

Cooper Lighting Solutions Photometric Lab
1121 Highway 74 South
Peachtree City, GA 30269



Scaled data based on original data using
LM-79-2019 Approved Method: Electrical and Photometric Measurements of Solid-
State Lighting Products

Test Report Prepared for
Cooper Lighting Solutions

Brand: NEO-RAY

Report Number: P921864

Luminaire Tested: DFN2DIP-HX4F0-080D090US940-FLLFLL

Issue Date: 11/21/2024

Test Information

Test Method: LM-79-2019
Report Number: P921864
REPORT IS A COMBINATION OF REPORTS P899397 AND P896188
Test Lab: INNOVATION CENTER
Issue Date: 11/21/2024
Manufacturer: COOPER LIGHTING SOLUTIONS
Product Line: NEO-RAY
Catalog Number: DFN2DIP-HX4F0-080D090US940-FLLFLL
Description: 4 foot, Hexagon Define Geo, with Direct Frosted Lens, Indirect Frosted Lens
Light Source: -
Ballast/Driver: -

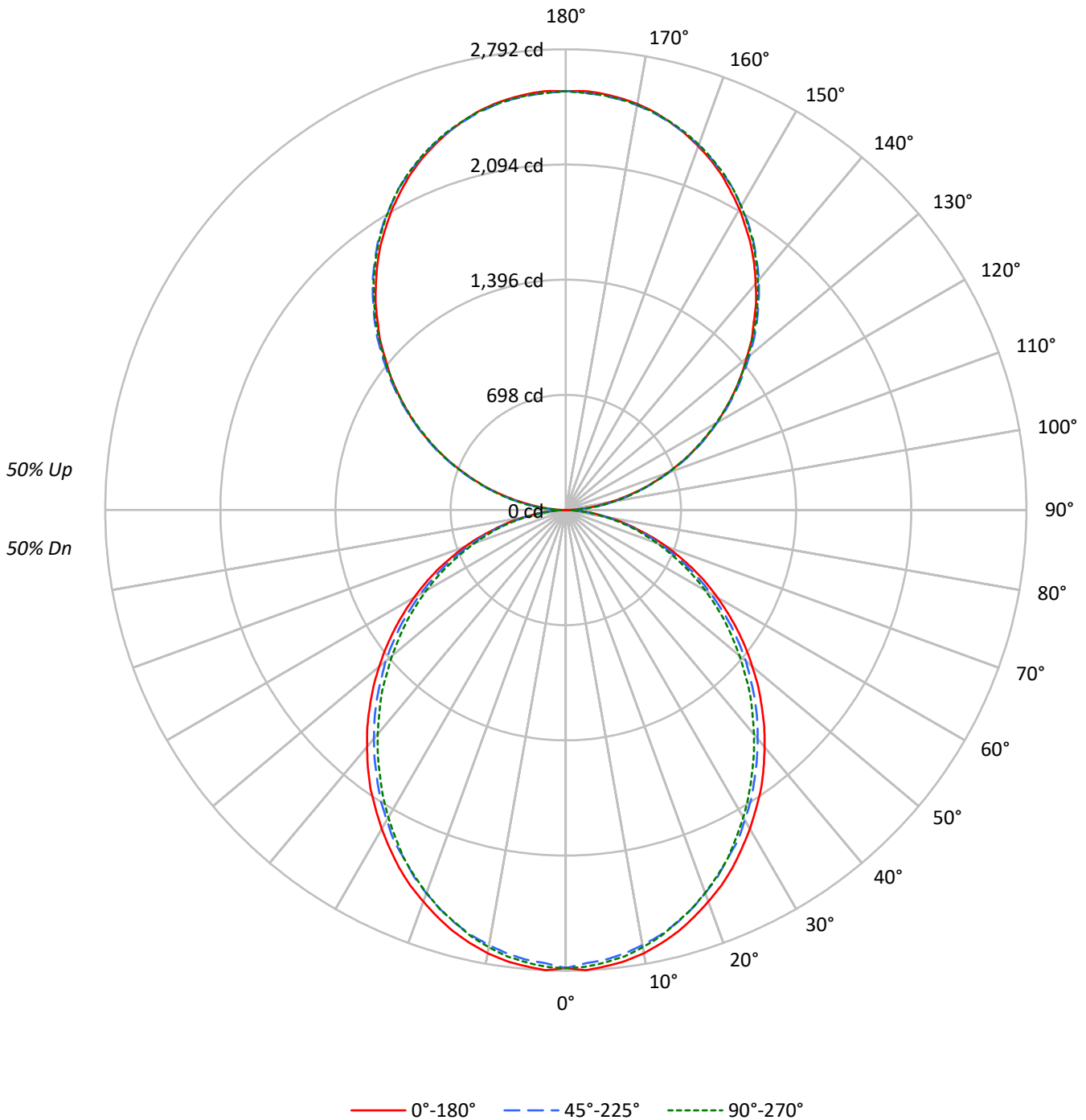
Summary

Lumens per Lamp: N/A
Luminaire Lumens: 14164.8 lumens
Efficiency: N/A
Efficacy: 110.9 lumens/watt
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29
Luminous Opening: Rectangular w/ Sides (W: 3.54' x L: 4.09' x H: 0.1')
CIE Type: General Diffuse

Input Watts (W): 127.7
Input Voltage (V):
Input Current (Ain): NR
Voltage Rise (V): NR
Power Factor: 0.9613
Total Harmonic Distortion (THDi): 0.083
Frequency (hertz): 60
Stabilization Time: NR
Operation Time: NR
Ambient Temperature (°C): NR
Test Distance: 24 FT

TEST NUMBER: P921864
CATALOG NUMBER: DFN2DIP-HX4F0-080D090US940-FLLFL

Luminous Intensity Polar Plot





TEST NUMBER: P921864
 CATALOG NUMBER: DFN2DIP-HX4F0-080D090US940-FLLFLL

COEFFICIENT OF UTILIZATION - ZONAL CAVITY METHOD:

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|--|--|--|--|--|--|--|--|----|--|--|--|--|--|--|--|--|---|
| RF | 20 | | | | | | | | | 20 | | | | | | | | | 20 | | | | | | | | | 20 | | | | | | | | | 20 | | | | | | | | | |
| RC | 80 | | | | | | | | | 70 | | | | | | | | | 50 | | | | | | | | | 30 | | | | | | | | | 10 | | | | | | | | | 0 |
| RW | 70 | 50 | 30 | 10 | 70 | 50 | 30 | 10 | 50 | 30 | 10 | 50 | 30 | 10 | 50 | 30 | 10 | 50 | 30 | 10 | 50 | 30 | 10 | 50 | 30 | 10 | 0 | | | | | | | | | | | | | | | | | | | |
