

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: P928918

Luminaire Tested: DFN2DIP-HX4F0-060D110US935-RLLONL

Issue Date: 12/12/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P928918  
REPORT IS A COMBINATION OF REPORTS P900950 AND P896187  
Test Lab: INNOVATION CENTER  
Issue Date: 12/12/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-HX4F0-060D110US935-RLLONL  
Description: 4 foot, Hexagon Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

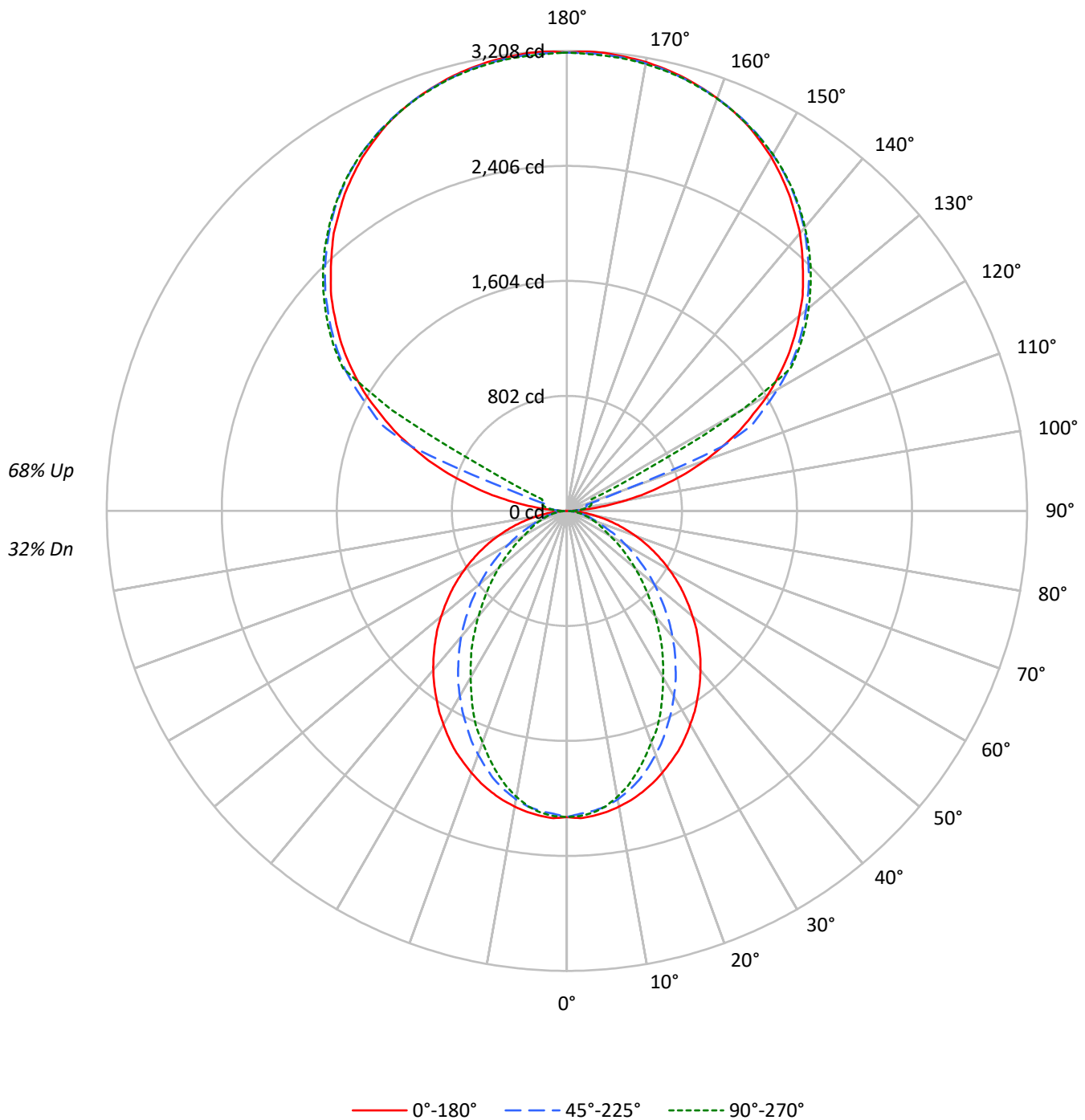
**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 13767.4 lumens  
Efficiency: N/A  
Efficacy: 97.4 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 0.99 / 1.16  
Luminous Opening: Rectangular w/ Sides (W: 3.54' x L: 4.09' x H: 0.1')  
CIE Type: Semi-Indirect  
  
