

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: P926456

Luminaire Tested: DFN2DIP-TR4F0-060D080US950-RLLFLL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P926456  
REPORT IS A COMBINATION OF REPORTS P900446 AND P897293  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-TR4F0-060D080US950-RLLFLL  
Description: 4 foot, Triangle Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

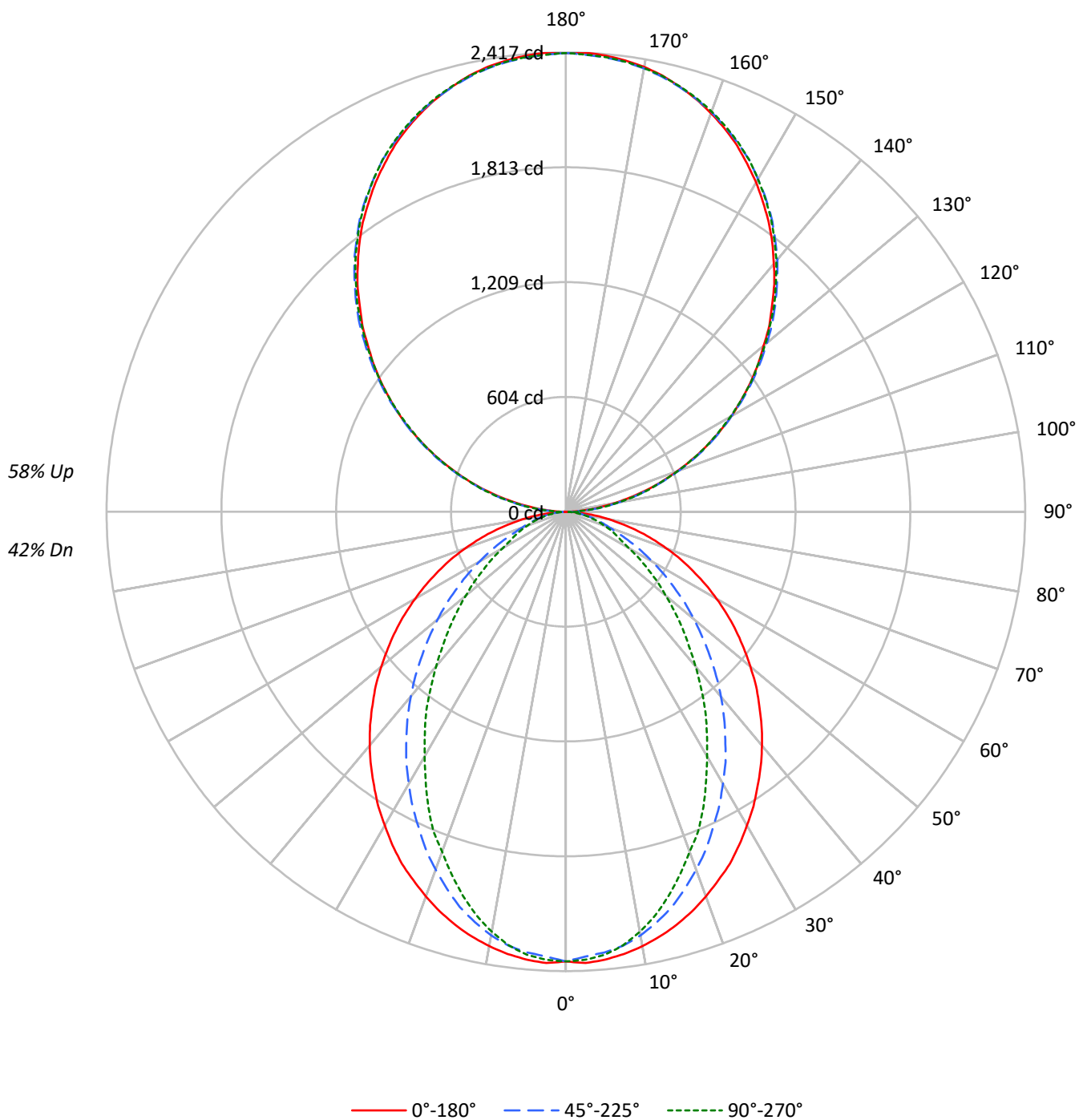
**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 11619.7 lumens  
Efficiency: N/A  
Efficacy: 103.3 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 0.99 / 1.16  
Luminous Opening: Rectangular w/ Sides (W: 3.43' x L: 3.96' x H: 0.1')  
CIE Type: General Diffuse  
  
Input Watts (W): 112.5  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9781  
Total Harmonic Distortion (THDi): 0.075  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT

TEST NUMBER: P926456

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### Luminous Intensity Polar Plot