| RCR | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0 | 107 | 107 | 107 | 107 | 99 | 99 | 99 | 99 | 83 | 83 | 83 | 69 | 69 | 69 | 56 | 56 | 56 | 56 | 56 | 56 | 56 | 56 | 56 | 56 | 56 | 56 | 56 | 50 | | | | | | | | | | | | | | | | | | |
| 1 | 98 | 93 | 90 | 86 | 90 | 86 | 83 | 80 | 73 | 71 | 68 | 61 | 59 | 58 | 50 | 48 | 47 | 47 | 47 | 47 | 47 | 47 | 47 | 47 | 47 | 47 | 47 | 42 | | | | | | | | | | | | | | | | | | |
| 2 | 89 | 82 | 75 | 70 | 82 | 75 | 70 | 66 | 64 | 60 | 57 | 53 | 51 | 48 | 44 | 42 | 40 | 40 | 40 | 40 | 40 | 40 | 40 | 40 | 40 | 40 | 40 | 35 | | | | | | | | | | | | | | | | | | |
| 3 | 81 | 72 | 64 | 59 | 75 | 66 | 60 | 55 | 56 | 52 | 48 | 47 | 44 | 41 | 39 | 36 | 34 | 34 | 34 | 34 | 34 | 34 | 34 | 34 | 34 | 34 | 34 | 30 | | | | | | | | | | | | | | | | | | |
| 4 | 74 | 63 | 56 | 50 | 68 | 59 | 52 | 46 | 50 | 45 | 41 | 42 | 38 | 35 | 35 | 32 | 29 | 29 | 29 | 29 | 29 | 29 | 29 | 29 | 29 | 29 | 29 | 26 | | | | | | | | | | | | | | | | | | |
| 5 | 68 | 57 | 48 | 42 | 63 | 53 | 45 | 40 | 45 | 39 | 35 | 38 | 34 | 30 | 31 | 28 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 22 | | | | | | | | | | | | | | | | | | |
| 6 | 63 | 51 | 43 | 37 | 58 | 47 | 40 | 35 | 40 | 35 | 31 | 34 | 30 | 26 | 28 | 25 | 22 | 22 | 22 | 22 | 22 | 22 | 22 | 22 | 22 | 22 | 22 | 20 | | | | | | | | | | | | | | | | | | |
| 7 | 58 | 46 | 38 | 32 | 53 | 43 | 36 | 30 | 37 | 31 | 27 | 31 | 27 | 23 | 26 | 22 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 17 | | | | | | | | | | | | | | | | | | |
| 8 | 54 | 42 | 34 | 29 | 50 | 39 | 32 | 27 | 33 | 28 | 24 | 28 | 24 | 21 | 24 | 20 | 18 | 18 | 18 | 18 | 18 | 18 | 18 | 18 | 18 | 18 | 18 | 16 | | | | | | | | | | | | | | | | | | |
| 9 | 50 | 38 | 30 | 25 | 46 | 35 | 29 | 24 | 31 | 25 | 21 | 26 | 22 | 19 | 22 | 19 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 14 | | | | | | | | | | | | | | | | | | |
| 10 | 47 | 35 | 28 | 23 | 43 | 33 | 26 | 22 | 28 | 23 | 19 | 24 | 20 | 17 | 20 | 17 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 13 | | | | | | | | | | | | | | | | | | |

