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## Photometric Test Report

### Relevant Standards

IES LM-79-2008, ANSI C82.77-10-2014, CIE 13.3-1995  
CIE 15-2004, ANSI C78.377-2017, IES TM-30-2018

### Prepared For

#### **H E Williams Inc**

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United States

### Catalog Number

**MX2UD-4-L8/835U/L8/835D-F/D**

Order Number

13052732

Test Number

13052732.02

Test Date

2019-10-15

Prepared By

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Approved By

Alexa Lambert, 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 2-meter integrating sphere using the  $4\pi$  geometry method.  
Absorption correction was employed for Sphere measurement



**Luminaire Description:** Formed White aluminum housing, specular/frosted lens enclosures  
**Lamp:** 288 White LEDs  
**Mounting:** Pendant  
**Ballast/Driver:** Two Philips XI040C110V054BST1 Driver

**Luminaire**



**Luminaire Characteristics**

Luminous Length: 48.00 in.  
Luminous Width: 2.000 in.  
Luminous Height: 4.00 in.

**Summary of Results**

**Integrating Sphere**

Luminous Flux: 6036 Lumens  
Efficacy: 119.24 lm/w  
CCT: 3457 K  
CRI (Ra): 82.8

**Distribution**

Total Luminaire Output: 6137 Lumens  
Luminaire Efficacy: 121 lm/w  
Maximum Candela: 1338 Candela

**Electrical Data at 120 VAC**

Test Temperature: 25.9 °C  
Voltage: 120.0 VAC  
Current: 0.4250 A  
Power: 50.62 W  
Power Factor: 0.993  
Frequency: 60 Hz  
Current THD: 10.0 %



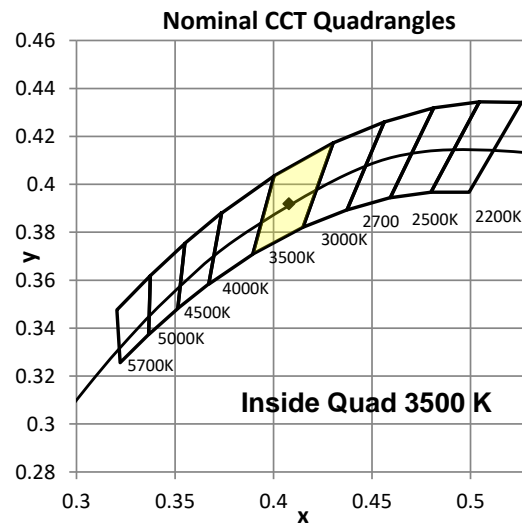
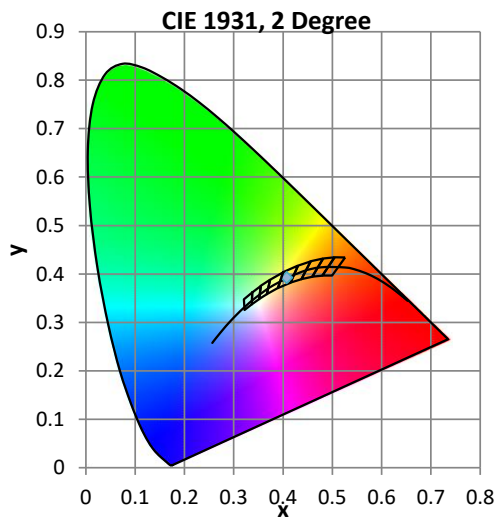
## Color Quality - Integrating Sphere

### Integrating Sphere Test Conditions

Temperature	Voltage	Current	Power	Power Factor	Frequency	Current THD
25.9 °C	120.0 VAC	0.4250 A	50.62 W	0.993	60 Hz	10.0 %

