



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, UL 1598-2008
CIE 13.3-1995, CIE 15-2004, ANSI C78.377-2015
IES TM-30-2015

Prepared For
TechBrite LLC
1000 Kieley Pl
Cincinnati, OH 45217
United States

Catalog Number
LT224SS1B30BC000,RT224SS1B30BC000
Order Number
11748594
Test Number
11748594.19

Test Date

2017-05-06 - 2017-05-09

Prepared By

Alexa Lambert, Project Handler

Approved By

Tiffany Hamm, Project Handler

The results contained in this report pertain only to the tested sample.
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Table of Contents

| | |
|---|--------|
| Summary of Results | Page 3 |
| Integrating Sphere Results | Page 4 |
| Distribution Results | |
| Conditions / Summary of Results / Polar Plot / Zonal Lumens | Page 5 |
| Candela Tabulation / Average Luminance | Page 6 |
| Coefficients of Utilization / Cone of Light | Page 7 |
| ISOFootcandle Plot | Page 8 |
| In-Situ Results | Page 9 |

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 4π geometry method.
Absorption correction was employed for Sphere measurement



Luminaire Description: White steel housing, prismatic lens enclosure. Tested in an A.L.P EL 2x2 housing.
Lamp: 112 white LEDs
Mounting: Surface – Ceiling
Ballast/Driver: Everline D700CC30UNVTZ-C

Luminaire



Luminaire Characteristics

Luminous Length: 21.00 in.
Luminous Width: 21.00 in.

Summary of Results

Integrating Sphere

Luminous Flux: 2890 Lumens
Efficacy: 108.2 lm/w
CCT: 3086 K
CRI (Ra): 82.7

Distribution

Total Luminaire Output: 2836 Lumens
Luminaire Efficacy: 105.9 lm/w
Maximum Candela: 1254 Candela

Electrical Data at 277 VAC

Test Temperature: 25.2 °C
Voltage: 277.0 VAC
Current: 0.1021 A
Power: 27.40 W
Power Factor: 0.968
Frequency: 60 Hz
Current THD: 11.0 %

In-Situ

LED Temperature: 38.7 °C
Driver Temperature: 43.4 °C
Measured LED Current: 0.06970 A

Temperature is offset to an ambient temperature of 25°C as described in UL1598-2008.



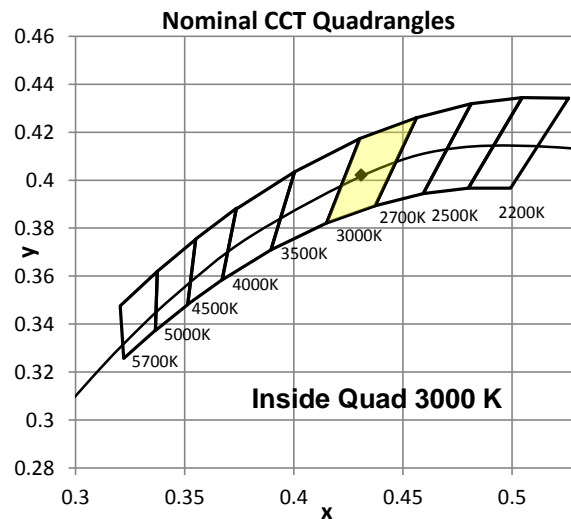
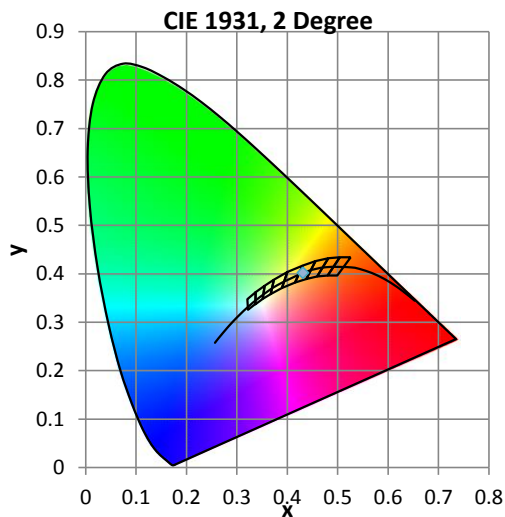
Color Quality - Integrating Sphere

Integrating Sphere Test Conditions

| Temperature | Voltage | Current | Power | Power Factor | Frequency | Current THD |
|-------------|-----------|----------|---------|--------------|-----------|-------------|
| 25.7 °C | 120.0 VAC | 0.2235 A | 26.71 W | 0.996 | 60 Hz | 8.31 % |

