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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
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Cincinnati, OH 45217
United States

Catalog Number
LT224SS1B30DC000,RT224SS1B30DC000
Order Number
11748594
Test Number
11748594.13

Test Date

2017-05-03 - 2017-05-08

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Approved By

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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 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: Recessed
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: 3555 Lumens
Efficacy: 106.3 lm/w
CCT: 3091 K
CRI (Ra): 82.7

Distribution

Total Luminaire Output: 3466 Lumens
Luminaire Efficacy: 103.5 lm/w
Maximum Candela: 1535 Candela

Electrical Data at 277 VAC

Test Temperature: 24.3 °C
Voltage: 277.1 VAC
Current: 0.1259 A
Power: 33.99 W
Power Factor: 0.975
Frequency: 60 Hz
Current THD: 10.7 %

In-Situ

LED Temperature: 47.6 °C
Driver Temperature: 41.1 °C
Measured LED Current: 0.08740 A

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



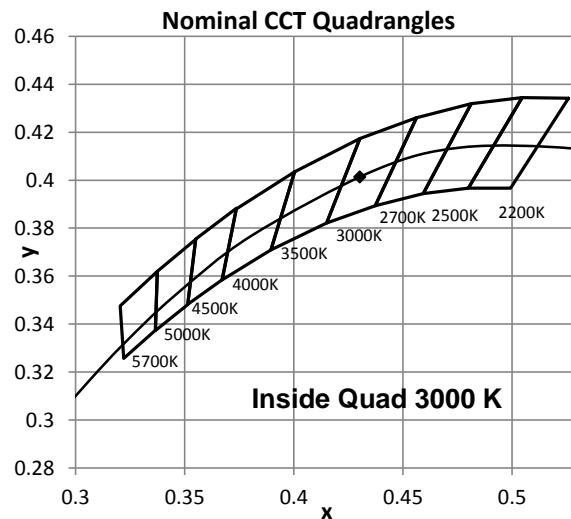
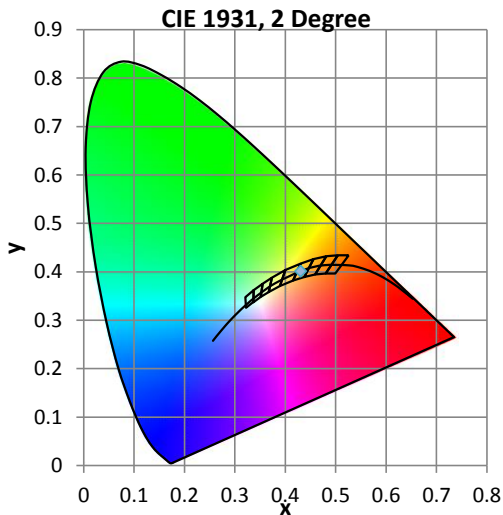
Color Quality - Integrating Sphere

Integrating Sphere Test Conditions

| Temperature | Voltage | Current | Power | Power Factor | Frequency | Current THD |
|-------------|-----------|----------|---------|--------------|-----------|-------------|
| 25.2 °C | 120.0 VAC | 0.2798 A | 33.46 W | 0.997 | 60 Hz | 7.26 % |