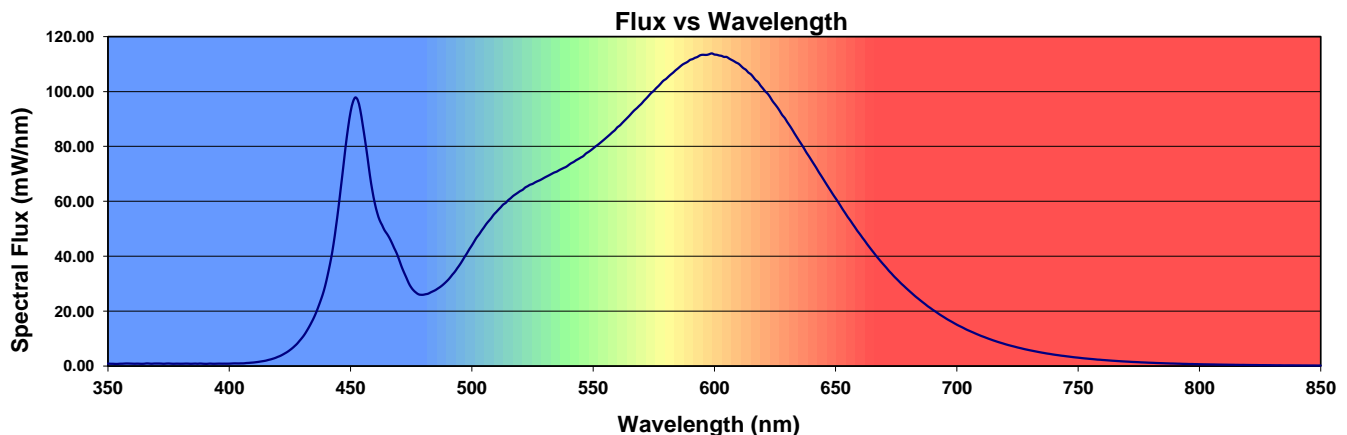
### Summary of Results

<b>Total Output:</b>	6036 Lumens	<b>Chromaticity (x):</b>	0.4077
<b>Efficacy:</b>	119.2 lm/w	<b>Chromaticity (y):</b>	0.3920
<b>CCT:</b>	3457 K	<b>Chromaticity (u'):</b>	0.2367
<b>CRI (Ra):</b>	82.8	<b>Chromaticity (v'):</b>	0.5122
<b>CRI (R9):</b>	6.4	<b>TM-30 Rf:</b>	84.2
<b>Peak Wavelength:</b>	599 nm	<b>TM-30 Rg:</b>	95.1
<b>Dominant Wavelength:</b>	581 nm	<b>Duv:</b>	0.0002
<b>S/P Ratio:</b>	1.52		



### Color Rendering Index Detail

Ra (CRI)	R1	R2	R3	R4	R5	R6	R7	R8	R9	R10	R11	R12	R13	R14	R15
82.8	81.1	90.3	96.2	80.9	81.2	87.2	84.1	61.1	6.4	77.4	80.2	65.0	83.4	98.4	74.0





