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Indoor Distribution Test Report

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

Prepared For
H E Williams Inc

831 W Fairview Ave
PO Box 837
Carthage, MO 64836-0837
United States

Catalog Number
4PR-L20/835-DIM-UNV-L-M-OF-WH

Order Number
12316380
Test Number
12316380.31

Test Date

2018-06-13

Prepared By

Josh Mitchell, Technician

Approved By

Alexa Lambert, Project Handler

The results contained in this report pertain only to the tested sample.
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Luminaire Description: Black formed aluminum housing, clear plastic optic, white reflector, clear glass patterned lens enclosure
Lamp: One white LED
Mounting: Recessed
Ballast/Driver: Philips XI025C070V054DSM5

Luminaire



Luminaire Characteristics

Luminous Diameter: 4.25 in.

Summary of Results

| | |
|-------------------------|--------------|
| Total Luminaire Output: | 2130 Lumens |
| Luminaire Efficacy: | 93.6 lm/w |
| Maximum Candela: | 5004 Candela |

Test Conditions

| | |
|-------------------|-----------|
| Test Temperature: | 25.4 °C |
| Voltage: | 120.1 VAC |
| Current: | 0.1903 A |
| Power: | 22.76 W |
| Power Factor: | 0.996 |
| Frequency: | 60 Hz |
| Current THD: | 7.82 % |

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



Distribution - Goniophotometer

Distribution Test Conditions

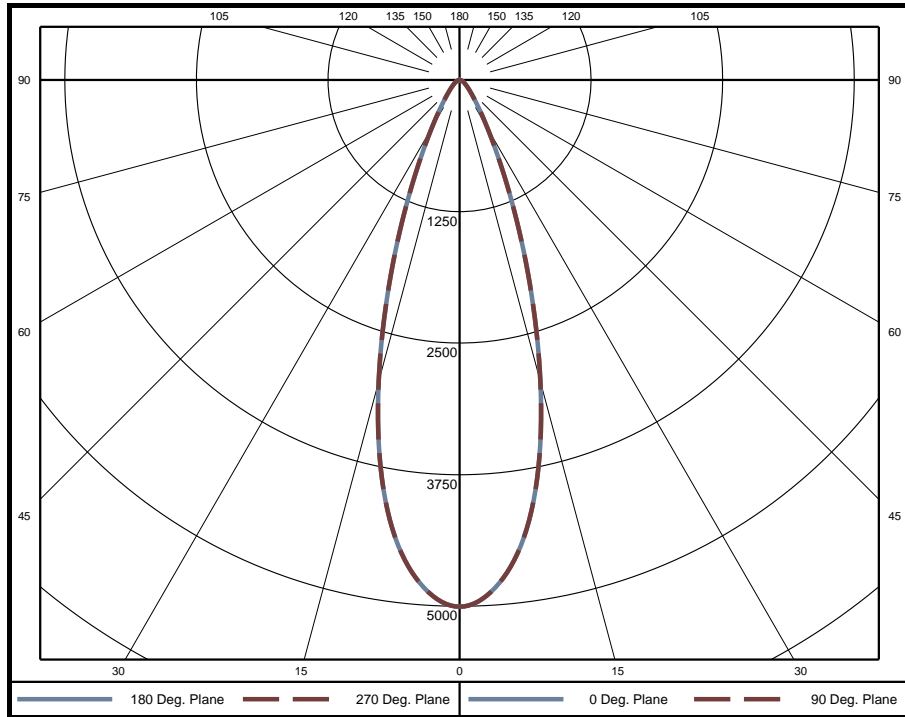
| Temperature | Voltage | Current | Power | Power Factor | Frequency | Current THD |
|-------------|-----------|----------|---------|--------------|-----------|-------------|
| 25.4 °C | 120.1 VAC | 0.1903 A | 22.76 W | 0.996 | 60 Hz | 7.82 % |

Summary of Results

Spacing Criteria
 0-180: 0.56
 90-270: 0.56

Total Lumen Output: 2130 Lumens
Luminaire Efficacy: 93.6 lm/w
Maximum Candela: 5004 Candela