Input Watts (W): 141.4  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.099  
Total Harmonic Distortion (THDi): 0.979  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT

TEST NUMBER: P928918

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### Luminous Intensity Polar Plot



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**COEFFICIENT OF UTILIZATION - ZONAL CAVITY METHOD:**

|     |     |     |     |     |    |    |    |    |    |    |    |    |    |    |    |    |    |
|-----|-----|-----|-----|-----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| RF  | 20  |     |     |     | 20 |    |    |    | 20 |    |    |    | 20 |    |    |    | 20 |
| RC  | 80  |     |     |     | 70 |    |    |    | 50 |    |    |    | 30 |    |    |    | 10 |
| RW  | 70  | 50  | 30  | 10  | 70 | 50 | 30 | 10 | 50 | 30 | 10 | 50 | 30 | 10 | 50 | 30 | 10 |
| RCR |     |     |     |     |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 0   | 103 | 103 | 103 | 103 | 93 | 93 | 93 | 93 | 73 | 73 | 73 | 56 | 56 | 56 | 40 | 40 | 40 |
| 1   | 94  | 90  | 86  | 83  | 85 | 81 | 78 | 75 | 65 | 63 | 61 | 49 | 48 | 47 | 35 | 35 | 34 |
| 2   | 86  | 79  | 73  | 68  | 77 | 71 | 66 | 62 | 57 | 54 | 51 | 44 | 42 | 40 | 31 | 30 | 29 |
| 3   | 78  | 70  | 63  | 57  | 70 | 63 | 57 | 52 | 50 | 46 | 43 | 39 | 36 | 34 | 28 | 26 | 25 |
| 4   | 72  | 62  | 54  | 48  | 64 | 56 | 49 | 44 | 45 | 40 | 37 | 35 | 32 | 29 | 25 | 23 | 22 |
| 5   | 66  | 55  | 47  | 42  | 59 | 50 | 43 | 38 | 40 | 35 | 32 | 31 | 28 | 25 | 23 | 21 | 19 |
| 6   | 61  | 49  | 42  | 36  | 55 | 45 | 38 | 33 | 36 | 31 | 28 | 28 | 25 | 22 | 21 | 19 | 17 |
| 7   | 56  | 44  | 37  | 32  | 51 | 41 | 34 | 29 | 33 | 28 | 24 | 26 | 22 | 20 | 19 | 17 | 15 |
| 8   | 52  | 40  | 33  | 28  | 47 | 37 | 30 | 26 | 30 | 25 | 22 | 24 | 20 | 18 | 18 | 15 | 14 |
| 9   | 48  | 37  | 30  | 25  | 44 | 34 | 27 | 23 | 27 | 23 | 19 | 22 | 18 | 16 | 16 | 14 | 12 |
| 10  | 45  | 34  | 27  | 22  | 41 | 31 | 25 | 21 | 25 | 21 | 17 | 20 | 17 | 14 | 15 | 13 | 11 |

**AVERAGE LUMINANCE (cd/sqm):**

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 1588 | 1588 | 1588 |
| 5°  | 1590 | 1563 | 1572 |
| 10° | 1575 | 1532 | 1521 |
| 15° | 1553 | 1482 | 1442 |
| 20° | 1525 | 1412 | 1345 |
| 25° | 1495 | 1334 | 1252 |
| 30° | 1456 | 1254 | 1133 |
| 35° | 1418 | 1168 | 1028 |
| 40° | 1378 | 1078 | 909  |
| 45° | 1333 | 980  | 800  |
| 50° | 1286 | 880  | 694  |
| 55° | 1237 | 773  | 592  |
| 60° | 1180 | 661  | 488  |
| 65° | 1115 | 548  | 439  |
| 70° | 1035 | 442  | 397  |
| 75° | 936  | 390  | 362  |
| 80° | 792  | 327  | 314  |
| 85° | 553  | 220  | 237  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 90°

Vertical Angle: 90°

Luminance: 1640 cd/sqm

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CATALOG NUMBER: DFN2DIP-HX4F0-060D110US935-RLLONL