## Distribution - Goniophotometer

### Distribution Test Conditions

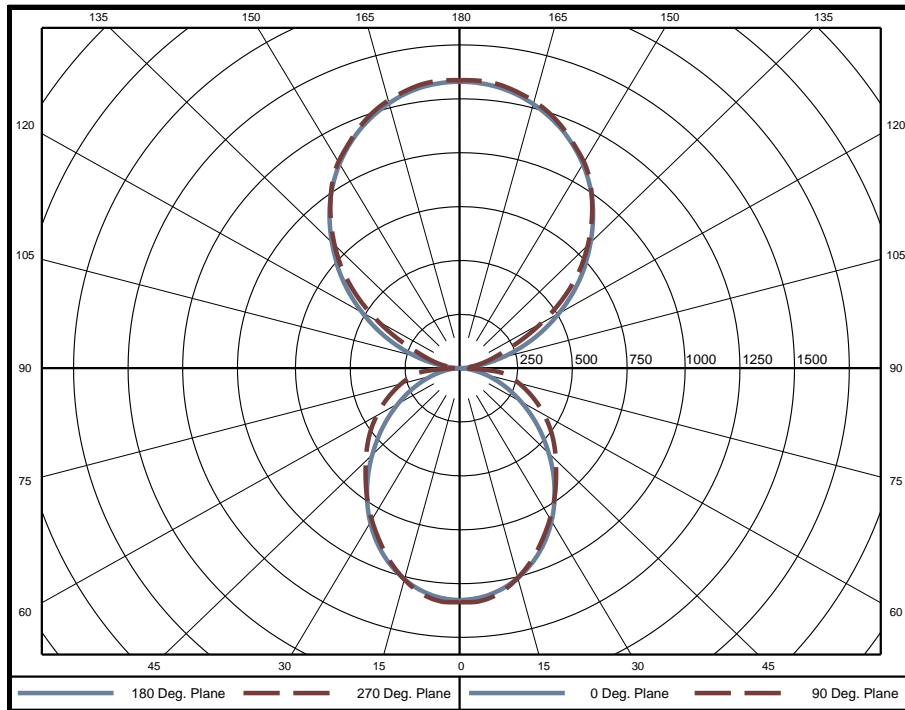
Temperature	Voltage	Current	Power	Power Factor	Frequency	Current THD
24.8 °C	120.1 VAC	0.4257 A	50.74 W	0.993	60 Hz	10.0 %

### Summary of Results

**Spacing Criteria**  
 0-180: 1.13  
 90-270: 1.12

**Total Lumen Output:** 6137 Lumens  
**Luminaire Efficacy:** 121.0 lm/w  
**Maximum Candela:** 1338 Candela

### Polar Plot



### Zonal Lumen Summary

Zone	Lumens	% of Luminaire	Zone	Lumens	% of Luminaire	Zone	Lumens	% of Luminaire
0-5	25.9	0.4%	60-65	172.4	2.8%	120-125	244.5	4.0%
5-10	76.3	1.2%	65-70	149.7	2.4%	125-130	281.0	4.6%
10-15	122.4	2.0%	70-75	125.2	2.0%	130-135	306.0	5.0%
15-20	161.8	2.6%	75-80	100.7	1.6%	135-140	319.9	5.2%
20-25	192.9	3.1%	80-85	76.8	1.3%	140-145	322.2	5.3%
25-30	215.2	3.5%	85-90	32.6	0.5%	145-150	311.1	5.1%
30-35	228.3	3.7%	90-95	8.7	0.1%	150-155	286.6	4.7%
35-40	232.8	3.8%	95-100	30.9	0.5%	155-160	251.5	4.1%
40-45	230.0	3.7%	100-105	64.2	1.0%	160-165	206.7	3.4%
45-50	222.0	3.6%	105-110	105.2	1.7%	165-170	153.6	2.5%
50-55	209.6	3.4%	110-115	151.7	2.5%	170-175	94.5	1.5%
55-60	192.8	3.1%	115-120	200.0	3.3%	175-180	31.8	0.5%

Zone	Lumens	% of Luminaire
0-40	1256	20.5%
0-60	2110	34.4%
0-90	2767	45.1%
90-180	3370	54.9%