Polar Plot



Zonal Lumen Summary

| Zone | Lumens | % of Luminaire | Zone | Lumens | % of Luminaire | Zone | Lumens | % of Luminaire |
|-------|--------|----------------|---------|--------|----------------|---------|--------|----------------|
| 0-5 | 116.6 | 5.5% | 60-65 | 20.7 | 1.0% | 120-125 | 0 | 0.0% |
| 5-10 | 315.2 | 14.8% | 65-70 | 16.3 | 0.8% | 125-130 | 0 | 0.0% |
| 10-15 | 415.1 | 19.5% | 70-75 | 12.2 | 0.6% | 130-135 | 0 | 0.0% |
| 15-20 | 390.0 | 18.3% | 75-80 | 8.2 | 0.4% | 135-140 | 0 | 0.0% |
| 20-25 | 289.3 | 13.6% | 80-85 | 4.3 | 0.2% | 140-145 | 0 | 0.0% |
| 25-30 | 186.5 | 8.8% | 85-90 | 1.5 | 0.1% | 145-150 | 0 | 0.0% |
| 30-35 | 118.2 | 5.5% | 90-95 | 0 | 0.0% | 150-155 | 0 | 0.0% |
| 35-40 | 78.9 | 3.7% | 95-100 | 0 | 0.0% | 155-160 | 0 | 0.0% |
| 40-45 | 56.3 | 2.6% | 100-105 | 0 | 0.0% | 160-165 | 0 | 0.0% |
| 45-50 | 42.3 | 2.0% | 105-110 | 0 | 0.0% | 165-170 | 0 | 0.0% |
| 50-55 | 32.8 | 1.5% | 110-115 | 0 | 0.0% | 170-175 | 0 | 0.0% |
| 55-60 | 25.9 | 1.2% | 115-120 | 0 | 0.0% | 175-180 | 0 | 0.0% |

| Zone | Lumens | % of Luminaire |
|--------|--------|----------------|
| 0-40 | 1910 | 89.7% |
| 0-60 | 2067 | 97.0% |
| 0-90 | 2130 | 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 | 5004 | 5004 | 5004 | 5004 | 5004 | 5004 | 5004 | 5004 | 5004 | 5004 | 5004 | 5004 | 5004 | 5004 | 5004 | 5004 |
| 5 | 4751 | 4751 | 4751 | 4751 | 4751 | 4751 | 4751 | 4751 | 4751 | 4751 | 4751 | 4751 | 4751 | 4751 | 4751 | 4751 |
| 10 | 4055 | 4055 | 4055 | 4055 | 4055 | 4055 | 4055 | 4055 | 4055 | 4055 | 4055 | 4055 | 4055 | 4055 | 4055 | 4055 |
| 15 | 2968 | 2968 | 2968 | 2968 | 2968 | 2968 | 2968 | 2968 | 2968 | 2968 | 2968 | 2968 | 2968 | 2968 | 2968 | 2968 |
| 20 | 1843 | 1843 | 1843 | 1843 | 1843 | 1843 | 1843 | 1843 | 1843 | 1843 | 1843 | 1843 | 1843 | 1843 | 1843 | 1843 |
| 25 | 1007 | 1007 | 1007 | 1007 | 1007 | 1007 | 1007 | 1007 | 1007 | 1007 | 1007 | 1007 | 1007 | 1007 | 1007 | 1007 |
| 30 | 534 | 534 | 534 | 534 | 534 | 534 | 534 | 534 | 534 | 534 | 534 | 534 | 534 | 534 | 534 | 534 |
| 35 | 302 | 302 | 302 | 302 | 302 | 302 | 302 | 302 | 302 | 302 | 302 | 302 | 302 | 302 | 302 | 302 |
| 40 | 186 | 186 | 186 | 186 | 186 | 186 | 186 | 186 | 186 | 186 | 186 | 186 | 186 | 186 | 186 | 186 |
| 45 | 125 | 125 | 125 | 125 | 125 | 125 | 125 | 125 | 125 | 125 | 125 | 125 | 125 | 125 | 125 | 125 |
| 50 | 88 | 88 | 88 | 88 | 88 | 88 | 88 | 88 | 88 | 88 | 88 | 88 | 88 | 88 | 88 | 88 |
| 55 | 64 | 64 | 64 | 64 | 64 | 64 | 64 | 64 | 64 | 64 | 64 | 64 | 64 | 64 | 64 | 64 |
| 60 | 49 | 49 | 49 | 49 | 49 | 49 | 49 | 49 | 49 | 49 | 49 | 49 | 49 | 49 | 49 | 49 |
| 65 | 37 | 37 | 37 | 37 | 37 | 37 | 37 | 37 | 37 | 37 | 37 | 37 | 37 | 37 | 37 | 37 |
| 70 | 28 | 28 | 28 | 28 | 28 | 28 | 28 | 28 | 28 | 28 | 28 | 28 | 28 | 28 | 28 | 28 |
| 75 | 19 | 19 | 19 | 19 | 19 | 19 | 19 | 19 | 19 | 19 | 19 | 19 | 19 | 19 | 19 | 19 |
| 80 | 11 | 11 | 11 | 11 | 11 | 11 | 11 | 11 | 11 | 11 | 11 | 11 | 11 | 11 | 11 | 11 |
| 85 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 |
| 90 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 95 | 0 | 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 | 0 |
| 105 | 0 | 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 | 0 |
| 115 | 0 | 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 | 0 |
| 125 | 0 | 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 | 0 |
| 135 | 0 | 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 | 0 |
| 145 | 0 | 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 | 0 |
| 155 | 0 | 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 | 0 |
| 165 | 0 | 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 | 0 |
| 175 | 0 | 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 | 0 |