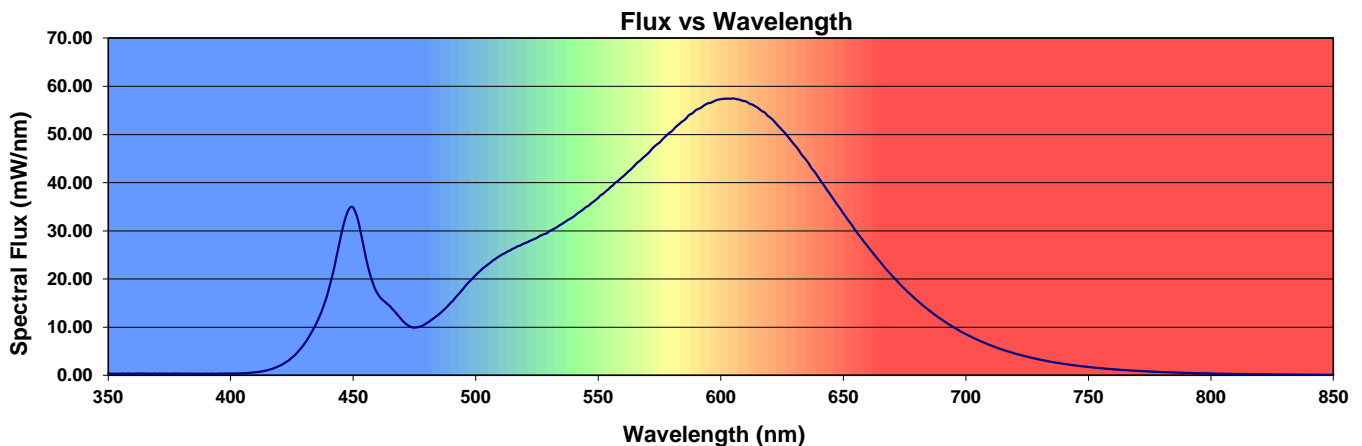
Summary of Results

| | | | |
|-----------------------------|-------------|---------------------------|--------|
| Total Output: | 2890 Lumens | Chromaticity (x): | 0.4309 |
| Efficacy: | 108.2 lm/w | Chromaticity (y): | 0.4022 |
| CCT: | 3086 K | Chromaticity (u'): | 0.2475 |
| CRI (Ra): | 82.7 | Chromaticity (v'): | 0.5197 |
| CRI (R9): | 7.9 | TM-30 Rf: | 83.1 |
| Peak Wavelength: | 604.2 nm | TM-30 Rg: | 97 |
| Dominant Wavelength: | 582.4 nm | Duv: | 0.0005 |
| S/P Ratio: | 1.371 | | |



Color Rendering Index Detail

| Ra (CRI) | R1 | R2 | R3 | R4 | R5 | R6 | R7 | R8 | R9 | R10 | R11 | R12 | R13 | R14 |
|----------|------|------|------|------|------|------|------|------|-----|------|------|------|------|------|
| 82.7 | 80.8 | 90.2 | 96.8 | 81.2 | 81.2 | 88.0 | 83.6 | 60.1 | 7.9 | 77.9 | 80.6 | 72.2 | 82.9 | 98.6 |





