



UL Verification Services Inc.  
7036 Snowdrift Road  
Allentown, PA 18106  
610-774-1300

## Photometric Test Report

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

**Prepared For**  
**Auroralight Inc**

2742 Loker Ave W  
#100  
Carlsbad, CA 92010-6619  
United States

**Catalog Number**  
**HSL11-4-W-45 (4W, 40° OPTIC, 4500K)**

Order Number  
12250114  
Test Number  
12250114.37

Report Date

2018-05-07

Prepared By

Sean Gregory, Project Handler

Approved By

Alexa Lambert, Project Handler

The results contained in this report pertain only to the tested sample.  
This report shall not be reproduced, except in full, without written approval of Underwriters Laboratories.  
This report must not be used by the client to claim product certification, approval, or endorsement by  
NVLAP, NIST, or any agency of the Federal Government.



**Luminaire Description:** Cylindrical metal housing, with adjustable knuckle, clear glass lens and internal LED module

**Lamp:** One (1) Cree XHP 4500K LED with 40°, wide optic

**Mounting:** Flood

**Ballast/Driver:** Integrated

**Note:** This report has been pro-rated using data from report numbers 12250114.35, 12250114.01, 12250114.02, 12250114.03, 12250114.04, 12250114.05, and 12250114.06 to account for differences in color temperature.

**Luminaire**



**Luminaire Characteristics**

Luminous Diameter: 1.50 in.  
Luminous Height: 1.000 in.

**Summary of Results**

Roadway Classification: Type V, Very Short  
Cutoff Classification: Full Cutoff  
BUG Rating: B0 U0 G0

**Test Conditions**

Test Temperature: 24.7 °C  
Voltage: 12.02 VAC  
Current: 0.3498 A  
Power: 4.125 W  
Power Factor: 0.981  
Frequency: 60 Hz  
Current THD: 10.4 %

Tested in 30 planes left side, 30 planes right side, left and right averaged  
Vertical test increments are 2.5 degrees  
Test distance exceeds five times the greatest luminous opening of luminaire

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 |
|-------------|-----------|----------|---------|--------------|-----------|-------------|
| 24.7 °C     | 12.02 VAC | 0.3498 A | 4.125 W | 0.981        | 60 Hz     | 10.4 %      |

### Summary of Results

#### Spacing Criteria

0-180: 0.51  
90-270: 0.51

#### Total Lumen Output:

197.8 Lumens

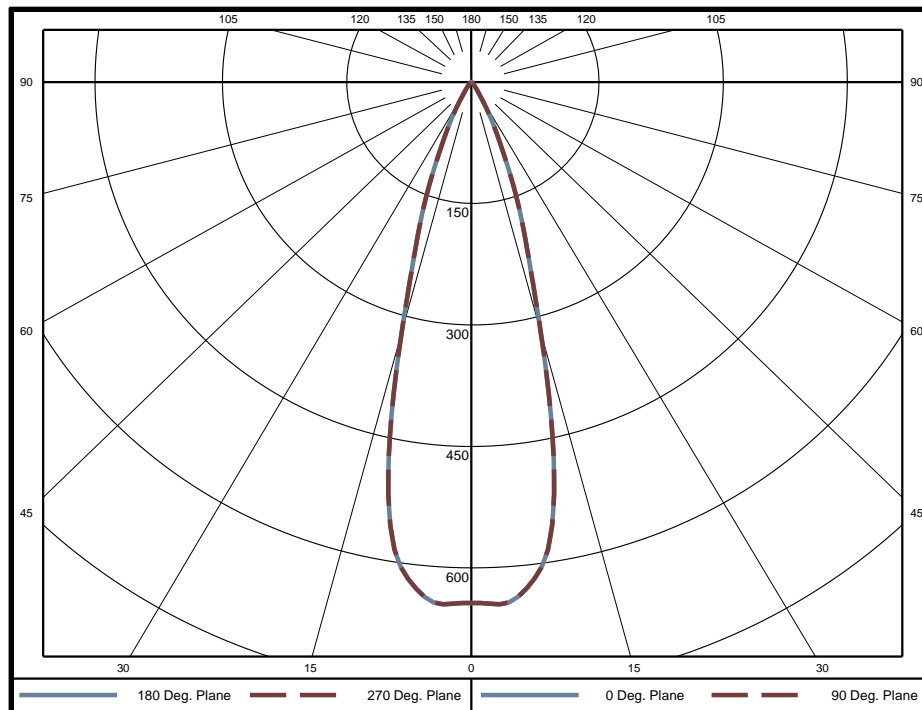
#### Luminaire Efficacy:

48.0 lm/w

#### Maximum Candela:

646 Candela

### Polar Plot



### Zonal Lumen Summary

| Zone  | Lumens | % of Luminaire | Zone    | Lumens | % of Luminaire | Zone    | Lumens | % of Luminaire |
|-------|--------|----------------|---------|--------|----------------|---------|--------|----------------|
| 0-5   | 15.39  | 7.8%           | 60-65   | 0.18   | 0.1%           | 120-125 | 0      | 0.0%           |
| 5-10  | 43.10  | 21.8%          | 65-70   | 0.06   | 0.0%           | 125-130 | 0      | 0.0%           |
| 10-15 | 51.80  | 26.2%          | 70-75   | 0.00   | 0.0%           | 130-135 | 0      | 0.0%           |
| 15-20 | 37.94  | 19.2%          | 75-80   | 0      | 0.0%           | 135-140 | 0      | 0.0%           |
| 20-25 | 24.44  | 12.4%          | 80-85   | 0      | 0.0%           | 140-145 | 0      | 0.0%           |
| 25-30 | 12.94  | 6.5%           | 85-90   | 0      | 0.0%           | 145-150 | 0      | 0.0%           |
| 30-35 | 5.46   | 2.8%           | 90-95   | 0      | 0.0%           | 150-155 | 0      | 0.0%           |
| 35-40 | 2.77   | 1.4%           | 95-100  | 0      | 0.0%           | 155-160 | 0      | 0.0%           |
| 40-45 | 1.68   | 0.8%           | 100-105 | 0      | 0.0%           | 160-165 | 0      | 0.0%           |
| 45-50 | 1.07   | 0.5%           | 105-110 | 0      | 0.0%           | 165-170 | 0      | 0.0%           |
| 50-55 | 0.65   | 0.3%           | 110-115 | 0      | 0.0%           | 170-175 | 0.00   | 0.0%           |
| 55-60 | 0.36   | 0.2%           | 115-120 | 0      | 0.0%           | 175-180 | 0.00   | 0.0%           |

| Zone   | Lumens | % of Luminaire |
|--------|--------|----------------|
| 0-40   | 194    | 98.0%          |
| 0-60   | 198    | 99.9%          |
| 0-90   | 198    | 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   | 643.4 | 643.4 | 643.4 | 643.4 | 643.4 | 643.4 | 643.4 | 643.4 | 643.4 | 643.4 | 643.4 | 643.4 | 643.4 | 643.4 | 643.4 |
|                          | 5   | 638.2 | 638.2 | 638.2 | 638.2 | 638.2 | 638.2 | 638.2 | 638.2 | 638.2 | 638.2 | 638.2 | 638.2 | 638.2 | 638.2 | 638.2 |
|                          | 10  | 555.6 | 555.6 | 555.6 | 555.6 | 555.6 | 555.6 | 555.6 | 555.6 | 555.6 | 555.6 | 555.6 | 555.6 | 555.6 | 555.6 | 555.6 |
|                          | 15  | 320.3 | 320.3 | 320.3 | 320.3 | 320.3 | 320.3 | 320.3 | 320.3 | 320.3 | 320.3 | 320.3 | 320.3 | 320.3 | 320.3 | 320.3 |
|                          | 20  | 168.5 | 168.5 | 168.5 | 168.5 | 168.5 | 168.5 | 168.5 | 168.5 | 168.5 | 168.5 | 168.5 | 168.5 | 168.5 | 168.5 | 168.5 |
|                          | 25  | 76.3  | 76.3  | 76.3  | 76.3  | 76.3  | 76.3  | 76.3  | 76.3  | 76.3  | 76.3  | 76.3  | 76.3  | 76.3  | 76.3  | 76.3  |
|                          | 30  | 30.5  | 30.5  | 30.5  | 30.5  | 30.5  | 30.5  | 30.5  | 30.5  | 30.5  | 30.5  | 30.5  | 30.5  | 30.5  | 30.5  | 30.5  |
|                          | 35  | 11.6  | 11.6  | 11.6  | 11.6  | 11.6  | 11.6  | 11.6  | 11.6  | 11.6  | 11.6  | 11.6  | 11.6  | 11.6  | 11.6  | 11.6  |
|                          | 40  | 5.9   | 5.9   | 5.9   | 5.9   | 5.9   | 5.9   | 5.9   | 5.9   | 5.9   | 5.9   | 5.9   | 5.9   | 5.9   | 5.9   | 5.9   |
|                          | 45  | 3.4   | 3.4   | 3.4   | 3.4   | 3.4   | 3.4   | 3.4   | 3.4   | 3.4   | 3.4   | 3.4   | 3.4   | 3.4   | 3.4   | 3.4   |
|                          | 50  | 2.0   | 2.0   | 2.0   | 2.0   | 2.0   | 2.0   | 2.0   | 2.0   | 2.0   | 2.0   | 2.0   | 2.0   | 2.0   | 2.0   | 2.0   |
|                          | 55  | 1.1   | 1.1   | 1.1   | 1.1   | 1.1   | 1.1   | 1.1   | 1.1   | 1.1   | 1.1   | 1.1   | 1.1   | 1.1   | 1.1   | 1.1   |
|                          | 60  | 0.5   | 0.5   | 0.5   | 0.5   | 0.5   | 0.5   | 0.5   | 0.5   | 0.5   | 0.5   | 0.5   | 0.5   | 0.5   | 0.5   | 0.5   |
|                          | 65  | 0.2   | 0.2   | 0.2   | 0.2   | 0.2   | 0.2   | 0.2   | 0.2   | 0.2   | 0.2   | 0.2   | 0.2   | 0.2   | 0.2   | 0.2   |
|                          | 70  | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
|                          | 75  | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
|                          | 80  | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
|                          | 85  | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
|                          | 90  | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
|                          | 95  | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 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   | 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   | 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   | 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   | 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   | 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   | 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   | 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   | 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   | 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   | 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   | 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   | 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   | 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   | 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   | 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   | 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   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |

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

Horizontal Angle (Degrees)

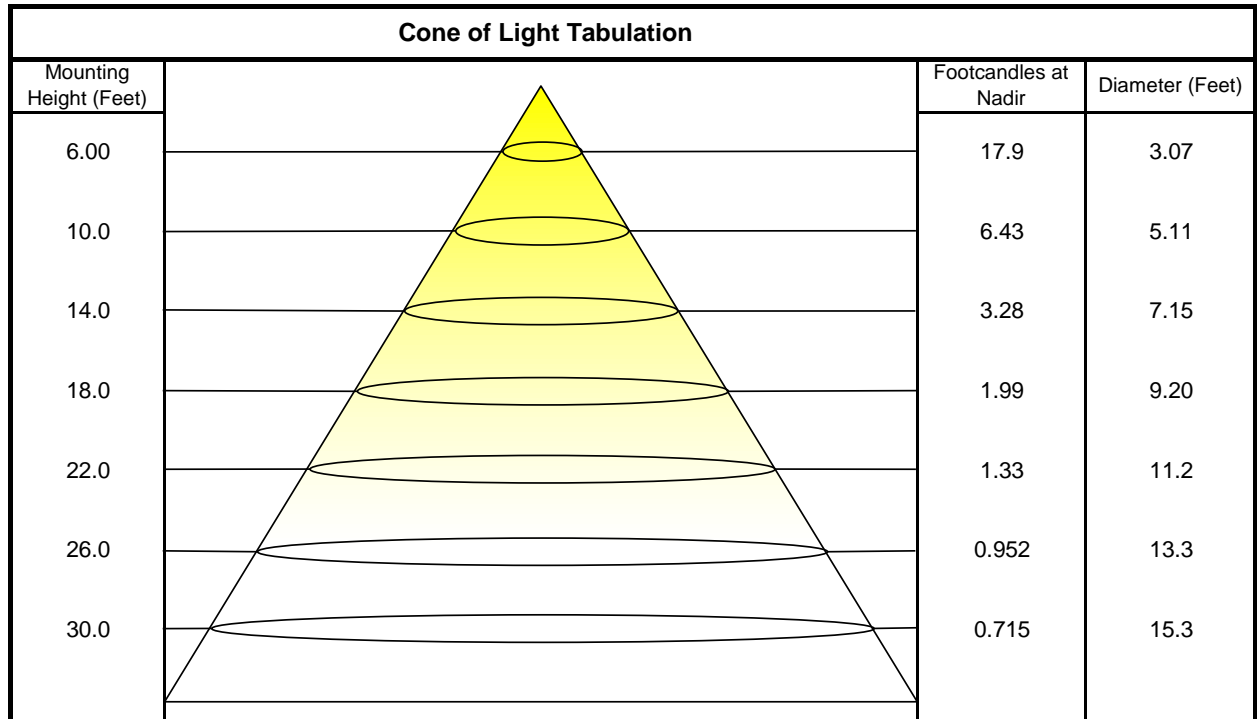
| Vertical Angle (Degrees) | 0  | 45     | 90     |
|--------------------------|----|--------|--------|
|                          | 0  | 564300 | 564300 |
|                          | 45 | 4263   | 4263   |
|                          | 55 | 1665   | 1665   |
|                          | 65 | 477    | 477    |
|                          | 75 | 0      | 0      |
|                          | 85 | 0      | 0      |