Average Luminance (cd/m²)

Horizontal Angle (Degrees)

Vertical Angle (Degrees)

| | 0 | 45 | 90 |
|----|--------|--------|--------|
| 0 | 546800 | 546800 | 546800 |
| 45 | 19280 | 19280 | 19280 |
| 55 | 12280 | 12280 | 12280 |
| 65 | 9581 | 9581 | 9581 |
| 75 | 8122 | 8122 | 8122 |
| 85 | 6026 | 6026 | 6026 |



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 | 119 | 119 | 119 | 119 | 116 | 116 | 116 | 116 | 111 | 111 | 111 | 106 | 106 | 106 | 102 | 102 | 102 | 100 |
| 1 | 114 | 111 | 109 | 106 | 111 | 109 | 107 | 105 | 105 | 103 | 101 | 101 | 100 | 98 | 98 | 97 | 96 | 94 |
| 2 | 109 | 104 | 100 | 97 | 106 | 102 | 99 | 96 | 99 | 96 | 94 | 96 | 94 | 92 | 93 | 91 | 90 | 88 |
| 3 | 104 | 98 | 93 | 89 | 102 | 96 | 92 | 89 | 94 | 90 | 87 | 91 | 88 | 86 | 89 | 87 | 84 | 83 |
| 4 | 99 | 92 | 87 | 83 | 97 | 91 | 86 | 83 | 89 | 85 | 82 | 87 | 84 | 81 | 85 | 82 | 80 | 78 |
| 5 | 95 | 87 | 82 | 78 | 93 | 86 | 81 | 78 | 85 | 80 | 77 | 83 | 79 | 76 | 82 | 78 | 76 | 74 |
| 6 | 91 | 83 | 78 | 74 | 90 | 82 | 77 | 73 | 81 | 76 | 73 | 79 | 76 | 72 | 78 | 75 | 72 | 71 |
| 7 | 87 | 79 | 74 | 70 | 86 | 78 | 73 | 70 | 77 | 73 | 69 | 76 | 72 | 69 | 75 | 71 | 69 | 67 |
| 8 | 84 | 76 | 70 | 67 | 83 | 75 | 70 | 66 | 74 | 69 | 66 | 73 | 69 | 66 | 72 | 68 | 66 | 64 |
| 9 | 81 | 72 | 67 | 64 | 80 | 72 | 67 | 64 | 71 | 66 | 63 | 70 | 66 | 63 | 69 | 66 | 63 | 62 |
| 10 | 78 | 69 | 64 | 61 | 77 | 69 | 64 | 61 | 68 | 64 | 61 | 68 | 63 | 61 | 67 | 63 | 60 | 59 |