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 200.1   | 1.5       |
| 10°-20°   | 549.3   | 4.0       |
| 20°-30°   | 771.2   | 5.6       |
| 30°-40°   | 840.7   | 6.1       |
| 40°-50°   | 772.7   | 5.6       |
| 50°-60°   | 606.8   | 4.4       |
| 60°-70°   | 395.0   | 2.9       |
| 70°-80°   | 203.3   | 1.5       |
| 80°-90°   | 57.5    | 0.4       |
| 90°-100°  | 105.4   | 0.8       |
| 100°-110° | 392.9   | 2.9       |
| 110°-120° | 1042.0  | 7.6       |
| 120°-130° | 1728.3  | 12.6      |
| 130°-140° | 1835.9  | 13.3      |
| 140°-150° | 1706.2  | 12.4      |
| 150°-160° | 1371.8  | 10.0      |
| 160°-170° | 883.9   | 6.4       |
| 170°-180° | 304.2   | 2.2       |
| 0°-30°    | 1520.7  | 11.0      |
| 0°-40°    | 2361.4  | 17.2      |
| 0°-60°    | 3740.9  | 27.2      |
| 0°-90°    | 4396.7  | 31.9      |
| 90°-120°  | 1540.3  | 11.2      |
| 90°-150°  | 6810.7  | 49.5      |
| 90°-180°  | 9371.0  | 68.1      |
| 0°-180°   | 13767.4 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 2135 | 2135  | 2135 | 2135  | 2135 |      |
| 5°   | 2135 | 2126  | 2100 | 2118  | 2112 | 202  |
| 15°  | 2031 | 2009  | 1944 | 1907  | 1888 | 572  |
| 25°  | 1843 | 1782  | 1654 | 1575  | 1546 | 848  |
| 35°  | 1588 | 1490  | 1320 | 1198  | 1155 | 994  |
| 45°  | 1298 | 1169  | 966  | 829   | 782  | 1003 |
| 55°  | 987  | 837   | 628  | 512   | 475  | 882  |
| 65°  | 667  | 510   | 336  | 271   | 265  | 661  |
| 75°  | 356  | 220   | 154  | 141   | 139  | 376  |
| 85°  | 83   | 42    | 37   | 37    | 37   | 95   |
| 90°  | 2    | 28    | 46   | 58    | 62   | 13   |
| 95°  | 150  | 74    | 90   | 102   | 99   | 178  |
| 105° | 703  | 773   | 141  | 166   | 176  | 751  |
| 115° | 1330 | 1369  | 1427 | 356   | 190  | 1309 |
| 125° | 1880 | 1910  | 1954 | 1971  | 1978 | 1677 |
| 135° | 2327 | 2364  | 2384 | 2408  | 2403 | 1797 |
| 145° | 2699 | 2697  | 2736 | 2752  | 2741 | 1688 |
| 155° | 2972 | 2951  | 2979 | 2993  | 2974 | 1370 |
| 165° | 3132 | 3118  | 3125 | 3141  | 3125 | 885  |
| 175° | 3203 | 3187  | 3192 | 3208  | 3185 | 305  |
| 180° | 3196 | 3196  | 3196 | 3196  | 3196 |      |