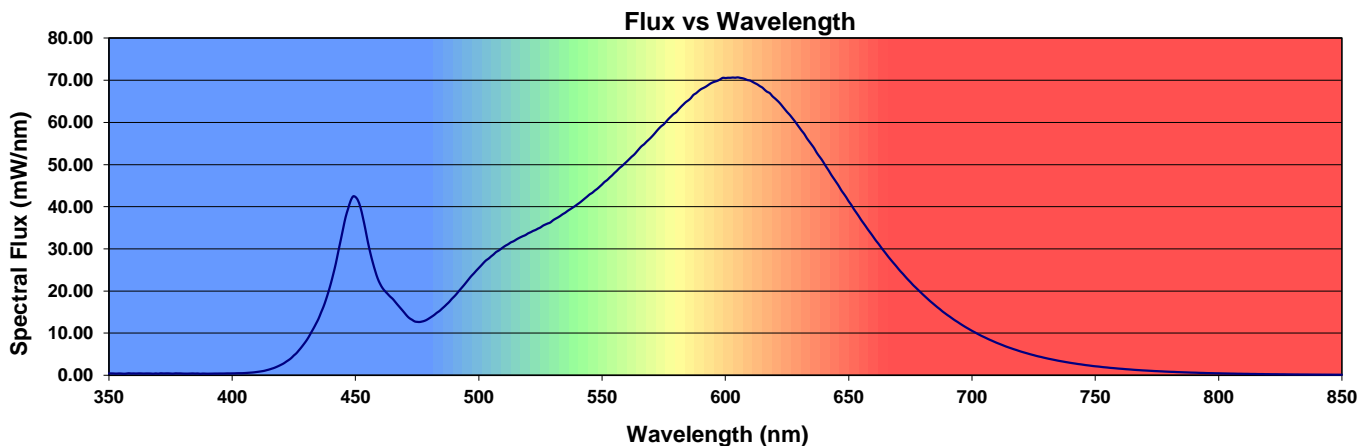
Summary of Results

| | | | |
|-----------------------------|-------------|---------------------------|--------|
| Total Output: | 3555 Lumens | Chromaticity (x): | 0.4303 |
| Efficacy: | 106.3 lm/w | Chromaticity (y): | 0.4014 |
| CCT: | 3091 K | Chromaticity (u'): | 0.2474 |
| CRI (Ra): | 82.7 | Chromaticity (v'): | 0.5193 |
| CRI (R9): | 7.9 | TM-30 Rf: | 83.1 |
| Peak Wavelength: | 604.1 nm | TM-30 Rg: | 96.9 |
| Dominant Wavelength: | 582.5 nm | Duv: | 0.0007 |
| S/P Ratio: | 1.375 | | |



Color Rendering Index Detail

| Ra (CRI) | R1 | R2 | R3 | R4 | R5 | R6 | R7 | R8 | R9 | R10 | R11 | R12 | R13 | R14 |
|----------|------|------|------|------|------|------|------|------|-----|------|------|------|------|------|
| 82.7 | 80.8 | 90.3 | 96.7 | 81.1 | 81.2 | 88.1 | 83.4 | 60.0 | 7.9 | 78.1 | 80.4 | 72.3 | 82.9 | 98.6 |





Distribution - Goniophotometer

Distribution Test Conditions

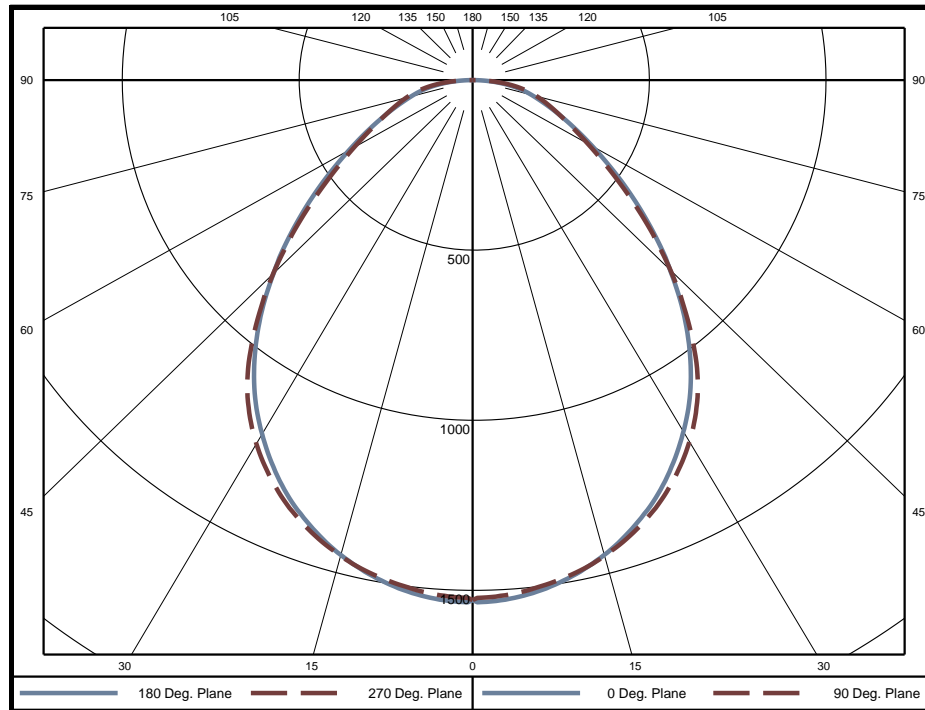
| Temperature | Voltage | Current | Power | Power Factor | Frequency | Current THD |
|-------------|-----------|----------|---------|--------------|-----------|-------------|
| 25.2 °C | 119.9 VAC | 0.2802 A | 33.50 W | 0.997 | 60 Hz | 7.21 % |