AVERAGE LUMINANCE (cd/sqm):

| | 0° | 45° | 90° |
|-----|------|------|------|
| 0° | 2064 | 2064 | 2064 |
| 5° | 2067 | 2035 | 2049 |
| 10° | 2051 | 2008 | 2021 |
| 15° | 2021 | 1975 | 1978 |
| 20° | 1980 | 1930 | 1934 |
| 25° | 1940 | 1875 | 1883 |
| 30° | 1889 | 1824 | 1817 |
| 35° | 1841 | 1764 | 1749 |
| 40° | 1782 | 1703 | 1683 |
| 45° | 1723 | 1642 | 1616 |
| 50° | 1659 | 1579 | 1538 |
| 55° | 1592 | 1505 | 1467 |
| 60° | 1515 | 1417 | 1385 |
| 65° | 1433 | 1326 | 1289 |
| 70° | 1327 | 1216 | 1185 |
| 75° | 1180 | 1084 | 1089 |
| 80° | 1004 | 915 | 906 |
| 85° | 729 | 623 | 603 |

MAXIMUM LUMINANCE 45°-90°:

Horizontal Angle: 90°
 Vertical Angle: 90°
 Luminance: 1914 cd/sqm



TEST NUMBER: P921864

CATALOG NUMBER: DFN2DIP-HX4F0-080D090US940-FLLFLL

ZONAL LUMENS:

| Zone | Lumens | % Fixture |
|-----------|---------|-----------|
| 0°-10° | 261.3 | 1.8 |
| 10°-20° | 735.1 | 5.2 |
| 20°-30° | 1080.3 | 7.6 |
| 30°-40° | 1254.7 | 8.9 |
| 40°-50° | 1253.1 | 8.8 |
| 50°-60° | 1092.7 | 7.7 |
| 60°-70° | 807.7 | 5.7 |
| 70°-80° | 457.0 | 3.2 |
| 80°-90° | 127.8 | 0.9 |
| 90°-100° | 157.1 | 1.1 |
| 100°-110° | 499.0 | 3.5 |
| 110°-120° | 854.0 | 6.0 |
| 120°-130° | 1123.1 | 7.9 |
| 130°-140° | 1260.7 | 8.9 |
| 140°-150° | 1236.2 | 8.7 |
| 150°-160° | 1037.0 | 7.3 |
| 160°-170° | 687.7 | 4.9 |
| 170°-180° | 240.4 | 1.7 |
| 0°-30° | 2076.6 | 14.7 |
| 0°-40° | 3331.3 | 23.5 |
| 0°-60° | 5677.0 | 40.1 |
| 0°-90° | 7069.6 | 49.9 |
| 90°-120° | 1510.1 | 10.7 |
| 90°-150° | 5130.1 | 36.2 |
| 90°-180° | 7095.0 | 50.1 |
| 0°-180° | 14164.8 | 100.0 |

