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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-W-OF-WH

Order Number
12316380
Test Number
12316380.29

Test Date

2018-06-12

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, 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: | 1830 Lumens |
| Luminaire Efficacy: | 80.4 lm/w |
| Maximum Candela: | 1465 Candela |

Test Conditions

| | |
|-------------------|-----------|
| Test Temperature: | 25.3 °C |
| Voltage: | 120.1 VAC |
| Current: | 0.1904 A |
| Power: | 22.77 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 |
|-------------|-----------|----------|---------|--------------|-----------|-------------|
| 25.3 °C | 120.1 VAC | 0.1904 A | 22.77 W | 0.996 | 60 Hz | 7.82 % |

Summary of Results

Spacing Criteria

0-180: 0.87

90-270: 0.87

Total Lumen Output:

1830 Lumens

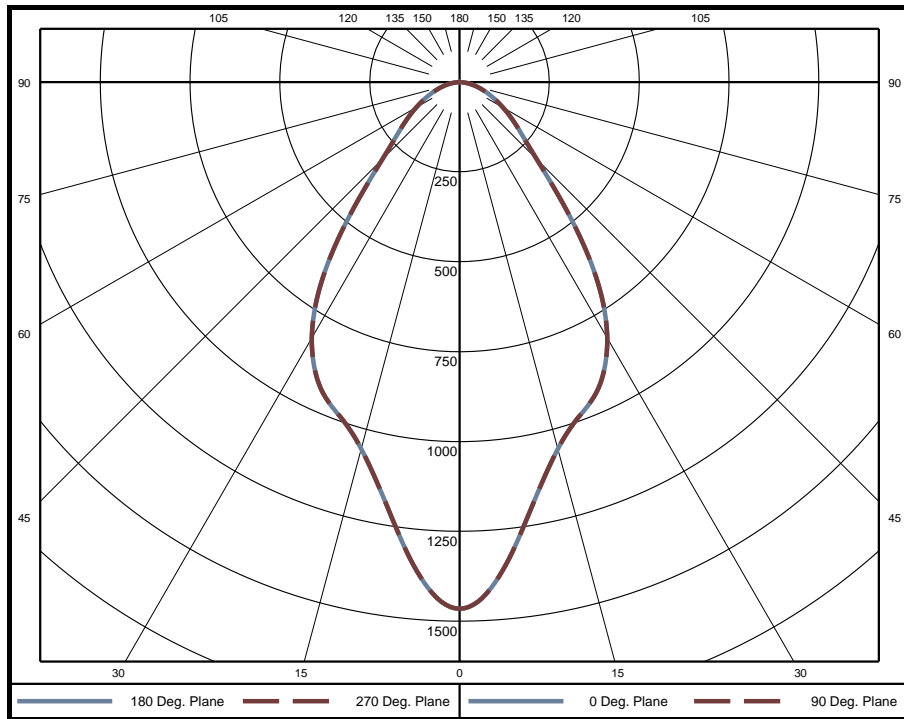
Luminaire Efficacy:

80.4 lm/w

Maximum Candela:

1465 Candela

Polar Plot



Zonal Lumen Summary

| Zone | Lumens | % of Luminaire | Zone | Lumens | % of Luminaire | Zone | Lumens | % of Luminaire |
|-------|--------|----------------|---------|--------|----------------|---------|--------|----------------|
| 0-5 | 33.8 | 1.8% | 60-65 | 58.4 | 3.2% | 120-125 | 0 | 0.0% |
| 5-10 | 90.6 | 5.0% | 65-70 | 45.2 | 2.5% | 125-130 | 0 | 0.0% |
| 10-15 | 132.0 | 7.2% | 70-75 | 33.1 | 1.8% | 130-135 | 0 | 0.0% |
| 15-20 | 167.2 | 9.1% | 75-80 | 22.1 | 1.2% | 135-140 | 0 | 0.0% |
| 20-25 | 200.8 | 11.0% | 80-85 | 12.0 | 0.7% | 140-145 | 0 | 0.0% |
| 25-30 | 221.9 | 12.1% | 85-90 | 3.9 | 0.2% | 145-150 | 0 | 0.0% |
| 30-35 | 219.6 | 12.0% | 90-95 | 0 | 0.0% | 150-155 | 0 | 0.0% |
| 35-40 | 186.8 | 10.2% | 95-100 | 0 | 0.0% | 155-160 | 0 | 0.0% |
| 40-45 | 138.3 | 7.6% | 100-105 | 0 | 0.0% | 160-165 | 0 | 0.0% |
| 45-50 | 105.0 | 5.7% | 105-110 | 0 | 0.0% | 165-170 | 0 | 0.0% |
| 50-55 | 87.1 | 4.8% | 110-115 | 0 | 0.0% | 170-175 | 0 | 0.0% |
| 55-60 | 72.6 | 4.0% | 115-120 | 0 | 0.0% | 175-180 | 0 | 0.0% |

| Zone | Lumens | % of Luminaire |
|--------|--------|----------------|
| 0-40 | 1253 | 68.5% |
| 0-60 | 1656 | 90.5% |
| 0-90 | 1830 | 100.0% |
| 90-180 | 0 | 0.0% |



