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## Photometric Test Report

### Relevant Standards

IES LM-79-2008, ANSI C82.77-2002, 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

**MDS-24-L200/840-SYM**

Order Number

12186363

Test Number

12186363.03

Test Date

2018-02-22

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



**Luminaire Description:** White formed steel housing, frosted patterned plastic lens enclosure  
**Lamp:** 336 white LEDs  
**Mounting:** Recessed  
**Ballast/Driver:** Philips XI095C275V054BSS1

**Luminaire**



**Luminaire Characteristics**

Luminous Length: 20.00 in.  
Luminous Width: 44.00 in.

**Summary of Results**

**Integrating Sphere**

Luminous Flux: 22120 Lumens  
Efficacy: 129.4 lm/w  
CCT: 4189 K  
CRI (Ra): 83.5

**Distribution**

Total Luminaire Output: 21760 Lumens  
Luminaire Efficacy: 127.2 lm/w  
Maximum Candela: 9414 Candela

**Electrical Data at 120 VAC**

Test Temperature: 24.8 °C  
Voltage: 120.0 VAC  
Current: 1.429 A  
Power: 170.9 W  
Power Factor: 0.997  
Frequency: 60 Hz  
Current THD: 5.98 %



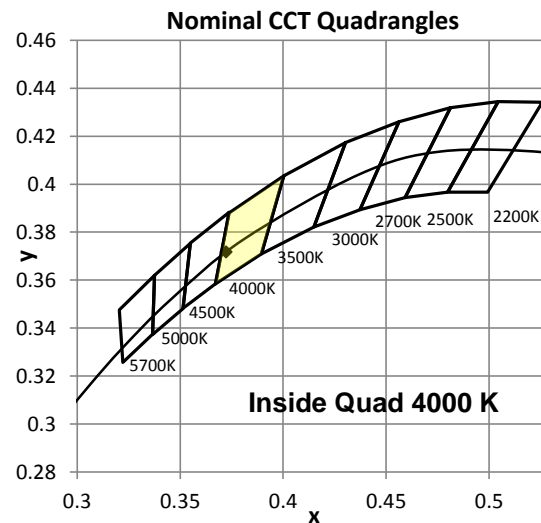
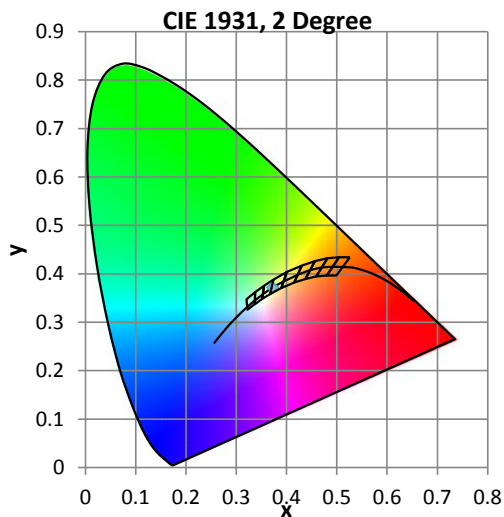
## Color Quality - Integrating Sphere

### Integrating Sphere Test Conditions

Temperature	Voltage	Current	Power	Power Factor	Frequency	Current THD
24.8 °C	120.0 VAC	1.429 A	170.9 W	0.997	60 Hz	5.98 %