Distribution - Goniophotometer

Distribution Test Conditions

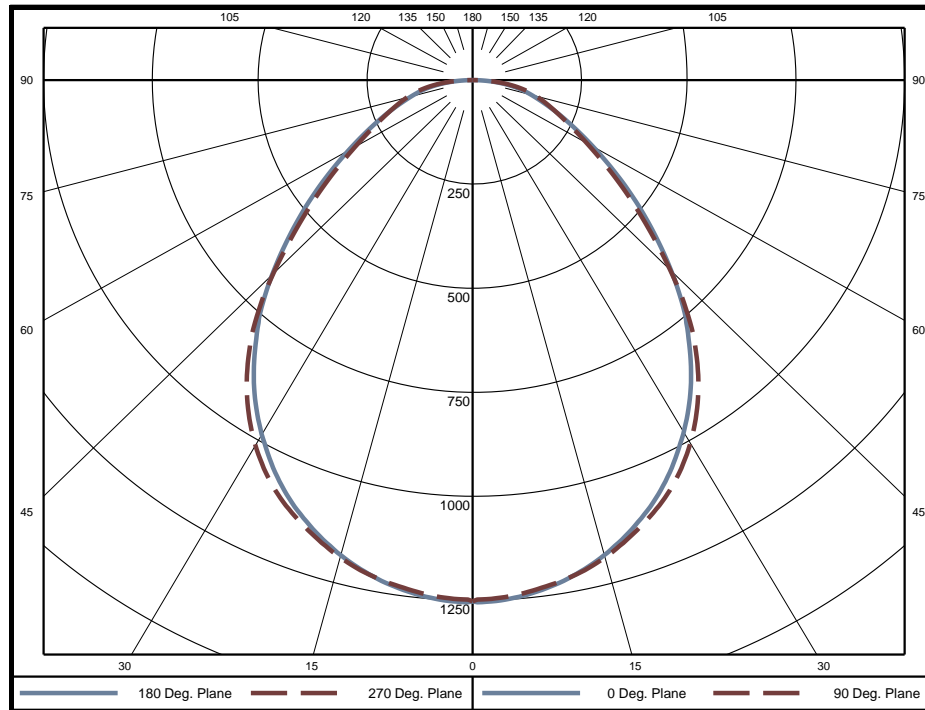
| Temperature | Voltage | Current | Power | Power Factor | Frequency | Current THD |
|-------------|-----------|----------|---------|--------------|-----------|-------------|
| 25.0 °C | 119.9 VAC | 0.2241 A | 26.77 W | 0.996 | 60 Hz | 8.21 % |

Summary of Results

Spacing Criteria
 0-180: 1.17
 90-270: 1.17

Total Lumen Output: 2836 Lumens
Luminaire Efficacy: 105.9 lm/w
Maximum Candela: 1254 Candela

Polar Plot



Zonal Lumen Summary

| Zone | Lumens | % of Luminaire | Zone | Lumens | % of Luminaire | Zone | Lumens | % of Luminaire |
|-------|--------|----------------|---------|--------|----------------|---------|--------|----------------|
| 0-5 | 29.8 | 1.1% | 60-65 | 134.2 | 4.7% | 120-125 | 0 | 0.0% |
| 5-10 | 88.1 | 3.1% | 65-70 | 107.4 | 3.8% | 125-130 | 0 | 0.0% |
| 10-15 | 142.6 | 5.0% | 70-75 | 86.5 | 3.1% | 130-135 | 0 | 0.0% |
| 15-20 | 191.0 | 6.7% | 75-80 | 66.9 | 2.4% | 135-140 | 0 | 0.0% |
| 20-25 | 231.2 | 8.2% | 80-85 | 44.0 | 1.6% | 140-145 | 0 | 0.0% |
| 25-30 | 261.0 | 9.2% | 85-90 | 17.0 | 0.6% | 145-150 | 0 | 0.0% |
| 30-35 | 277.8 | 9.8% | 90-95 | 0 | 0.0% | 150-155 | 0 | 0.0% |
| 35-40 | 280.0 | 9.9% | 95-100 | 0 | 0.0% | 155-160 | 0 | 0.0% |
| 40-45 | 267.2 | 9.4% | 100-105 | 0 | 0.0% | 160-165 | 0 | 0.0% |
| 45-50 | 239.7 | 8.5% | 105-110 | 0 | 0.0% | 165-170 | 0 | 0.0% |
| 50-55 | 204.4 | 7.2% | 110-115 | 0 | 0.0% | 170-175 | 0 | 0.0% |
| 55-60 | 167.4 | 5.9% | 115-120 | 0 | 0.0% | 175-180 | 0 | 0.0% |