### 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                                      | 236  | 236 | 236 | 236 | 230 | 230 | 230 | 230 | 220 | 220 | 220 | 210 | 210 | 210 | 202 | 202 | 202 | 198 |
| 1                                      | 227  | 223 | 219 | 215 | 222 | 219 | 215 | 212 | 211 | 208 | 205 | 203 | 201 | 199 | 197 | 195 | 194 | 190 |
| 2                                      | 219  | 212 | 206 | 200 | 215 | 208 | 203 | 198 | 202 | 198 | 194 | 197 | 193 | 190 | 191 | 188 | 186 | 183 |
| 3                                      | 212  | 202 | 195 | 189 | 208 | 199 | 193 | 187 | 195 | 189 | 184 | 190 | 185 | 181 | 186 | 182 | 179 | 176 |
| 4                                      | 205  | 193 | 185 | 179 | 201 | 191 | 184 | 178 | 187 | 181 | 176 | 184 | 178 | 174 | 180 | 176 | 172 | 170 |
| 5                                      | 198  | 186 | 177 | 171 | 195 | 184 | 176 | 170 | 181 | 174 | 169 | 178 | 172 | 167 | 175 | 170 | 166 | 164 |
| 6                                      | 192  | 179 | 170 | 164 | 189 | 177 | 169 | 163 | 175 | 167 | 162 | 172 | 166 | 161 | 170 | 164 | 160 | 158 |
| 7                                      | 186  | 172 | 164 | 157 | 184 | 171 | 163 | 157 | 169 | 162 | 156 | 167 | 160 | 155 | 165 | 159 | 155 | 153 |
| 8                                      | 180  | 166 | 158 | 152 | 178 | 165 | 157 | 151 | 163 | 156 | 151 | 162 | 155 | 150 | 160 | 154 | 150 | 148 |
| 9                                      | 175  | 161 | 152 | 147 | 173 | 160 | 152 | 146 | 158 | 151 | 146 | 157 | 150 | 145 | 156 | 150 | 145 | 143 |
| 10                                     | 170  | 156 | 147 | 142 | 168 | 155 | 147 | 142 | 154 | 146 | 141 | 152 | 146 | 141 | 151 | 145 | 141 | 139 |

| Beam and Field Information |               |
|----------------------------|---------------|
| CIE Type:                  | Direct        |
| Center Beam Intensity:     | 643.4 Candela |
| Central Cone Intensity:    | 644 Candela   |
| Beam Flux:                 | 109.8 Lumens  |
| Beam Angle (0-180):        | 29.9 Degrees  |
| Beam Angle (90-270):       | 29.9 Degrees  |
| Field Angle (0-180):       | 52.2 Degrees  |
| Field Angle (90-270):      | 52.2 Degrees  |





**IES "BUG" Rating**  
(Back Light, Uplight, Glare)  
Per IES TM-15-11



Luminaire Classification System (LCS)

| LCS               | Zone            | Lumens | Luminaire % |
|-------------------|-----------------|--------|-------------|
| FL                | (0-30)          | 92.8   | 47.1%       |
| FM                | (30-60)         | 5.8    | 2.9%        |
| FH                | (60-80)         | 0.0    | 0.0%        |
| FVH               | (80-90)         | 0.0    | 0.0%        |
| BL                | (0-30)          | 92.8   | 47.1%       |
| BM                | (30-60)         | 5.8    | 2.9%        |
| BH                | (60-80)         | 0.0    | 0.0%        |
| BVH               | (80-90)         | 0.0    | 0.0%        |
| UL                | (90-100)        | 0.0    | 0.0%        |
| UH                | (100-180)       | 0.0    | 0.0%        |
| Total             |                 | 197.2  | 100.0%      |
| <b>BUG Rating</b> | <b>B0 U0 G0</b> |        |             |