CANDELA DISTRIBUTION:

| | 0° | 22.5° | 45° | 67.5° | 90° | Flux |
|------|------|-------|------|-------|------|------|
| 0° | 2776 | 2776 | 2776 | 2776 | 2776 | |
| 5° | 2776 | 2765 | 2736 | 2757 | 2752 | 263 |
| 15° | 2642 | 2626 | 2592 | 2602 | 2589 | 744 |
| 25° | 2392 | 2370 | 2325 | 2330 | 2325 | 1100 |
| 35° | 2063 | 2037 | 1994 | 1978 | 1964 | 1288 |
| 45° | 1679 | 1660 | 1620 | 1591 | 1580 | 1296 |
| 55° | 1271 | 1254 | 1222 | 1190 | 1177 | 1136 |
| 65° | 857 | 841 | 814 | 790 | 777 | 847 |
| 75° | 448 | 443 | 430 | 414 | 419 | 479 |
| 85° | 109 | 107 | 104 | 96 | 94 | 122 |
| 90° | 2 | 28 | 75 | 70 | 73 | 14 |
| 95° | 112 | 133 | 137 | 137 | 133 | 124 |
| 105° | 461 | 467 | 471 | 475 | 475 | 486 |
| 115° | 857 | 869 | 865 | 863 | 857 | 848 |
| 125° | 1246 | 1266 | 1260 | 1253 | 1250 | 1114 |
| 135° | 1612 | 1636 | 1641 | 1638 | 1632 | 1246 |
| 145° | 1957 | 1973 | 1985 | 1987 | 1979 | 1223 |
| 155° | 2238 | 2244 | 2251 | 2262 | 2255 | 1030 |
| 165° | 2435 | 2432 | 2432 | 2448 | 2437 | 687 |
| 175° | 2534 | 2527 | 2523 | 2538 | 2525 | 241 |
| 180° | 2538 | 2538 | 2538 | 2538 | 2538 | |



TEST NUMBER: P921864

CATALOG NUMBER: DFN2DIP-HX4F0-080D090US940-FLLFLL

CANDELA DISTRIBUTION (FULL):

| | 0° | 22.5° | 45° | 67.5° | 90° |
|--------|--------|--------|--------|--------|--------|
| 0° | 2775.7 | 2775.7 | 2775.7 | 2775.7 | 2775.7 |
| 2.5° | 2791.9 | 2778.6 | 2749.1 | 2775.7 | 2770.6 |
| 5° | 2775.7 | 2765.3 | 2735.9 | 2757.1 | 2752.0 |
| 7.5° | 2757.1 | 2741.2 | 2711.8 | 2733.3 | 2727.9 |
| 10° | 2727.9 | 2709.2 | 2677.2 | 2698.4 | 2690.6 |
| 12.5° | 2687.7 | 2671.8 | 2639.8 | 2653.1 | 2647.8 |
| 15° | 2642.4 | 2626.5 | 2591.7 | 2602.5 | 2589.2 |
| 17.5° | 2586.3 | 2570.4 | 2535.6 | 2549.0 | 2535.6 |
| 20° | 2524.9 | 2509.0 | 2471.6 | 2479.6 | 2469.1 |
| 22.5° | 2463.7 | 2439.6 | 2404.8 | 2404.8 | 2399.4 |
| 25° | 2391.5 | 2370.3 | 2325.0 | 2330.0 | 2325.0 |
| 27.5° | 2311.3 | 2292.7 | 2258.1 | 2250.1 | 2236.9 |
| 30° | 2231.5 | 2209.9 | 2170.1 | 2162.1 | 2151.3 |
| 32.5° | 2146.0 | 2130.1 | 2087.3 | 2071.2 | 2060.5 |
| 35° | 2063.2 | 2036.7 | 1993.9 | 1977.7 | 1964.4 |
| 37.5° | 1969.8 | 1945.7 | 1903.0 | 1884.3 | 1871.0 |
| 40° | 1873.8 | 1852.3 | 1809.5 | 1785.7 | 1774.9 |
| 42.5° | 1780.4 | 1758.8 | 1716.4 | 1689.4 | 1673.7 |
| 45° | 1679.0 | 1660.3 | 1620.1 | 1590.9 | 1580.2 |
| 47.5° | 1580.2 | 1561.5 | 1518.7 | 1489.2 | 1473.4 |
| 50° | 1476.0 | 1462.7 | 1425.2 | 1387.9 | 1374.6 |
| 52.5° | 1374.6 | 1355.8 | 1321.3 | 1291.9 | 1273.2 |
| 55° | 1270.6 | 1254.5 | 1222.5 | 1190.5 | 1177.1 |
| 57.5° | 1166.4 | 1153.2 | 1118.3 | 1086.3 | 1075.5 |
| 60° | 1062.2 | 1051.8 | 1014.3 | 984.9 | 977.0 |
| 62.5° | 960.8 | 942.2 | 915.5 | 888.9 | 878.2 |
| 65° | 856.9 | 840.8 | 814.1 | 790.1 | 776.8 |
| 67.5° | 750.1 | 736.6 | 712.7 | 694.1 | 683.3 |
| 70° | 651.3 | 640.5 | 616.5 | 597.8 | 587.3 |
| 72.5° | 549.9 | 539.2 | 525.8 | 507.2 | 499.3 |
| 75° | 448.3 | 443.2 | 429.6 | 413.8 | 419.1 |
| 77.5° | 357.7 | 346.9 | 341.5 | 333.6 | 325.7 |
| 80° | 267.1 | 264.2 | 258.9 | 250.9 | 245.5 |
| 82.5° | 181.6 | 181.6 | 179.0 | 168.2 | 168.2 |
| 85° | 109.3 | 106.7 | 104.2 | 96.0 | 93.5 |
| 87.5° | 48.2 | 42.8 | 37.4 | 29.4 | 26.7 |
| 90° | 2.3 | 27.6 | 75.0 | 70.4 | 72.7 |
| 92.5° | 47.4 | 64.3 | 66.6 | 68.8 | 68.8 |
| 95° | 111.7 | 133.1 | 137.0 | 137.0 | 133.1 |
| 97.5° | 185.9 | 205.8 | 214.3 | 214.3 | 214.3 |
| 100° | 271.6 | 289.3 | 295.3 | 295.3 | 293.1 |
| 102.5° | 361.9 | 375.0 | 383.3 | 385.7 | 383.3 |
| 105° | 460.7 | 466.7 | 471.4 | 475.2 | 475.2 |
| 107.5° | 558.6 | 567.8 | 567.8 | 569.3 | 558.6 |
| 110° | 653.4 | 665.8 | 665.8 | 665.8 | 659.6 |