TEST NUMBER: P928918

CATALOG NUMBER: DFN2DIP-HX4F0-060D110US935-RLLONL

**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 2135.1 | 2135.1 | 2135.1 | 2135.1 | 2135.1 |
| 2.5°   | 2144.8 | 2135.1 | 2113.8 | 2133.2 | 2129.3 |
| 5°     | 2135.1 | 2125.5 | 2100.2 | 2117.7 | 2111.9 |
| 7.5°   | 2117.7 | 2106.2 | 2079.1 | 2086.7 | 2077.1 |
| 10°    | 2094.5 | 2081.0 | 2042.5 | 2036.5 | 2025.0 |
| 12.5°  | 2065.6 | 2048.1 | 1995.9 | 1984.4 | 1963.1 |
| 15°    | 2030.8 | 2009.4 | 1943.8 | 1907.1 | 1887.8 |
| 17.5°  | 1990.2 | 1959.2 | 1878.0 | 1835.6 | 1804.7 |
| 20°    | 1943.8 | 1905.0 | 1808.5 | 1760.3 | 1717.7 |
| 22.5°  | 1893.6 | 1849.1 | 1737.0 | 1671.4 | 1642.4 |
| 25°    | 1843.4 | 1781.5 | 1654.0 | 1574.9 | 1545.8 |
| 27.5°  | 1783.6 | 1717.7 | 1576.7 | 1485.8 | 1441.4 |
| 30°    | 1719.8 | 1646.1 | 1491.6 | 1393.2 | 1340.9 |
| 32.5°  | 1657.9 | 1568.9 | 1410.7 | 1294.6 | 1246.2 |
| 35°    | 1588.4 | 1489.8 | 1319.8 | 1198.0 | 1155.4 |
| 37.5°  | 1520.7 | 1414.3 | 1234.8 | 1101.3 | 1053.1 |
| 40°    | 1449.1 | 1333.3 | 1145.7 | 1008.6 | 958.4  |
| 42.5°  | 1375.8 | 1252.2 | 1057.0 | 913.9  | 865.7  |
| 45°    | 1298.5 | 1168.9 | 966.2  | 828.8  | 782.5  |
| 47.5°  | 1225.1 | 1088.0 | 879.3  | 741.9  | 699.5  |
| 50°    | 1143.9 | 1006.8 | 794.2  | 660.7  | 620.4  |
| 52.5°  | 1064.5 | 919.6  | 713.0  | 585.5  | 548.8  |
| 55°    | 987.3  | 836.6  | 627.9  | 512.1  | 475.4  |
| 57.5°  | 908.2  | 753.5  | 552.7  | 444.4  | 413.5  |
| 60°    | 827.0  | 672.4  | 473.4  | 375.0  | 344.0  |
| 62.5°  | 747.9  | 593.3  | 405.7  | 313.1  | 297.6  |
| 65°    | 666.7  | 510.1  | 336.2  | 270.6  | 264.7  |
| 67.5°  | 589.4  | 432.7  | 270.6  | 237.6  | 231.9  |
| 70°    | 508.2  | 357.5  | 224.0  | 204.8  | 197.0  |
| 72.5°  | 430.9  | 287.8  | 187.4  | 172.0  | 168.1  |
| 75°    | 355.5  | 220.2  | 154.5  | 141.0  | 139.2  |
| 77.5°  | 280.3  | 156.4  | 121.7  | 114.0  | 110.1  |
| 80°    | 210.5  | 112.1  | 92.6   | 85.1   | 85.1   |
| 82.5°  | 146.8  | 75.4   | 63.7   | 59.8   | 59.8   |
| 85°    | 83.0   | 42.4   | 36.7   | 36.7   | 36.7   |
| 87.5°  | 31.0   | 15.4   | 15.4   | 13.5   | 13.5   |
| 90°    | 2.2    | 27.7   | 46.1   | 57.9   | 62.3   |
| 92.5°  | 57.9   | 48.6   | 55.4   | 60.2   | 62.3   |
| 95°    | 150.2  | 73.9   | 90.1   | 101.9  | 99.4   |
| 97.5°  | 270.5  | 81.0   | 117.8  | 124.9  | 127.2  |
| 100°   | 409.5  | 92.6   | 131.8  | 150.2  | 154.9  |
| 102.5° | 561.9  | 557.5  | 136.5  | 161.8  | 168.9  |
| 105°   | 703.1  | 772.6  | 141.2  | 166.4  | 175.8  |
| 107.5° | 867.4  | 925.0  | 145.9  | 171.1  | 180.5  |
| 110°   | 1024.7 | 1073.1 | 404.8  | 173.6  | 182.6  |

TEST NUMBER: P928918

CATALOG NUMBER: DFN2DIP-HX4F0-060D110US935-RLLONL

**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 1172.8 | 1214.2 | 1174.9 | 178.0  | 185.1  |
| 115°   | 1329.8 | 1369.1 | 1427.1 | 356.2  | 189.8  |
| 117.5° | 1466.4 | 1512.5 | 1552.0 | 1221.1 | 615.2  |
| 120°   | 1619.0 | 1653.6 | 1695.4 | 1723.1 | 1410.8 |
| 122.5° | 1748.4 | 1785.5 | 1831.9 | 1845.6 | 1848.1 |
| 125°   | 1880.3 | 1910.5 | 1954.4 | 1970.6 | 1977.5 |
| 127.5° | 2000.5 | 2032.9 | 2067.8 | 2090.9 | 2093.1 |
| 130°   | 2113.9 | 2151.0 | 2176.3 | 2201.8 | 2199.7 |
| 132.5° | 2229.6 | 2259.8 | 2285.1 | 2305.9 | 2303.8 |
| 135°   | 2326.9 | 2363.9 | 2384.5 | 2407.9 | 2403.1 |
| 137.5° | 2428.5 | 2456.2 | 2479.5 | 2502.6 | 2495.7 |
| 140°   | 2527.9 | 2546.5 | 2571.8 | 2592.6 | 2581.1 |
| 142.5° | 2611.3 | 2627.5 | 2657.5 | 2675.9 | 2664.4 |
| 145°   | 2699.2 | 2696.7 | 2736.0 | 2752.3 | 2740.7 |
| 147.5° | 2775.3 | 2768.5 | 2807.7 | 2819.3 | 2810.2 |
| 150°   | 2849.5 | 2833.3 | 2870.3 | 2884.1 | 2872.6 |
| 152.5° | 2911.8 | 2893.4 | 2928.0 | 2942.0 | 2925.9 |
| 155°   | 2972.0 | 2951.3 | 2979.1 | 2992.8 | 2974.4 |
| 157.5° | 3020.6 | 3002.1 | 3023.1 | 3039.2 | 3020.6 |
| 160°   | 3062.3 | 3048.3 | 3062.3 | 3076.0 | 3059.8 |
| 162.5° | 3099.1 | 3085.4 | 3096.9 | 3113.1 | 3092.3 |
| 165°   | 3131.5 | 3117.8 | 3124.7 | 3140.8 | 3124.7 |
| 167.5° | 3157.0 | 3143.1 | 3150.2 | 3166.4 | 3145.6 |
| 170°   | 3178.0 | 3163.9 | 3168.6 | 3184.8 | 3163.9 |
| 172.5° | 3191.6 | 3178.0 | 3182.6 | 3198.8 | 3178.0 |
| 175°   | 3203.2 | 3187.0 | 3191.6 | 3207.9 | 3184.8 |
| 177.5° | 3207.9 | 3191.6 | 3194.1 | 3210.3 | 3189.5 |
| 180°   | 3196.4 | 3196.4 | 3196.4 | 3196.4 | 3196.4 |