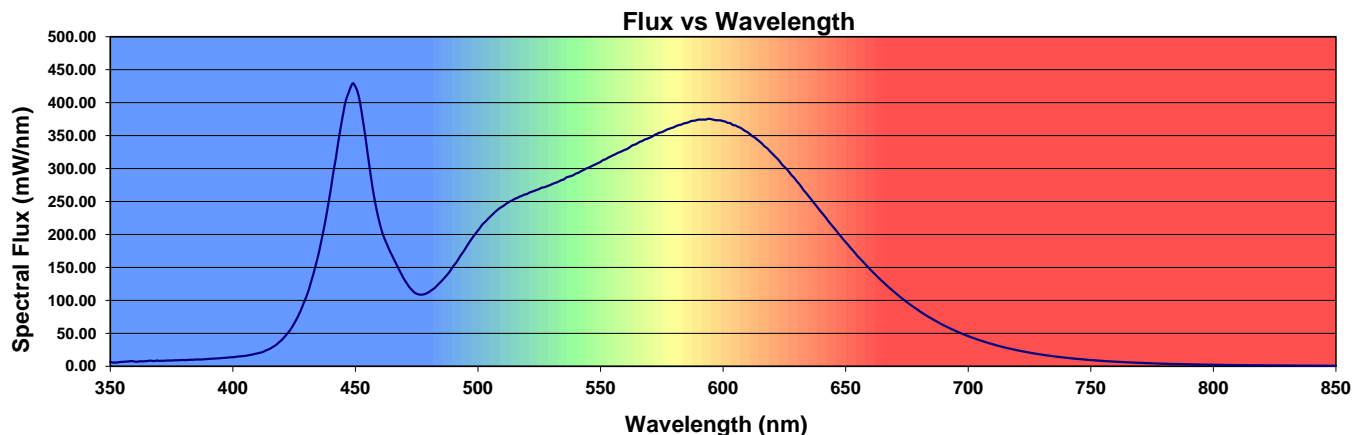
### Summary of Results

<b>Total Output:</b>	22120 Lumens	<b>Chromaticity (x):</b>	0.3724
<b>Efficacy:</b>	129.4 lm/w	<b>Chromaticity (y):</b>	0.3718
<b>CCT:</b>	4189 K	<b>Chromaticity (u'):</b>	0.2218
<b>CRI (Ra):</b>	83.5	<b>Chromaticity (v'):</b>	0.4982
<b>CRI (R9):</b>	10.1	<b>TM-30 Rf:</b>	83.1
<b>Peak Wavelength:</b>	449.1 nm	<b>TM-30 Rg:</b>	97
<b>Dominant Wavelength:</b>	578.3 nm	<b>Duv:</b>	0.0002
<b>S/P Ratio:</b>	1.741		



### Color Rendering Index Detail

Ra (CRI)	R1	R2	R3	R4	R5	R6	R7	R8	R9	R10	R11	R12	R13	R14	R15
83.5	81.9	88.6	94.1	83.6	82.5	84.8	86.5	66.2	10.1	73.5	83.3	67.0	83.3	96.8	75.5





## Distribution - Goniophotometer

### Distribution Test Conditions

Temperature	Voltage	Current	Power	Power Factor	Frequency	Current THD
24.5 °C	120.0 VAC	1.430 A	171.0 W	0.997	60 Hz	6.02 %

### Summary of Results

#### Spacing Criteria

0-180: 1.18

90-270: 1.17

#### Total Lumen Output:

21760 Lumens

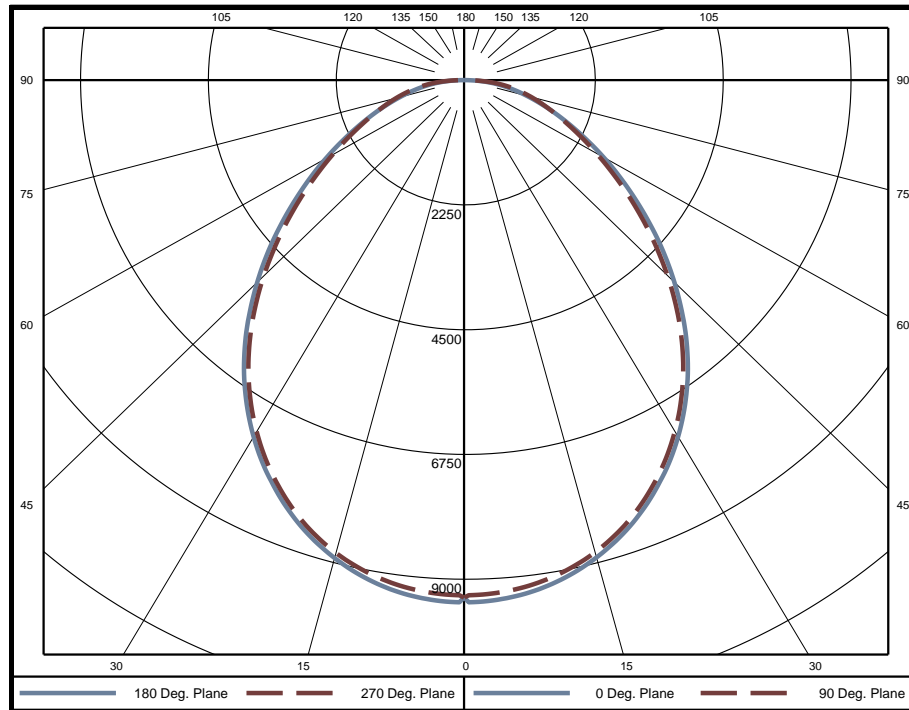
#### Luminaire Efficacy:

