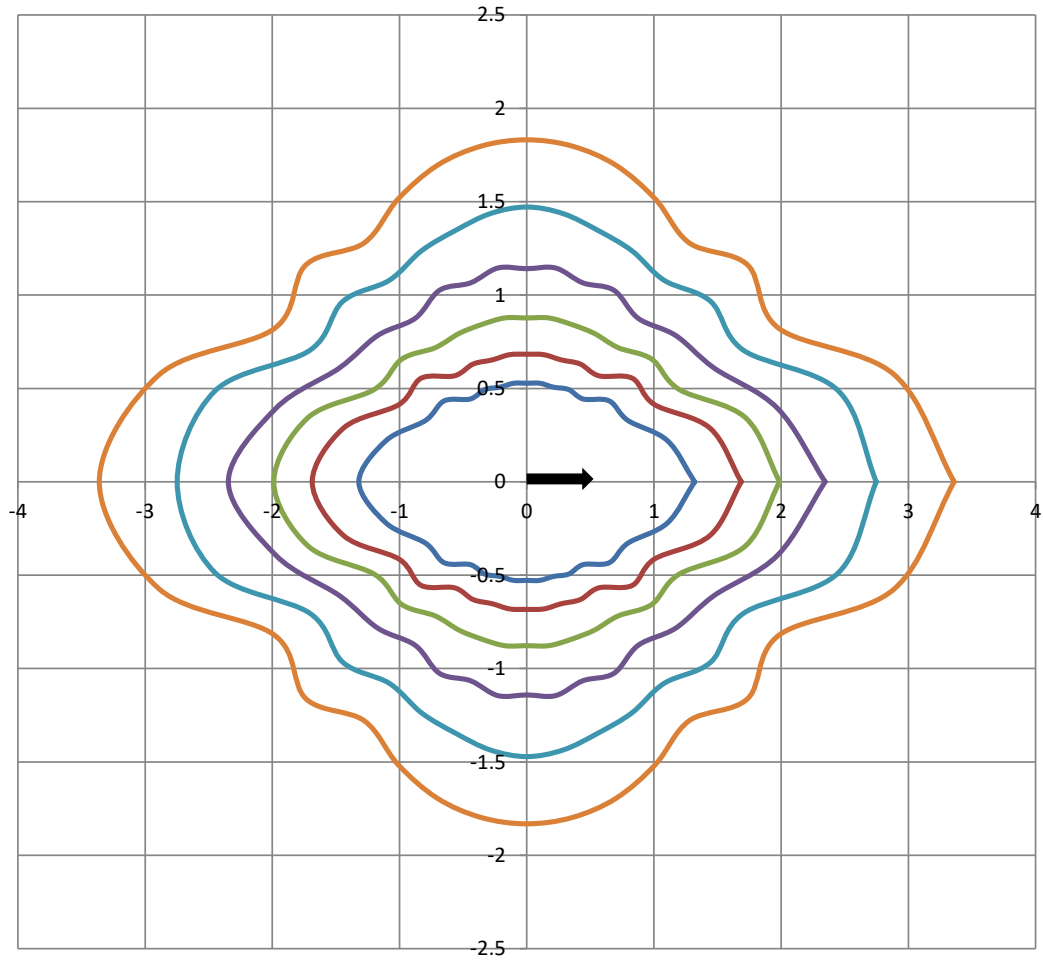
Beam and Field Information	
CIE Type:	Direct
Center Beam Intensity:	2564 Candela
Central Cone Intensity:	2544 Candela
Beam Flux:	1736.4 Lumens
Beam Angle (0-180):	109.3 Degrees
Beam Angle (90-270):	36.4 Degrees
Field Angle (0-180):	146.3 Degrees
Field Angle (90-270):	65.5 Degrees

Cone of Light Tabulation			
Mounting Height (Feet)		Footcandles at Nadir	Diameter (Feet)
4.00		160	3.17
6.00		71.2	4.76
8.00		40.1	6.34
10.0		25.6	7.93
12.0		17.8	9.51
14.0		13.1	11.1
16.0		10.0	12.7



## 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





## In-Situ Test

### In-Situ Test Conditions

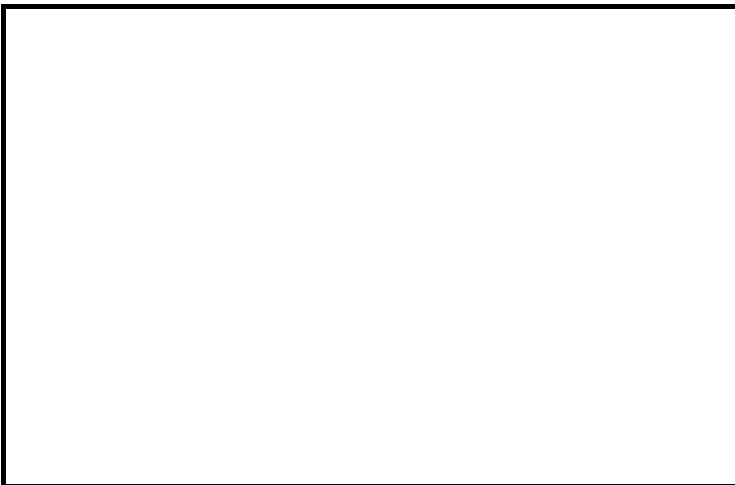
Temperature	Voltage	Current	Power	Power Factor	Frequency	Current THD
25.5 °C	121.3 VAC	N/A	N/A	N/A	60 Hz	N/A

### Summary of Results

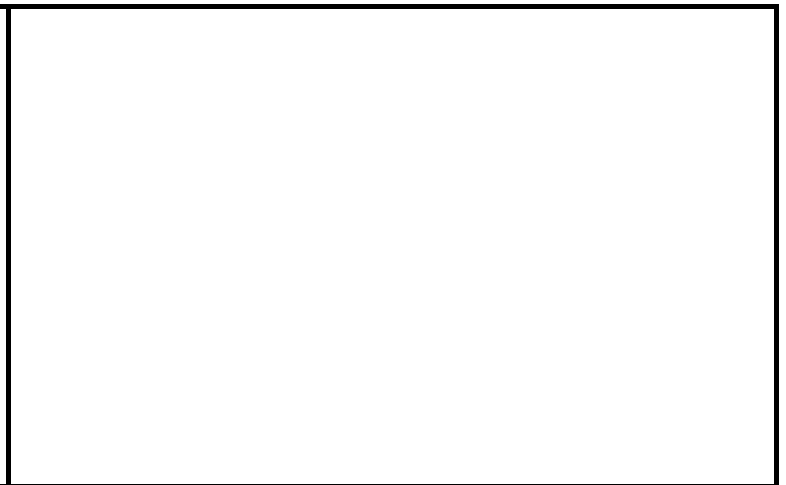
LED Temperature: 35.1 °C  
Driver Temperature: 42.7 °C  
Measured LED Current: 0.1088 A

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

#### LED Temperature Location



#### Thermocouple Reference



#### Driver Temperature Location