| Zone | Lumens | % of Luminaire |
|--------|--------|----------------|
| 0-40 | 1502 | 52.9% |
| 0-60 | 2380 | 83.9% |
| 0-90 | 2836 | 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 | 1252 | 1252 | 1252 | 1252 | 1252 | 1252 | 1252 | 1252 | 1252 | 1252 | 1252 | 1252 | 1252 | 1252 | 1252 | 1252 |
| | 5 | 1246 | 1245 | 1244 | 1241 | 1240 | 1241 | 1244 | 1245 | 1246 | 1245 | 1244 | 1241 | 1240 | 1241 | 1244 | 1245 |
| | 10 | 1222 | 1220 | 1220 | 1220 | 1219 | 1220 | 1220 | 1220 | 1222 | 1220 | 1220 | 1220 | 1219 | 1220 | 1220 | 1220 |
| | 15 | 1182 | 1180 | 1184 | 1187 | 1187 | 1187 | 1184 | 1180 | 1182 | 1180 | 1184 | 1187 | 1187 | 1187 | 1184 | 1180 |
| | 20 | 1129 | 1127 | 1133 | 1139 | 1141 | 1139 | 1133 | 1127 | 1129 | 1127 | 1133 | 1139 | 1141 | 1139 | 1133 | 1127 |
| | 25 | 1064 | 1061 | 1067 | 1079 | 1086 | 1079 | 1067 | 1061 | 1064 | 1061 | 1067 | 1079 | 1086 | 1079 | 1067 | 1061 |
| | 30 | 982 | 979 | 987 | 1002 | 1011 | 1002 | 987 | 979 | 982 | 979 | 987 | 1002 | 1011 | 1002 | 987 | 979 |
| | 35 | 887 | 883 | 891 | 904 | 915 | 904 | 891 | 883 | 887 | 883 | 891 | 904 | 915 | 904 | 891 | 883 |
| | 40 | 779 | 776 | 781 | 790 | 798 | 790 | 781 | 776 | 779 | 776 | 781 | 790 | 798 | 790 | 781 | 776 |
| | 45 | 659 | 661 | 663 | 656 | 653 | 656 | 663 | 661 | 659 | 661 | 663 | 656 | 653 | 656 | 663 | 661 |
| | 50 | 537 | 540 | 536 | 519 | 516 | 519 | 536 | 540 | 537 | 540 | 536 | 519 | 516 | 519 | 536 | 540 |
| | 55 | 426 | 423 | 414 | 403 | 402 | 403 | 414 | 423 | 426 | 423 | 414 | 403 | 402 | 403 | 414 | 423 |
| | 60 | 329 | 323 | 312 | 308 | 310 | 308 | 312 | 323 | 329 | 323 | 312 | 308 | 310 | 308 | 312 | 323 |
| | 65 | 253 | 244 | 231 | 239 | 244 | 239 | 231 | 244 | 253 | 244 | 231 | 239 | 244 | 239 | 231 | 244 |
| | 70 | 193 | 186 | 177 | 190 | 195 | 190 | 177 | 186 | 193 | 186 | 177 | 190 | 195 | 190 | 177 | 186 |
| | 75 | 145 | 141 | 137 | 149 | 156 | 149 | 137 | 141 | 145 | 141 | 137 | 149 | 156 | 149 | 137 | 141 |
| 80 | 104 | 99 | 101 | 108 | 114 | 108 | 101 | 99 | 104 | 99 | 101 | 108 | 114 | 108 | 101 | 99 | |
| 85 | 53 | 51 | 54 | 60 | 61 | 60 | 54 | 51 | 53 | 51 | 54 | 60 | 61 | 60 | 54 | 51 | |
| 90 | 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 | |
| 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)