### 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	1083	1083	1083	1083	1083	1083	1083	1083	1083	1083	1083	1083	1083	1083	1083
	5	1068	1079	1075	1081	1084	1081	1075	1079	1068	1079	1075	1081	1084	1081	1075
	10	1044	1056	1051	1055	1056	1055	1051	1056	1044	1056	1051	1055	1056	1055	1051
	15	1005	1019	1010	1009	1005	1009	1010	1019	1005	1019	1010	1009	1005	1009	1010
	20	953	967	953	947	942	947	953	967	953	967	953	947	942	947	953
	25	889	903	887	878	871	878	887	903	889	903	887	878	871	878	887
	30	813	829	814	807	801	807	814	829	813	829	814	807	801	807	814
	35	731	748	737	733	732	733	737	748	731	748	737	733	732	733	737
	40	644	663	660	662	663	662	660	663	644	663	660	662	663	662	660
	45	555	580	585	596	601	596	585	580	555	580	585	596	601	596	585
	50	471	501	518	537	544	537	518	501	471	501	518	537	544	537	518
	55	390	425	455	480	488	480	455	425	390	425	455	480	488	480	455
	60	314	354	393	422	431	422	393	354	314	354	393	422	431	422	393
	65	245	289	334	366	376	366	334	289	245	289	334	366	376	366	334
	70	180	227	279	312	322	312	279	227	180	227	279	312	322	312	279
	75	122	170	225	260	272	260	225	170	122	170	225	260	272	260	225
	80	70	120	177	213	226	213	177	120	70	120	177	213	226	213	177
	85	32	77	129	150	153	150	129	77	32	77	129	150	153	150	129
	90	7	22	32	38	41	38	32	22	7	22	32	38	41	38	32
	95	35	32	32	27	25	27	32	32	35	32	32	27	25	27	32
	100	107	105	75	73	72	73	75	105	107	105	75	73	72	73	75
	105	197	194	151	126	124	126	151	194	197	194	151	126	124	126	151
	110	295	292	256	201	188	201	256	292	295	292	256	201	188	201	256
	115	399	394	367	313	288	313	367	394	399	394	367	313	288	313	367
	120	503	501	480	440	416	440	480	501	503	501	480	440	416	440	480
	125	610	609	594	569	552	569	594	609	610	609	594	569	552	569	594
	130	716	719	707	693	683	693	707	719	716	719	707	693	683	693	707
	135	815	822	812	805	799	805	812	822	815	822	812	805	799	805	812
	140	916	925	917	912	909	912	917	925	916	925	917	912	909	912	917
	145	1009	1019	1014	1013	1013	1013	1014	1019	1009	1019	1014	1013	1013	1013	1014
	150	1090	1101	1096	1098	1102	1098	1096	1101	1090	1101	1096	1098	1102	1098	1096
	155	1160	1172	1168	1168	1168	1168	1168	1172	1160	1172	1168	1168	1168	1168	1172
	160	1220	1231	1229	1233	1233	1233	1229	1231	1220	1231	1229	1233	1233	1233	1229
	165	1267	1279	1277	1281	1281	1281	1277	1279	1267	1279	1277	1281	1281	1281	1277
	170	1303	1312	1309	1314	1315	1314	1309	1312	1303	1312	1309	1314	1315	1314	1309
	175	1324	1330	1326	1332	1336	1332	1326	1330	1324	1330	1326	1332	1336	1332	1326
	180	1333	1333	1333	1333	1333	1333	1333	1333	1333	1333	1333	1333	1333	1333	1333

### Average Luminance (cd/m<sup>2</sup>)

Horizontal Angle (Degrees)

Vertical Angle (Degrees)	0	45	90
	0	17490	17490
	45	11700	5404
	55	9815	4123
	65	7928	3071
	75	5788	2159
	85	2990	1343



### Coefficients of Utilization - 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 percent of total lumen output delivered to the task surface **																	
0	106	106	106	106	97	97	97	97	81	81	81	65	65	65	52	52	52	45
1	96	92	88	84	88	84	81	77	70	67	65	57	55	53	45	44	43	37
2	87	80	74	68	80	73	68	63	61	57	54	50	47	44	39	37	36	31
3	80	70	63	57	73	64	58	53	54	49	45	44	40	37	35	32	30	26
4	73	62	54	48	66	57	50	45	48	42	38	39	35	32	31	28	26	22
5	67	55	47	41	61	51	44	38	43	37	33	35	31	28	28	25	23	19
6	62	49	41	36	56	46	38	33	38	33	29	32	28	24	25	22	20	17
7	57	45	37	31	52	41	34	29	35	29	25	29	25	22	23	20	18	15
8	53	41	33	28	48	38	31	26	32	26	22	26	22	19	21	18	16	14
9	49	37	30	25	45	34	28	23	29	24	20	24	20	17	20	17	14	12
10	46	34	27	22	42	32	25	21	27	22	18	22	18	16	18	15	13	11