Candela Tabulation

Horizontal Angle (Degrees)

| Vertical Angle (Degrees) | Horizontal 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 | 1465 | 1465 | 1465 | 1465 | 1465 | 1465 | 1465 | 1465 | 1465 | 1465 | 1465 | 1465 | 1465 | 1465 | 1465 | 1465 |
| 5 | 1365 | 1365 | 1365 | 1365 | 1365 | 1365 | 1365 | 1365 | 1365 | 1365 | 1365 | 1365 | 1365 | 1365 | 1365 | 1365 |
| 10 | 1187 | 1187 | 1187 | 1187 | 1187 | 1187 | 1187 | 1187 | 1187 | 1187 | 1187 | 1187 | 1187 | 1187 | 1187 | 1187 |
| 15 | 1057 | 1057 | 1057 | 1057 | 1057 | 1057 | 1057 | 1057 | 1057 | 1057 | 1057 | 1057 | 1057 | 1057 | 1057 | 1057 |
| 20 | 985 | 985 | 985 | 985 | 985 | 985 | 985 | 985 | 985 | 985 | 985 | 985 | 985 | 985 | 985 | 985 |
| 25 | 926 | 926 | 926 | 926 | 926 | 926 | 926 | 926 | 926 | 926 | 926 | 926 | 926 | 926 | 926 | 926 |
| 30 | 822 | 822 | 822 | 822 | 822 | 822 | 822 | 822 | 822 | 822 | 822 | 822 | 822 | 822 | 822 | 822 |
| 35 | 663 | 663 | 663 | 663 | 663 | 663 | 663 | 663 | 663 | 663 | 663 | 663 | 663 | 663 | 663 | 663 |
| 40 | 460 | 460 | 460 | 460 | 460 | 460 | 460 | 460 | 460 | 460 | 460 | 460 | 460 | 460 | 460 | 460 |
| 45 | 304 | 304 | 304 | 304 | 304 | 304 | 304 | 304 | 304 | 304 | 304 | 304 | 304 | 304 | 304 | 304 |
| 50 | 226 | 226 | 226 | 226 | 226 | 226 | 226 | 226 | 226 | 226 | 226 | 226 | 226 | 226 | 226 | 226 |
| 55 | 178 | 178 | 178 | 178 | 178 | 178 | 178 | 178 | 178 | 178 | 178 | 178 | 178 | 178 | 178 | 178 |
| 60 | 138 | 138 | 138 | 138 | 138 | 138 | 138 | 138 | 138 | 138 | 138 | 138 | 138 | 138 | 138 | 138 |
| 65 | 104 | 104 | 104 | 104 | 104 | 104 | 104 | 104 | 104 | 104 | 104 | 104 | 104 | 104 | 104 | 104 |
| 70 | 76 | 76 | 76 | 76 | 76 | 76 | 76 | 76 | 76 | 76 | 76 | 76 | 76 | 76 | 76 | 76 |
| 75 | 52 | 52 | 52 | 52 | 52 | 52 | 52 | 52 | 52 | 52 | 52 | 52 | 52 | 52 | 52 | 52 |
| 80 | 31 | 31 | 31 | 31 | 31 | 31 | 31 | 31 | 31 | 31 | 31 | 31 | 31 | 31 | 31 | 31 |
| 85 | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 13 |
| 90 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 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) | Horizontal Angle (Degrees) | | |
|--------------------------|----------------------------|--------|--------|
| | 0 | 45 | 90 |
| 0 | 160100 | 160100 | 160100 |
| 45 | 46990 | 46990 | 46990 |
| 55 | 33820 | 33820 | 33820 |
| 65 | 26850 | 26850 | 26850 |
| 75 | 21910 | 21910 | 21910 |
| 85 | 16210 | 16210 | 16210 |



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 | 111 | 107 | 104 | 101 | 109 | 105 | 102 | 99 | 101 | 99 | 96 | 97 | 95 | 93 | 94 | 92 | 91 | 89 |
| 2 | 103 | 97 | 91 | 87 | 101 | 95 | 90 | 86 | 92 | 88 | 84 | 89 | 85 | 82 | 86 | 83 | 80 | 78 |
| 3 | 96 | 88 | 81 | 76 | 94 | 86 | 80 | 75 | 83 | 78 | 74 | 81 | 76 | 73 | 78 | 75 | 72 | 70 |
| 4 | 90 | 80 | 73 | 67 | 88 | 79 | 72 | 67 | 76 | 71 | 66 | 74 | 69 | 65 | 72 | 68 | 64 | 62 |
| 5 | 84 | 73 | 66 | 60 | 82 | 72 | 65 | 60 | 70 | 64 | 59 | 68 | 63 | 59 | 67 | 62 | 58 | 56 |
| 6 | 78 | 67 | 60 | 54 | 77 | 66 | 59 | 54 | 65 | 58 | 54 | 63 | 58 | 53 | 62 | 57 | 53 | 51 |
| 7 | 74 | 62 | 55 | 49 | 72 | 61 | 54 | 49 | 60 | 54 | 49 | 59 | 53 | 49 | 57 | 52 | 48 | 47 |
| 8 | 69 | 58 | 50 | 45 | 68 | 57 | 50 | 45 | 56 | 49 | 45 | 55 | 49 | 45 | 54 | 48 | 44 | 43 |
| 9 | 65 | 54 | 46 | 42 | 64 | 53 | 46 | 42 | 52 | 46 | 41 | 51 | 45 | 41 | 50 | 45 | 41 | 39 |
| 10 | 62 | 50 | 43 | 39 | 61 | 50 | 43 | 38 | 49 | 43 | 38 | 48 | 42 | 38 | 47 | 42 | 38 | 36 |