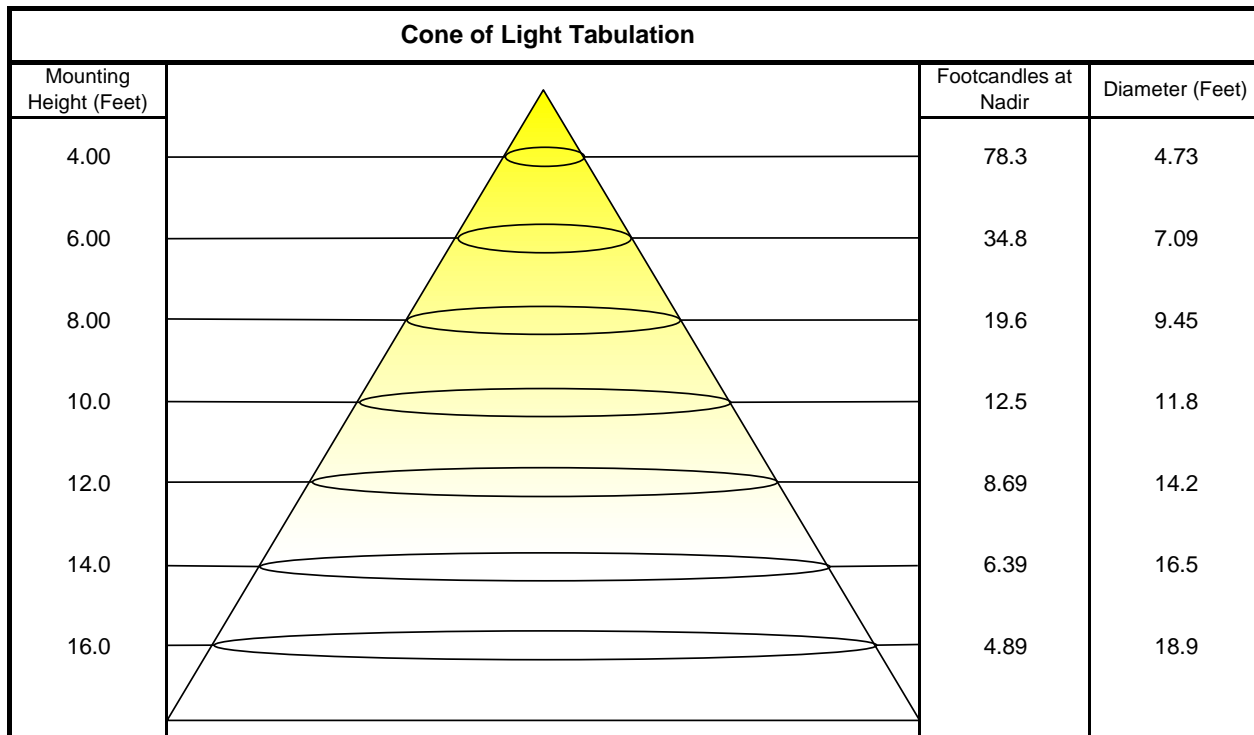
| Vertical Angle (Degrees) | 0 | 45 | 90 | |
|--------------------------|----|------|------|------|
| | 0 | 4401 | 4401 | 4401 |
| | 45 | 3274 | 3298 | 3248 |
| | 55 | 2608 | 2534 | 2462 |
| | 65 | 2102 | 1923 | 2028 |
| | 75 | 1972 | 1861 | 2121 |
| | 85 | 2136 | 2188 | 2475 |



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 | 3377 | 3377 | 3377 | 3377 | 3298 | 3298 | 3298 | 3298 | 3151 | 3151 | 3151 | 3017 | 3017 | 3017 | 2894 | 2894 | 2894 | 2836 |
| 1 | 3105 | 2978 | 2864 | 2761 | 3028 | 2914 | 2810 | 2716 | 2794 | 2708 | 2630 | 2683 | 2614 | 2550 | 2582 | 2526 | 2475 | 2416 |
| 2 | 2848 | 2629 | 2449 | 2297 | 2775 | 2576 | 2411 | 2270 | 2477 | 2338 | 2217 | 2385 | 2269 | 2167 | 2301 | 2205 | 2119 | 2060 |
| 3 | 2617 | 2337 | 2120 | 1948 | 2548 | 2293 | 2092 | 1931 | 2210 | 2038 | 1897 | 2133 | 1987 | 1864 | 2062 | 1938 | 1833 | 1774 |
| 4 | 2412 | 2092 | 1858 | 1679 | 2349 | 2055 | 1837 | 1668 | 1986 | 1796 | 1645 | 1921 | 1757 | 1624 | 1861 | 1719 | 1602 | 1544 |
| 5 | 2230 | 1886 | 1645 | 1468 | 2173 | 1855 | 1629 | 1460 | 1796 | 1597 | 1444 | 1741 | 1566 | 1429 | 1690 | 1537 | 1414 | 1357 |
| 6 | 2069 | 1711 | 1470 | 1297 | 2017 | 1684 | 1457 | 1292 | 1634 | 1432 | 1281 | 1588 | 1408 | 1270 | 1544 | 1384 | 1259 | 1203 |
| 7 | 1926 | 1561 | 1324 | 1158 | 1878 | 1538 | 1313 | 1154 | 1495 | 1293 | 1146 | 1455 | 1273 | 1138 | 1418 | 1255 | 1130 | 1076 |
| 8 | 1798 | 1431 | 1201 | 1042 | 1755 | 1412 | 1192 | 1039 | 1375 | 1176 | 1033 | 1341 | 1160 | 1027 | 1309 | 1144 | 1021 | 969 |
| 9 | 1684 | 1319 | 1096 | 945 | 1645 | 1303 | 1089 | 943 | 1271 | 1075 | 938 | 1241 | 1062 | 933 | 1213 | 1049 | 929 | 879 |
| 10 | 1583 | 1222 | 1006 | 862 | 1547 | 1207 | 1000 | 860 | 1180 | 989 | 857 | 1154 | 978 | 853 | 1129 | 967 | 850 | 802 |