127.2 lm/w

#### Maximum Candela:

9414 Candela

### Polar Plot



### Zonal Lumen Summary

Zone	Lumens	% of Luminaire	Zone	Lumens	% of Luminaire	Zone	Lumens	% of Luminaire
0-5	222	1.0%	60-65	1146	5.3%	120-125	0	0.0%
5-10	658	3.0%	65-70	913	4.2%	125-130	0	0.0%
10-15	1064	4.9%	70-75	706	3.2%	130-135	0	0.0%
15-20	1421	6.5%	75-80	517	2.4%	135-140	0	0.0%
20-25	1713	7.9%	80-85	334	1.5%	140-145	0	0.0%
25-30	1927	8.9%	85-90	127	0.6%	145-150	0	0.0%
30-35	2050	9.4%	90-95	0	0.0%	150-155	0	0.0%
35-40	2076	9.5%	95-100	0	0.0%	155-160	0	0.0%
40-45	2006	9.2%	100-105	0	0.0%	160-165	0	0.0%
45-50	1851	8.5%	105-110	0	0.0%	165-170	0	0.0%
50-55	1638	7.5%	110-115	0	0.0%	170-175	0	0.0%
55-60	1395	6.4%	115-120	0	0.0%	175-180	0	0.0%

Zone	Lumens	% of Luminaire
0-40	11131	51.2%
0-60	18021	82.8%
0-90	21764	100.0%
90-180	0	0.0%



### 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	9327	9327	9327	9327	9327	9327	9327	9327	9327	9327	9327	9327	9327	9327	9327
	5	9357	9313	9244	9235	9233	9235	9244	9313	9357	9313	9244	9235	9233	9235	9244
	10	9183	9142	9080	9072	9071	9072	9080	9142	9183	9142	9080	9072	9071	9072	9080
	15	8890	8853	8796	8795	8796	8795	8796	8853	8890	8853	8796	8795	8796	8795	8796
	20	8492	8450	8395	8396	8402	8396	8395	8450	8492	8450	8395	8396	8402	8396	8395
	25	7980	7946	7890	7885	7888	7885	7890	7946	7980	7946	7890	7885	7888	7885	7890
	30	7383	7344	7282	7273	7278	7273	7282	7344	7383	7344	7282	7273	7278	7273	7282
	35	6694	6655	6588	6569	6574	6569	6588	6655	6694	6655	6588	6569	6574	6569	6588
	40	5925	5882	5815	5789	5786	5789	5815	5882	5925	5882	5815	5789	5786	5789	5815
	45	5101	5061	4990	4946	4942	4946	4990	5061	5101	5061	4990	4946	4942	4946	4990
	50	4274	4231	4157	4110	4101	4110	4157	4231	4274	4231	4157	4110	4101	4110	4157
	55	3480	3439	3368	3325	3318	3325	3368	3439	3480	3439	3368	3325	3318	3325	3368
	60	2761	2716	2652	2627	2629	2627	2652	2716	2761	2716	2652	2627	2629	2627	2652
	65	2122	2083	2036	2046	2052	2046	2036	2083	2122	2083	2036	2046	2052	2046	2036
	70	1590	1559	1534	1570	1595	1570	1534	1559	1590	1559	1534	1570	1595	1570	1534
	75	1140	1123	1123	1178	1214	1178	1123	1123	1140	1123	1123	1178	1214	1178	1123
	80	765	750	767	831	863	831	767	750	765	750	767	831	863	831	767
	85	400	394	414	481	484	481	414	394	400	394	414	481	484	481	414
	90	11	27	47	65	62	65	47	27	11	27	47	65	62	65	47
	95	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	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	16430	16430
	45	12710	12430
	55	10690	10340
	65	8845	8484
	75	7755	7640
	85	8077	8361



### 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	25908	25908	25908	25908	25305	25305	25305	25305	24181	24181	24181	23152	23152	23152	22207	22207	22207	21763
1	23788	22797	21910	21110	23200	22305	21498	20767	21384	20720	20112	20537	19997	19497	19757	19324	18919	18470
2	21777	20075	18666	17481	21215	19667	18372	17273	18902	17814	16873	18197	17289	16491	17544	16795	16127	15668
3	19974	17794	16107	14762	19446	17454	15890	14630	16814	15475	14373	16222	15083	14125	15673	14710	13886	13426
4	18383	15894	14072	12680	17895	15610	13908	12593	15072	13593	12422	14573	13292	12255	14108	13006	12093	11638
5	16980	14302	12430	11049	16534	14062	12303	10988	13608	12058	10870	13185	11824	10755	12790	11599	10642	10196
6	15739	12954	11084	9743	15333	12750	10984	9700	12364	10790	9616	12004	10604	9534	11667	10424	9453	9019
7	14638	11804	9967	8680	14270	11631	9887	8649	11301	9730	8587	10992	9580	8526	10702	9434	8466	8048
8	13662	10818	9029	7801	13328	10669	8964	7777	10386	8836	7731	10119	8713	7685	9869	8594	7640	7238
9	12792	9965	8233	7064	12490	9837	8180	7046	9592	8074	7011	9361	7972	6976	9143	7873	6941	6555
10	12015	9223	7553	6441	11742	9112	7508	6427	8899	7420	6399	8698	7334	6371	8508	7251	6344	5974