TEST NUMBER: P926456

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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   | 105 | 105 | 105 | 105 | 96 | 96 | 96 | 96 | 79 | 79 | 79 | 63 | 63 | 63 | 49 | 49 | 49 |
| 1   | 96  | 92  | 89  | 85  | 88 | 84 | 81 | 78 | 70 | 67 | 65 | 56 | 55 | 53 | 44 | 43 | 42 |
| 2   | 88  | 81  | 75  | 70  | 80 | 74 | 69 | 65 | 61 | 58 | 55 | 50 | 47 | 45 | 39 | 37 | 36 |
| 3   | 81  | 72  | 65  | 59  | 73 | 66 | 60 | 55 | 55 | 50 | 47 | 44 | 41 | 39 | 35 | 33 | 31 |
| 4   | 74  | 64  | 56  | 50  | 67 | 58 | 52 | 47 | 49 | 44 | 40 | 40 | 36 | 33 | 31 | 29 | 27 |
| 5   | 68  | 57  | 49  | 43  | 62 | 52 | 45 | 40 | 44 | 39 | 35 | 36 | 32 | 29 | 28 | 26 | 24 |
| 6   | 63  | 51  | 43  | 38  | 57 | 47 | 40 | 35 | 40 | 34 | 30 | 33 | 29 | 26 | 26 | 23 | 21 |
| 7   | 58  | 46  | 38  | 33  | 53 | 43 | 36 | 31 | 36 | 31 | 27 | 30 | 26 | 23 | 24 | 21 | 19 |
| 8   | 54  | 42  | 34  | 29  | 49 | 39 | 32 | 28 | 33 | 28 | 24 | 27 | 23 | 21 | 22 | 19 | 17 |
| 9   | 50  | 38  | 31  | 26  | 46 | 36 | 29 | 25 | 30 | 25 | 22 | 25 | 21 | 19 | 20 | 18 | 16 |
| 10  | 47  | 35  | 28  | 24  | 43 | 33 | 26 | 22 | 28 | 23 | 19 | 23 | 19 | 17 | 19 | 16 | 14 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 1879 | 1879 | 1879 |
| 5°  | 1882 | 1850 | 1861 |
| 10° | 1864 | 1813 | 1801 |
| 15° | 1838 | 1753 | 1707 |
| 20° | 1804 | 1671 | 1592 |
| 25° | 1770 | 1578 | 1481 |
| 30° | 1723 | 1483 | 1340 |
| 35° | 1677 | 1381 | 1217 |
| 40° | 1631 | 1275 | 1075 |
| 45° | 1577 | 1158 | 946  |
| 50° | 1521 | 1040 | 821  |
| 55° | 1462 | 913  | 700  |
| 60° | 1395 | 781  | 576  |
| 65° | 1317 | 647  | 519  |
| 70° | 1223 | 521  | 469  |
| 75° | 1105 | 459  | 427  |
| 80° | 933  | 386  | 370  |
| 85° | 651  | 257  | 277  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 90°