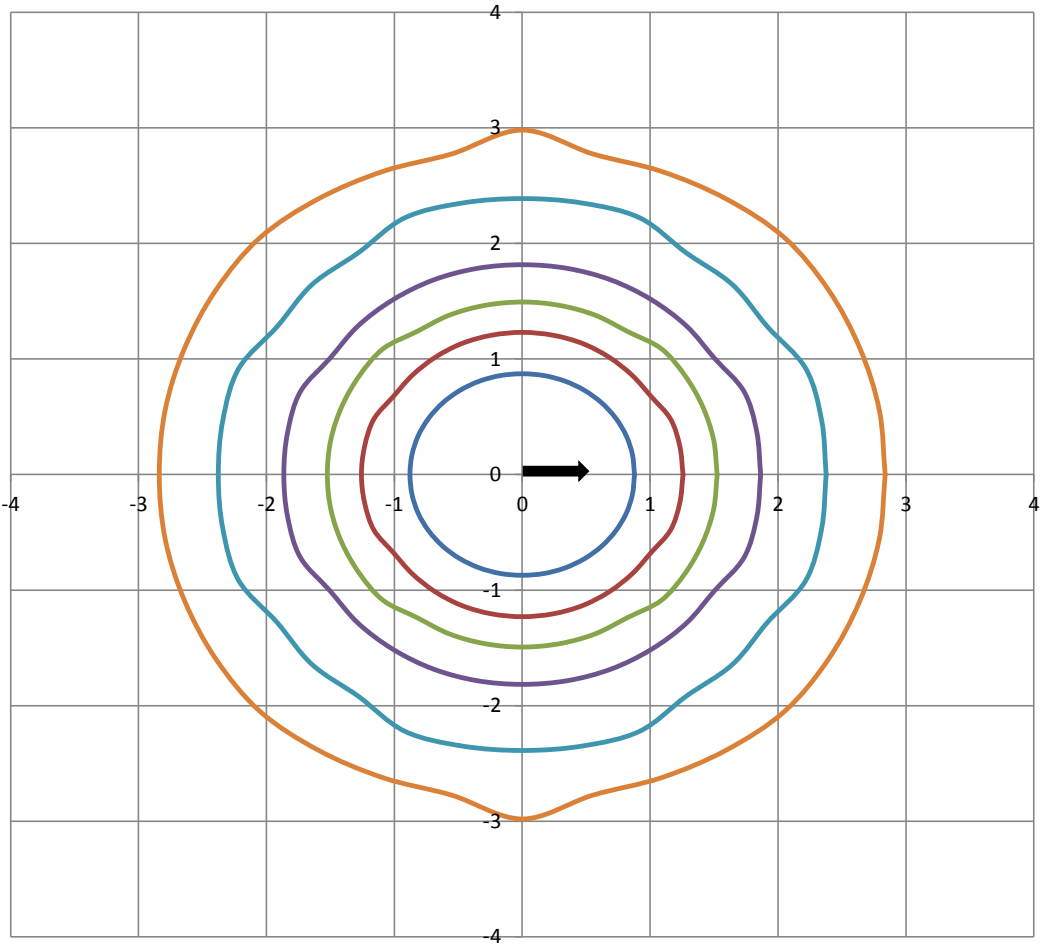
| Beam and Field Information | |
|----------------------------|---------------|
| CIE Type: | Direct |
| Center Beam Intensity: | 1252 Candela |
| Central Cone Intensity: | 1249 Candela |
| Beam Flux: | 1833.5 Lumens |
| Beam Angle (0-180): | 92.6 Degrees |
| Beam Angle (90-270): | 91.8 Degrees |
| Field Angle (0-180): | 155.0 Degrees |
| Field Angle (90-270): | 157.5 Degrees |





ISOFootcandle Plot

Mounting Height - 8 Feet



Grid Lines in Units of Mounting Height





In-Situ Test

In-Situ Test Conditions

| Temperature | Voltage | Current | Power | Power Factor | Frequency | Current THD |
|-------------|-----------|---------|-------|--------------|-----------|-------------|
| 24.8 °C | 120.1 VAC | N/A | N/A | N/A | 60 Hz | N/A |

Summary of Results

LED Temperature: 38.7 °C
Driver Temperature: 43.4 °C
Measured LED Current: 0.06970 A

Temperatures are offset to an ambient temperature of 25°C as described in UL1598-2008

LED Temperature Location



Driver Temperature Location