Summary of Results

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

Total Lumen Output: 3466 Lumens
Luminaire Efficacy: 103.5 lm/w
Maximum Candela: 1535 Candela

Polar Plot



Zonal Lumen Summary

| Zone | Lumens | % of Luminaire | Zone | Lumens | % of Luminaire | Zone | Lumens | % of Luminaire |
|-------|--------|----------------|---------|--------|----------------|---------|--------|----------------|
| 0-5 | 36.4 | 1.1% | 60-65 | 164.9 | 4.8% | 120-125 | 0 | 0.0% |
| 5-10 | 107.5 | 3.1% | 65-70 | 132.3 | 3.8% | 125-130 | 0 | 0.0% |
| 10-15 | 174.0 | 5.0% | 70-75 | 105.9 | 3.1% | 130-135 | 0 | 0.0% |
| 15-20 | 233.1 | 6.7% | 75-80 | 82.7 | 2.4% | 135-140 | 0 | 0.0% |
| 20-25 | 282.2 | 8.1% | 80-85 | 54.3 | 1.6% | 140-145 | 0 | 0.0% |
| 25-30 | 318.4 | 9.2% | 85-90 | 20.9 | 0.6% | 145-150 | 0 | 0.0% |
| 30-35 | 339.2 | 9.8% | 90-95 | 0 | 0.0% | 150-155 | 0 | 0.0% |
| 35-40 | 341.4 | 9.8% | 95-100 | 0 | 0.0% | 155-160 | 0 | 0.0% |
| 40-45 | 324.4 | 9.4% | 100-105 | 0 | 0.0% | 160-165 | 0 | 0.0% |
| 45-50 | 292.8 | 8.4% | 105-110 | 0 | 0.0% | 165-170 | 0 | 0.0% |
| 50-55 | 250.6 | 7.2% | 110-115 | 0 | 0.0% | 170-175 | 0 | 0.0% |
| 55-60 | 205.3 | 5.9% | 115-120 | 0 | 0.0% | 175-180 | 0 | 0.0% |