TEST NUMBER: P921864

CATALOG NUMBER: DFN2DIP-HX4F0-080D090US940-FLLFLL

CANDELA DISTRIBUTION (continued):

| | 0° | 22.5° | 45° | 67.5° | 90° |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 756.0 | 769.0 | 766.7 | 760.6 | 756.0 |
| 115° | 857.0 | 869.2 | 865.4 | 863.2 | 857.0 |
| 117.5° | 957.3 | 974.1 | 963.4 | 957.3 | 951.1 |
| 120° | 1058.3 | 1075.0 | 1058.3 | 1058.3 | 1051.3 |
| 122.5° | 1150.0 | 1171.5 | 1160.8 | 1154.7 | 1150.0 |
| 125° | 1246.5 | 1265.6 | 1259.5 | 1252.6 | 1250.4 |
| 127.5° | 1340.6 | 1364.3 | 1355.9 | 1346.8 | 1340.6 |
| 130° | 1428.6 | 1456.2 | 1452.3 | 1447.7 | 1439.3 |
| 132.5° | 1527.3 | 1548.7 | 1550.2 | 1539.5 | 1533.5 |
| 135° | 1612.2 | 1635.9 | 1640.6 | 1638.3 | 1632.2 |
| 137.5° | 1707.1 | 1726.3 | 1730.1 | 1728.6 | 1719.4 |
| 140° | 1790.6 | 1809.6 | 1820.3 | 1820.3 | 1812.0 |
| 142.5° | 1876.2 | 1895.3 | 1901.5 | 1903.8 | 1895.3 |
| 145° | 1957.4 | 1972.6 | 1984.9 | 1987.2 | 1978.8 |
| 147.5° | 2030.1 | 2049.2 | 2058.3 | 2062.2 | 2053.8 |
| 150° | 2105.1 | 2118.1 | 2126.5 | 2133.3 | 2126.5 |
| 152.5° | 2171.6 | 2184.6 | 2195.3 | 2203.8 | 2195.3 |
| 155° | 2238.2 | 2244.3 | 2251.2 | 2261.9 | 2255.0 |
| 157.5° | 2295.5 | 2300.2 | 2304.0 | 2319.2 | 2308.5 |
| 160° | 2346.8 | 2351.4 | 2353.8 | 2366.7 | 2357.5 |
| 162.5° | 2394.2 | 2394.2 | 2396.6 | 2411.1 | 2400.4 |
| 165° | 2434.8 | 2432.5 | 2432.5 | 2447.8 | 2437.1 |
| 167.5° | 2471.6 | 2464.7 | 2464.7 | 2479.9 | 2469.2 |
| 170° | 2499.1 | 2493.0 | 2490.7 | 2506.0 | 2493.0 |
| 172.5° | 2518.2 | 2512.1 | 2509.8 | 2525.1 | 2512.1 |
| 175° | 2533.5 | 2527.4 | 2522.8 | 2538.2 | 2525.1 |
| 177.5° | 2541.9 | 2535.8 | 2531.2 | 2544.2 | 2531.2 |
| 180° | 2538.2 | 2538.2 | 2538.2 | 2538.2 | 2538.2 |