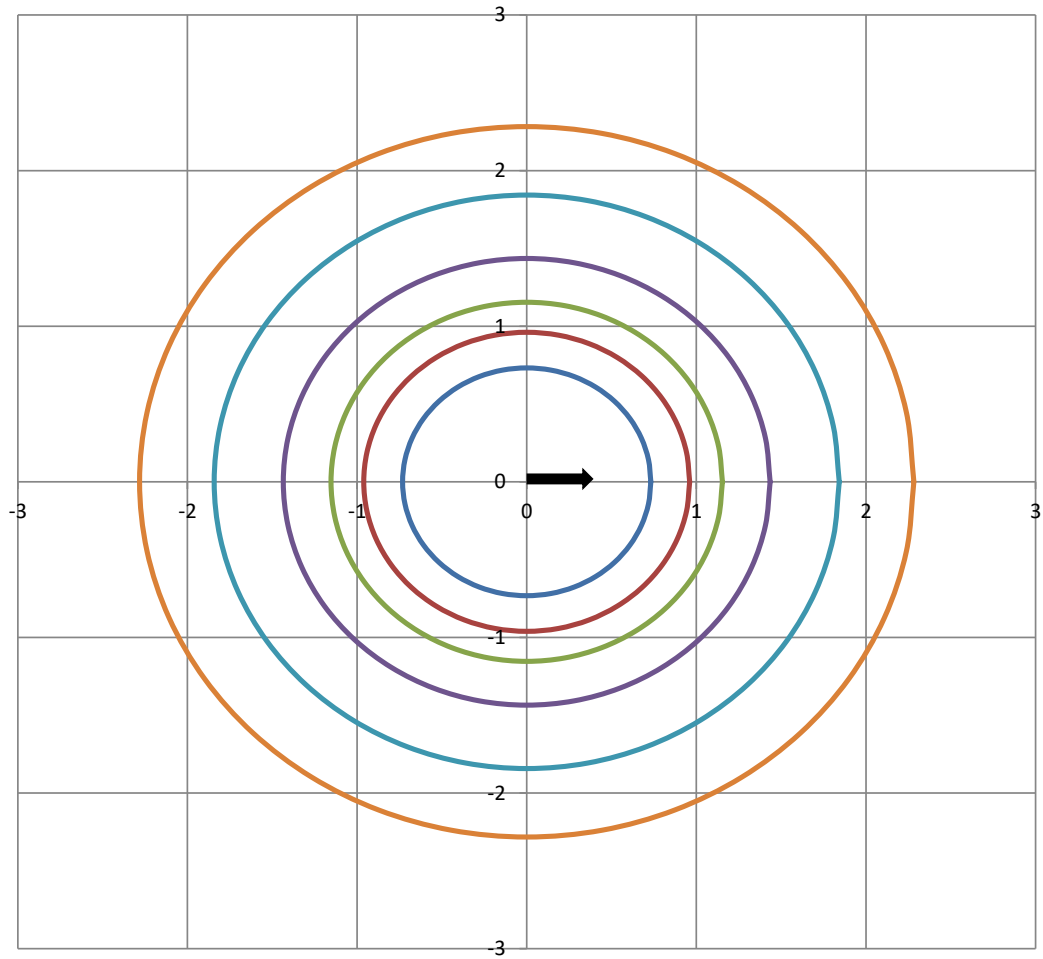
| Beam and Field Information | |
|----------------------------|---------------|
| CIE Type: | Direct |
| Center Beam Intensity: | 1465 Candela |
| Central Cone Intensity: | 1428 Candela |
| Beam Flux: | 982.2 Lumens |
| Beam Angle (0-180): | 66.1 Degrees |
| Beam Angle (90-270): | 66.1 Degrees |
| Field Angle (0-180): | 117.7 Degrees |
| Field Angle (90-270): | 117.7 Degrees |

| Cone of Light Tabulation | | | |
|--------------------------|--|----------------------|-----------------|
| Mounting Height (Feet) | | Footcandles at Nadir | Diameter (Feet) |
| 4.00 | | 91.6 | 3.47 |
| 6.00 | | 40.7 | 5.20 |
| 8.00 | | 22.9 | 6.93 |
| 10.0 | | 14.7 | 8.67 |
| 12.0 | | 10.2 | 10.4 |
| 14.0 | | 7.48 | 12.1 |
| 16.0 | | 5.72 | 13.9 |



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