| Zone | Lumens | % of Luminaire |
|--------|--------|----------------|
| 0-40 | 1832 | 52.9% |
| 0-60 | 2905 | 83.8% |
| 0-90 | 3466 | 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 | 1529 | 1529 | 1529 | 1529 | 1529 | 1529 | 1529 | 1529 | 1529 | 1529 | 1529 | 1529 | 1529 | 1529 | 1529 | 1529 |
| 5 | 1525 | 1519 | 1520 | 1515 | 1512 | 1515 | 1520 | 1519 | 1525 | 1519 | 1520 | 1515 | 1512 | 1515 | 1520 | 1519 |
| 10 | 1494 | 1488 | 1489 | 1487 | 1486 | 1487 | 1489 | 1488 | 1494 | 1488 | 1489 | 1487 | 1486 | 1487 | 1489 | 1488 |
| 15 | 1446 | 1439 | 1445 | 1448 | 1449 | 1448 | 1445 | 1439 | 1446 | 1439 | 1445 | 1448 | 1449 | 1448 | 1445 | 1439 |
| 20 | 1381 | 1375 | 1384 | 1391 | 1395 | 1391 | 1384 | 1375 | 1381 | 1375 | 1384 | 1391 | 1395 | 1391 | 1384 | 1375 |
| 25 | 1300 | 1294 | 1304 | 1316 | 1322 | 1316 | 1304 | 1294 | 1300 | 1294 | 1304 | 1316 | 1322 | 1316 | 1304 | 1294 |
| 30 | 1199 | 1196 | 1204 | 1220 | 1232 | 1220 | 1204 | 1196 | 1199 | 1196 | 1204 | 1220 | 1232 | 1220 | 1204 | 1196 |
| 35 | 1085 | 1079 | 1087 | 1104 | 1117 | 1104 | 1087 | 1079 | 1085 | 1079 | 1087 | 1104 | 1117 | 1104 | 1087 | 1079 |
| 40 | 949 | 945 | 950 | 959 | 966 | 959 | 950 | 945 | 949 | 945 | 950 | 959 | 966 | 959 | 950 | 945 |
| 45 | 800 | 801 | 805 | 799 | 801 | 799 | 805 | 801 | 800 | 801 | 805 | 799 | 801 | 799 | 805 | 801 |
| 50 | 655 | 658 | 655 | 640 | 638 | 640 | 655 | 658 | 655 | 658 | 655 | 640 | 638 | 640 | 655 | 658 |
| 55 | 518 | 518 | 508 | 496 | 494 | 496 | 508 | 518 | 518 | 518 | 508 | 496 | 494 | 496 | 508 | 518 |
| 60 | 400 | 394 | 383 | 380 | 383 | 380 | 383 | 394 | 400 | 394 | 383 | 380 | 383 | 380 | 383 | 394 |
| 65 | 308 | 300 | 288 | 295 | 301 | 295 | 288 | 300 | 308 | 300 | 288 | 295 | 301 | 295 | 288 | 300 |
| 70 | 235 | 227 | 217 | 235 | 241 | 235 | 217 | 227 | 235 | 227 | 217 | 235 | 241 | 235 | 217 | 227 |
| 75 | 178 | 175 | 171 | 184 | 193 | 184 | 171 | 175 | 178 | 175 | 171 | 184 | 193 | 184 | 171 | 175 |
| 80 | 127 | 122 | 125 | 133 | 141 | 133 | 125 | 122 | 127 | 122 | 125 | 133 | 141 | 133 | 125 | 122 |
| 85 | 65 | 63 | 67 | 75 | 77 | 75 | 67 | 63 | 65 | 63 | 67 | 75 | 77 | 75 | 67 | 63 |
| 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)

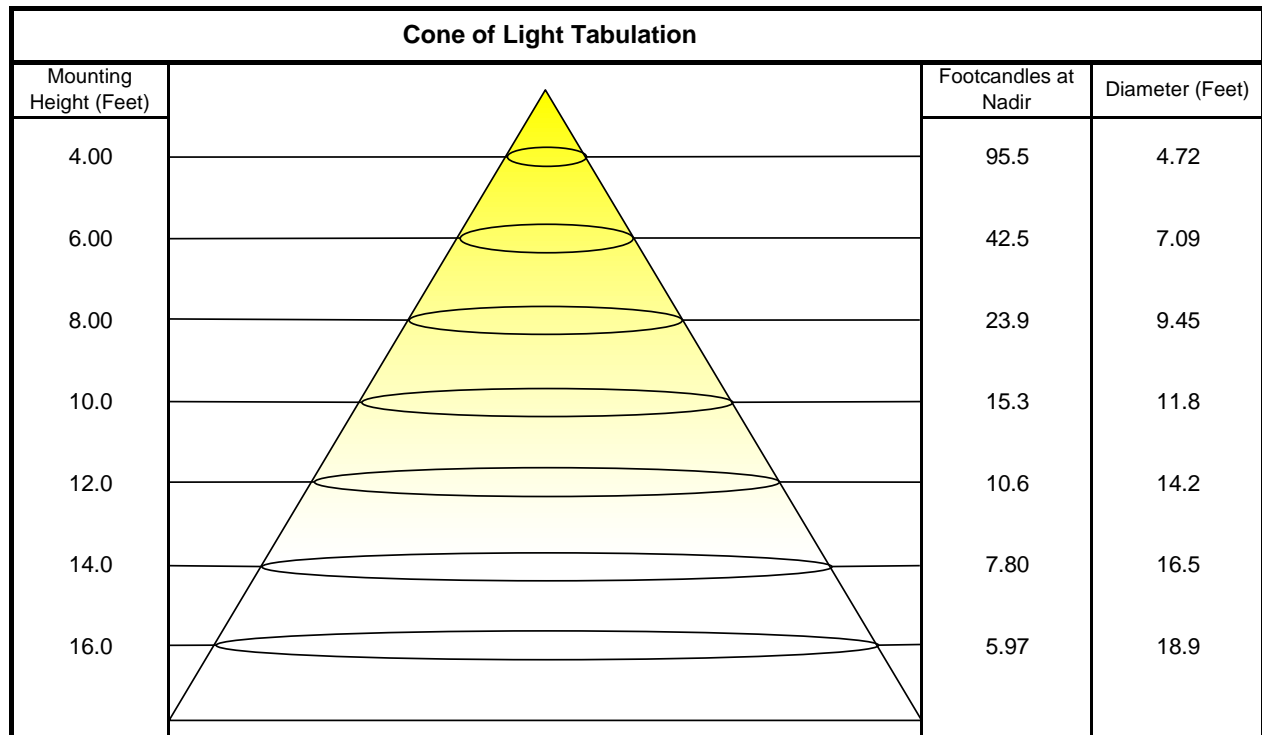
| Vertical Angle (Degrees) | Horizontal Angle (Degrees) | | |
|--------------------------|----------------------------|------|------|
| | 0 | 45 | 90 |
| 0 | 5372 | 5372 | 5372 |
| 45 | 3976 | 3999 | 3979 |
| 55 | 3174 | 3114 | 3029 |
| 65 | 2562 | 2391 | 2499 |
| 75 | 2421 | 2317 | 2618 |
| 85 | 2610 | 2716 | 3087 |