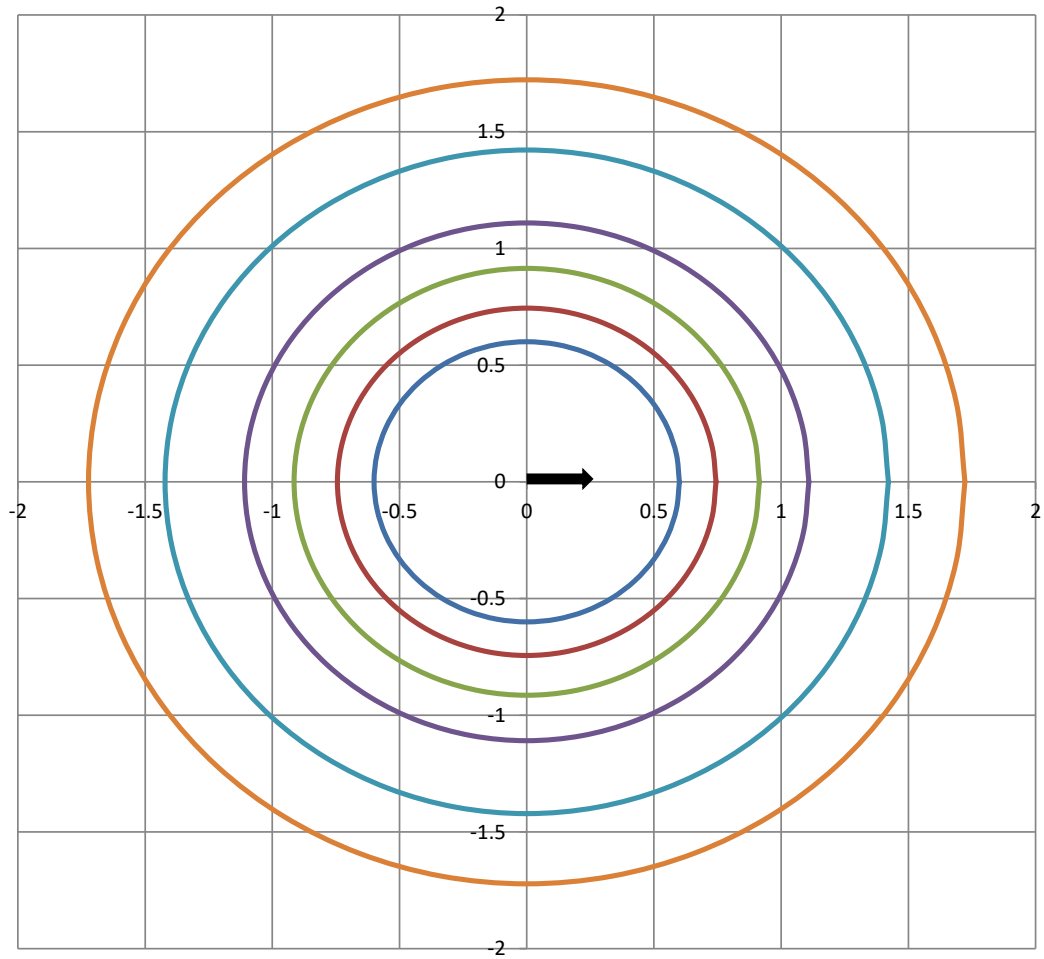
| Beam and Field Information | |
|----------------------------|---------------|
| CIE Type: | Direct |
| Center Beam Intensity: | 5004 Candela |
| Central Cone Intensity: | 4913 Candela |
| Beam Flux: | 1007.3 Lumens |
| Beam Angle (0-180): | 34.0 Degrees |
| Beam Angle (90-270): | 34.0 Degrees |
| Field Angle (0-180): | 61.1 Degrees |
| Field Angle (90-270): | 61.1 Degrees |

| Cone of Light Tabulation | | | |
|--------------------------|--|----------------------|-----------------|
| Mounting Height (Feet) | | Footcandles at Nadir | Diameter (Feet) |
| 4.00 | | 313 | 2.25 |
| 6.00 | | 139 | 3.37 |
| 8.00 | | 78.2 | 4.50 |
| 10.0 | | 50.0 | 5.62 |
| 12.0 | | 34.8 | 6.74 |
| 14.0 | | 25.5 | 7.87 |
| 16.0 | | 19.5 | 8.99 |



ISOFootcandle Plot

Mounting Height - 8 Feet



Grid Lines in Units of Mounting Height