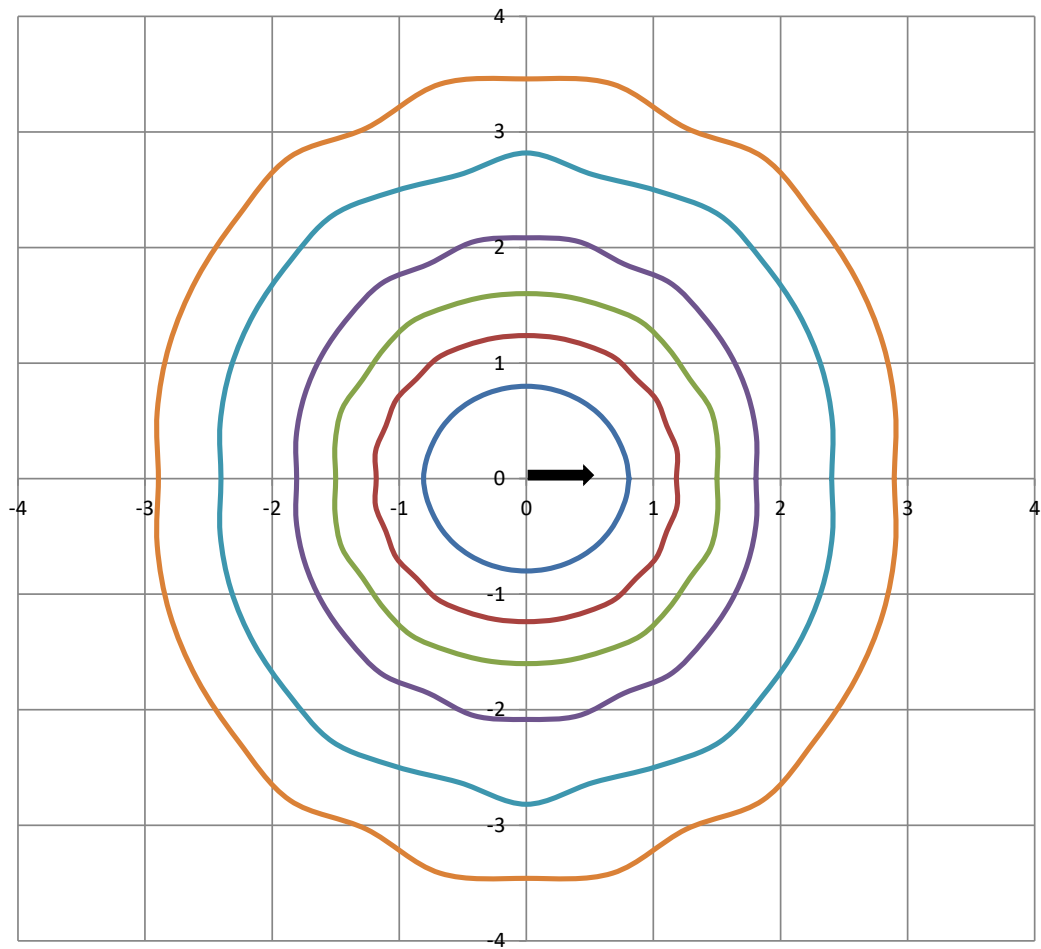
Beam and Field Information	
CIE Type:	Direct/Indirect
Center Beam Intensity:	1083 Candela
Central Cone Intensity:	1082 Candela
Beam Flux:	4306.9 Lumens
Beam Angle (0-180):	91.6 Degrees
Beam Angle (90-270):	100.5 Degrees
Field Angle (0-180):	152.4 Degrees
Field Angle (90-270):	172.5 Degrees

Cone of Light Tabulation			
Mounting Height (Feet)		Footcandles at Nadir	Diameter (Feet)
4.00		67.7	4.53
6.00		30.1	6.79
8.00		16.9	9.06
10.0		10.8	11.3
12.0		7.52	13.6
14.0		5.53	15.8
16.0		4.23	18.1



## 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