TEST NUMBER: P921864
 CATALOG NUMBER: DFN2DIP-HX4F0-080D090US940-FLLFLL

CIE UGR TABLE:

| Reflectances: | | | | | | | | | | | |
|-----------------|------|------------------|-------|-------|-------|-------|----------------|-------|-------|-------|-------|
| Ceiling | | 0.7 | 0.7 | 0.5 | 0.5 | 0.3 | 0.7 | 0.7 | 0.5 | 0.5 | 0.3 |
| Wall | | 0.5 | 0.3 | 0.5 | 0.3 | 0.3 | 0.5 | 0.3 | 0.5 | 0.3 | 0.3 |
| Reference plane | | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 |
| Room dimensions | | Viewed crosswise | | | | | Viewed endwise | | | | |
| X=2H | Y=2H | 9.78 | 10.64 | 10.74 | 11.61 | 12.89 | 9.35 | 10.21 | 10.31 | 11.18 | 12.45 |
| | 3H | 11.44 | 12.21 | 12.41 | 13.20 | 14.49 | 10.97 | 11.74 | 11.94 | 12.72 | 14.02 |
| | 4H | 12.03 | 12.76 | 13.01 | 13.75 | 15.05 | 11.56 | 12.29 | 12.54 | 13.27 | 14.58 |
| | 6H | 12.43 | 13.10 | 13.42 | 14.10 | 15.41 | 11.95 | 12.63 | 12.95 | 13.62 | 14.94 |
| | 8H | 12.54 | 13.18 | 13.54 | 14.19 | 15.50 | 12.06 | 12.70 | 13.06 | 13.71 | 15.02 |
| | 12H | 12.58 | 13.19 | 13.59 | 14.20 | 15.53 | 12.10 | 12.71 | 13.11 | 13.71 | 15.05 |
| 4H | 2H | 10.24 | 10.97 | 11.23 | 11.96 | 13.26 | 9.90 | 10.63 | 10.89 | 11.61 | 12.92 |
| | 3H | 12.11 | 12.72 | 13.11 | 13.73 | 15.05 | 11.72 | 12.33 | 12.71 | 13.34 | 14.66 |
| | 4H | 12.82 | 13.38 | 13.83 | 14.39 | 15.73 | 12.42 | 12.98 | 13.43 | 13.99 | 15.33 |
| | 6H | 13.34 | 13.82 | 14.36 | 14.85 | 16.19 | 12.93 | 13.41 | 13.95 | 14.44 | 15.78 |
| | 8H | 13.49 | 13.94 | 14.51 | 14.96 | 16.32 | 13.08 | 13.53 | 14.10 | 14.55 | 15.90 |
| | 12H | 13.56 | 13.97 | 14.60 | 15.01 | 16.37 | 13.14 | 13.55 | 14.18 | 14.59 | 15.95 |
| 8H | 4H | 13.02 | 13.47 | 14.04 | 14.50 | 15.85 | 12.66 | 13.11 | 13.68 | 14.13 | 15.49 |
| | 6H | 13.65 | 14.03 | 14.70 | 15.09 | 16.44 | 13.29 | 13.66 | 14.33 | 14.73 | 16.08 |
| | 8H | 13.88 | 14.20 | 14.93 | 15.26 | 16.62 | 13.51 | 13.83 | 14.56 | 14.89 | 16.25 |
| | 12H | 14.01 | 14.30 | 15.06 | 15.34 | 16.75 | 13.62 | 13.91 | 14.68 | 14.96 | 16.37 |
| 12H | 4H | 13.01 | 13.41 | 14.05 | 14.45 | 15.81 | 12.66 | 13.06 | 13.69 | 14.10 | 15.46 |
| | 6H | 13.69 | 14.01 | 14.74 | 15.06 | 16.43 | 13.33 | 13.66 | 14.38 | 14.71 | 16.08 |
| | 8H | 13.93 | 14.22 | 14.98 | 15.26 | 16.67 | 13.57 | 13.86 | 14.62 | 14.90 | 16.32 |