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 | 4127 | 4127 | 4127 | 4127 | 4031 | 4031 | 4031 | 4031 | 3852 | 3852 | 3852 | 3688 | 3688 | 3688 | 3537 | 3537 | 3537 | 3466 |
| 1 | 3794 | 3638 | 3499 | 3373 | 3700 | 3560 | 3433 | 3318 | 3413 | 3309 | 3213 | 3279 | 3194 | 3115 | 3155 | 3087 | 3023 | 2952 |
| 2 | 3479 | 3212 | 2991 | 2805 | 3390 | 3147 | 2944 | 2772 | 3026 | 2855 | 2708 | 2914 | 2772 | 2647 | 2810 | 2693 | 2588 | 2516 |
| 3 | 3196 | 2854 | 2589 | 2378 | 3113 | 2800 | 2555 | 2357 | 2699 | 2489 | 2316 | 2605 | 2426 | 2276 | 2518 | 2367 | 2238 | 2165 |
| 4 | 2946 | 2555 | 2269 | 2050 | 2869 | 2510 | 2243 | 2036 | 2425 | 2192 | 2009 | 2346 | 2145 | 1982 | 2272 | 2099 | 1956 | 1884 |
| 5 | 2724 | 2303 | 2009 | 1791 | 2654 | 2265 | 1989 | 1782 | 2193 | 1950 | 1763 | 2126 | 1912 | 1744 | 2064 | 1876 | 1726 | 1656 |
| 6 | 2527 | 2089 | 1795 | 1583 | 2463 | 2057 | 1779 | 1577 | 1996 | 1748 | 1563 | 1939 | 1718 | 1550 | 1885 | 1690 | 1537 | 1469 |
| 7 | 2352 | 1906 | 1616 | 1413 | 2294 | 1878 | 1603 | 1408 | 1826 | 1578 | 1398 | 1777 | 1555 | 1389 | 1731 | 1531 | 1379 | 1313 |
| 8 | 2196 | 1748 | 1466 | 1272 | 2144 | 1724 | 1455 | 1268 | 1679 | 1435 | 1261 | 1637 | 1415 | 1253 | 1598 | 1396 | 1246 | 1183 |
| 9 | 2057 | 1611 | 1338 | 1153 | 2010 | 1591 | 1329 | 1150 | 1552 | 1312 | 1144 | 1515 | 1296 | 1139 | 1481 | 1280 | 1133 | 1072 |
| 10 | 1933 | 1492 | 1228 | 1052 | 1890 | 1474 | 1221 | 1050 | 1440 | 1207 | 1045 | 1409 | 1193 | 1041 | 1379 | 1180 | 1037 | 978 |