TEST NUMBER: P928918

CATALOG NUMBER: DFN2DIP-HX4F0-060D110US935-RLONL

**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 | 6.78             | 7.48  | 7.88  | 8.58  | 10.09 | 2.75           | 3.46 | 3.86 | 4.55 | 6.06 |
|                 | 3H   | 8.45             | 9.08  | 9.56  | 10.18 | 11.71 | 3.93           | 4.56 | 5.05 | 5.67 | 7.19 |
|                 | 4H   | 9.05             | 9.65  | 10.17 | 10.75 | 12.29 | 4.38           | 4.98 | 5.50 | 6.08 | 7.61 |
|                 | 6H   | 9.47             | 10.02 | 10.60 | 11.12 | 12.67 | 4.70           | 5.24 | 5.83 | 6.35 | 7.90 |
|                 | 8H   | 9.59             | 10.11 | 10.73 | 11.24 | 12.77 | 4.78           | 5.30 | 5.92 | 6.43 | 7.97 |
|                 | 12H  | 9.65             | 10.14 | 10.79 | 11.26 | 12.82 | 4.82           | 5.32 | 5.96 | 6.44 | 8.00 |
| 4H              | 2H   | 6.78             | 7.38  | 7.91  | 8.48  | 10.02 | 3.33           | 3.93 | 4.46 | 5.03 | 6.57 |
|                 | 3H   | 8.60             | 9.10  | 9.74  | 10.23 | 11.77 | 4.67           | 5.17 | 5.81 | 6.30 | 7.85 |
|                 | 4H   | 9.29             | 9.74  | 10.43 | 10.87 | 12.43 | 5.22           | 5.67 | 6.36 | 6.79 | 8.36 |
|                 | 6H   | 9.80             | 10.19 | 10.94 | 11.33 | 12.89 | 5.63           | 6.02 | 6.78 | 7.17 | 8.72 |
|                 | 8H   | 9.97             | 10.34 | 11.12 | 11.47 | 13.04 | 5.76           | 6.12 | 6.90 | 7.26 | 8.83 |
|                 | 12H  | 10.06            | 10.39 | 11.22 | 11.54 | 13.12 | 5.82           | 6.15 | 6.98 | 7.30 | 8.87 |
| 8H              | 4H   | 9.25             | 9.61  | 10.39 | 10.75 | 12.32 | 5.49           | 5.85 | 6.63 | 6.99 | 8.56 |
|                 | 6H   | 9.81             | 10.11 | 10.98 | 11.29 | 12.86 | 6.01           | 6.31 | 7.17 | 7.48 | 9.05 |
|                 | 8H   | 10.03            | 10.29 | 11.20 | 11.45 | 13.04 | 6.20           | 6.46 | 7.37 | 7.62 | 9.21 |
|                 | 12H  | 10.16            | 10.39 | 11.33 | 11.55 | 13.17 | 6.31           | 6.54 | 7.49 | 7.70 | 9.32 |
| 12H             | 4H   | 9.19             | 9.52  | 10.35 | 10.67 | 12.25 | 5.49           | 5.82 | 6.65 | 6.97 | 8.54 |
|                 | 6H   | 9.79             | 10.05 | 10.96 | 11.21 | 12.79 | 6.05           | 6.32 | 7.22 | 7.47 | 9.06 |
|                 | 8H   | 10.00            | 10.23 | 11.18 | 11.39 | 13.01 | 6.26           | 6.49 | 7.43 | 7.65 | 9.27 |