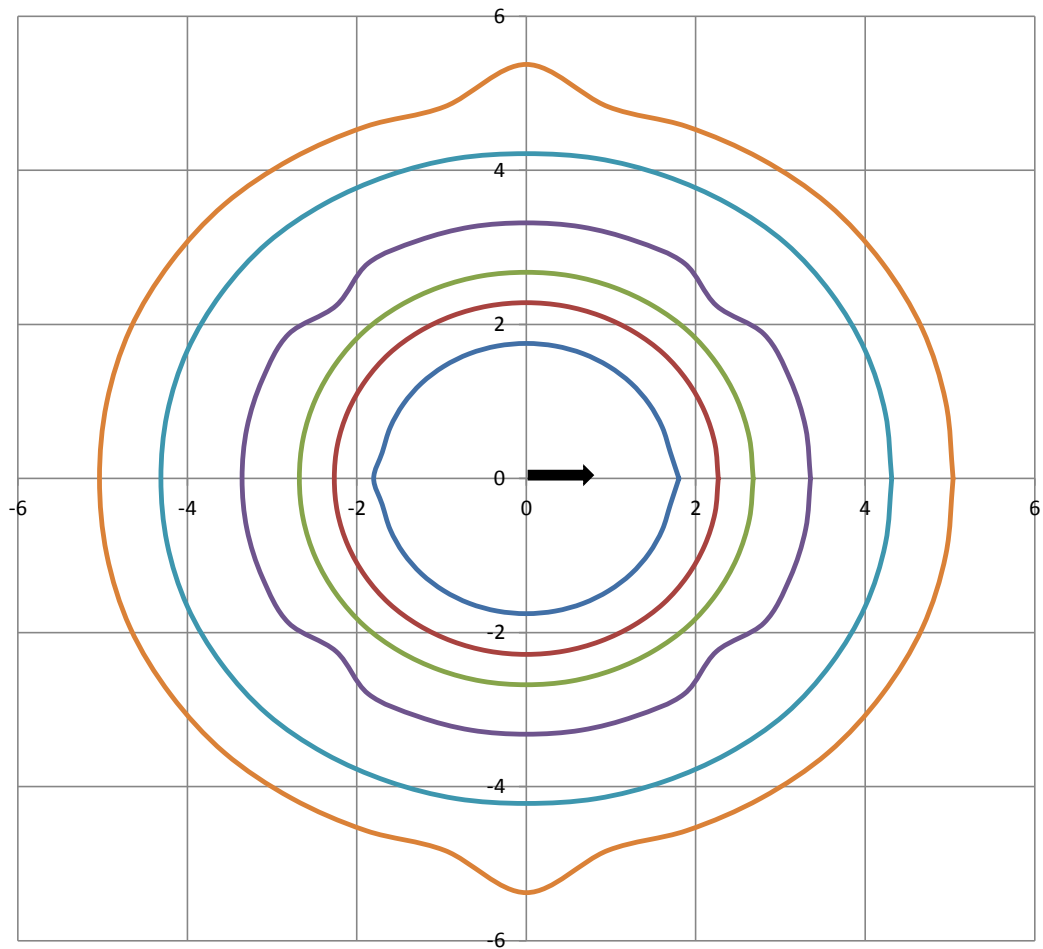
Beam and Field Information	
CIE Type:	Direct
Center Beam Intensity:	9327 Candela
Central Cone Intensity:	9308 Candela
Beam Flux:	13908.3 Lumens
Beam Angle (0-180):	95.3 Degrees
Beam Angle (90-270):	93.3 Degrees
Field Angle (0-180):	155.3 Degrees
Field Angle (90-270):	158.0 Degrees

Cone of Light Tabulation			
Mounting Height (Feet)		Footcandles at Nadir	Diameter (Feet)
4.00		583	4.69
6.00		259	7.03
8.00		146	9.37
10.0		93.3	11.7
12.0		64.8	14.1
14.0		47.6	16.4
16.0		36.4	18.7



## 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