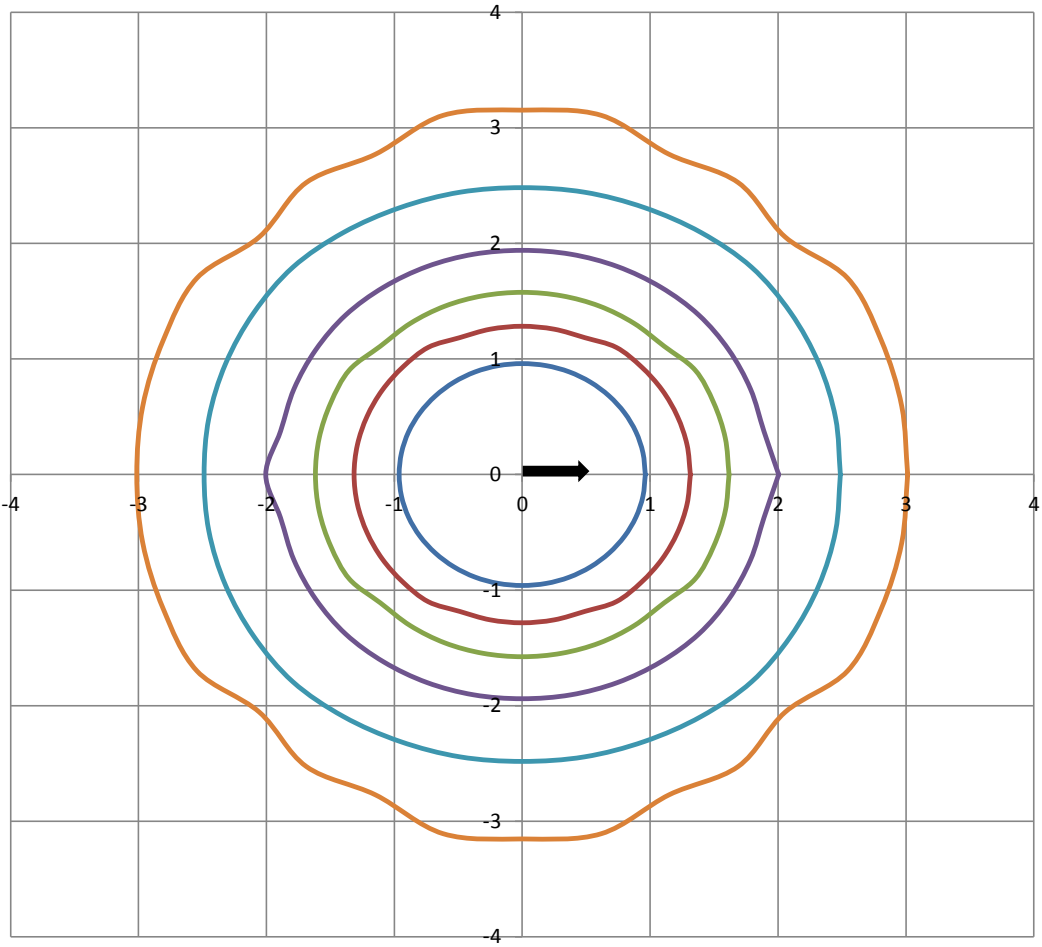
| Beam and Field Information | |
|----------------------------|---------------|
| CIE Type: | Direct |
| Center Beam Intensity: | 1529 Candela |
| Central Cone Intensity: | 1525 Candela |
| Beam Flux: | 2231.7 Lumens |
| Beam Angle (0-180): | 92.6 Degrees |
| Beam Angle (90-270): | 92.1 Degrees |
| Field Angle (0-180): | 155.2 Degrees |
| Field Angle (90-270): | 157.9 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 |
|-------------|-----------|---------|-------|--------------|-----------|-------------|
| 24.3 °C | 120.1 VAC | N/A | N/A | N/A | 60 Hz | N/A |

Summary of Results

LED Temperature: 47.6 °C
Driver Temperature: 41.1 °C
Measured LED Current: 0.08740 A

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

LED Temperature Location



Driver Temperature Location