Vertical Angle: 90°

Luminance: 1883 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 221.7   | 1.9       |
| 10°-20°   | 608.7   | 5.2       |
| 20°-30°   | 854.5   | 7.4       |
| 30°-40°   | 931.5   | 8.0       |
| 40°-50°   | 856.2   | 7.4       |
| 50°-60°   | 672.4   | 5.8       |
| 60°-70°   | 437.7   | 3.8       |
| 70°-80°   | 225.3   | 1.9       |
| 80°-90°   | 64.4    | 0.6       |
| 90°-100°  | 149.4   | 1.3       |
| 100°-110° | 474.6   | 4.1       |
| 110°-120° | 812.1   | 7.0       |
| 120°-130° | 1068.1  | 9.2       |
| 130°-140° | 1198.9  | 10.3      |
| 140°-150° | 1175.6  | 10.1      |
| 150°-160° | 986.2   | 8.5       |
| 160°-170° | 654.0   | 5.6       |
| 170°-180° | 228.6   | 2.0       |
| 0°-30°    | 1684.9  | 14.5      |
| 0°-40°    | 2616.4  | 22.5      |
| 0°-60°    | 4144.9  | 35.7      |
| 0°-90°    | 4872.3  | 41.9      |
| 90°-120°  | 1436.1  | 12.4      |
| 90°-150°  | 4878.6  | 42.0      |
| 90°-180°  | 6747.0  | 58.1      |
| 0°-180°   | 11619.7 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 2366 | 2366  | 2366 | 2366  | 2366 |      |
| 5°   | 2366 | 2355  | 2327 | 2346  | 2340 | 224  |
| 15°  | 2250 | 2226  | 2154 | 2113  | 2092 | 634  |
| 25°  | 2042 | 1974  | 1833 | 1745  | 1713 | 939  |
| 35°  | 1760 | 1651  | 1462 | 1327  | 1280 | 1102 |
| 45°  | 1439 | 1295  | 1071 | 918   | 867  | 1111 |
| 55°  | 1094 | 927   | 696  | 567   | 527  | 978  |
| 65°  | 739  | 565   | 372  | 300   | 293  | 732  |
| 75°  | 394  | 244   | 171  | 156   | 154  | 417  |
| 85°  | 92   | 47    | 41   | 41    | 41   | 106  |
| 90°  | 2    | 26    | 71   | 67    | 69   | 11   |
| 95°  | 106  | 127   | 130  | 130   | 127  | 118  |
| 105° | 438  | 444   | 448  | 452   | 452  | 462  |
| 115° | 815  | 827   | 823  | 821   | 815  | 806  |
| 125° | 1185 | 1204  | 1198 | 1191  | 1189 | 1059 |
| 135° | 1533 | 1556  | 1560 | 1558  | 1552 | 1185 |
| 145° | 1861 | 1876  | 1888 | 1890  | 1882 | 1163 |
| 155° | 2128 | 2134  | 2141 | 2151  | 2144 | 980  |
| 165° | 2316 | 2313  | 2313 | 2328  | 2318 | 653  |
| 175° | 2409 | 2404  | 2399 | 2414  | 2401 | 229  |
| 180° | 2414 | 2414  | 2414 | 2414  | 2414 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 2365.7 | 2365.7 | 2365.7 | 2365.7 | 2365.7 |
| 2.5°   | 2376.4 | 2365.7 | 2342.1 | 2363.6 | 2359.3 |
| 5°     | 2365.7 | 2355.0 | 2327.1 | 2346.5 | 2340.1 |
| 7.5°   | 2346.5 | 2333.7 | 2303.7 | 2312.1 | 2301.4 |
| 10°    | 2320.7 | 2305.7 | 2263.1 | 2256.5 | 2243.7 |
| 12.5°  | 2288.7 | 2269.4 | 2211.5 | 2198.8 | 2175.1 |
| 15°    | 2250.1 | 2226.4 | 2153.8 | 2113.1 | 2091.7 |
| 17.5°  | 2205.2 | 2170.8 | 2080.9 | 2033.8 | 1999.6 |
| 20°    | 2153.8 | 2110.8 | 2003.9 | 1950.5 | 1903.2 |
| 22.5°  | 2098.1 | 2048.8 | 1924.6 | 1851.9 | 1819.9 |
| 25°    | 2042.5 | 1973.9 | 1832.6 | 1745.0 | 1712.7 |
| 27.5°  | 1976.2 | 1903.2 | 1747.0 | 1646.3 | 1597.1 |
| 30°    | 1905.5 | 1824.0 | 1652.7 | 1543.7 | 1485.8 |
| 32.5°  | 1836.9 | 1738.4 | 1563.0 | 1434.4 | 1380.8 |
| 35°    | 1759.9 | 1650.7 | 1462.4 | 1327.4 | 1280.2 |
| 37.5°  | 1685.0 | 1567.0 | 1368.1 | 1220.3 | 1166.8 |
| 40°    | 1605.7 | 1477.4 | 1269.5 | 1117.5 | 1061.9 |
| 42.5°  | 1524.4 | 1387.4 | 1171.1 | 1012.6 | 959.2  |
| 45°    | 1438.7 | 1295.2 | 1070.6 | 918.3  | 867.0  |
| 47.5°  | 1357.4 | 1205.5 | 974.2  | 822.1  | 775.0  |
| 50°    | 1267.5 | 1115.5 | 880.0  | 732.1  | 687.4  |
| 52.5°  | 1179.5 | 1019.0 | 790.0  | 648.7  | 608.1  |
| 55°    | 1094.0 | 927.0  | 695.8  | 567.4  | 526.7  |
| 57.5°  | 1006.3 | 834.9  | 612.4  | 492.5  | 458.1  |
| 60°    | 916.3  | 745.1  | 524.5  | 415.5  | 381.1  |
| 62.5°  | 828.6  | 657.4  | 449.5  | 346.9  | 329.8  |
| 65°    | 738.7  | 565.1  | 372.5  | 299.8  | 293.3  |
| 67.5°  | 653.0  | 479.5  | 299.8  | 263.3  | 256.9  |
| 70°    | 563.1  | 396.1  | 248.2  | 227.0  | 218.3  |
| 72.5°  | 477.5  | 318.9  | 207.6  | 190.6  | 186.2  |
| 75°    | 393.9  | 243.9  | 171.2  | 156.3  | 154.3  |
| 77.5°  | 310.5  | 173.3  | 134.9  | 126.3  | 122.0  |
| 80°    | 233.3  | 124.2  | 102.7  | 94.3   | 94.3   |
| 82.5°  | 162.7  | 83.6   | 70.6   | 66.3   | 66.3   |
| 85°    | 92.0   | 47.0   | 40.6   | 40.6   | 40.6   |
| 87.5°  | 34.3   | 17.1   | 17.1   | 15.0   | 15.0   |
| 90°    | 2.2    | 26.2   | 71.4   | 67.0   | 69.2   |
| 92.5°  | 45.1   | 61.2   | 63.3   | 65.4   | 65.4   |
| 95°    | 106.3  | 126.6  | 130.2  | 130.2  | 126.6  |
| 97.5°  | 176.9  | 195.8  | 203.8  | 203.8  | 203.8  |
| 100°   | 258.3  | 275.0  | 280.9  | 280.9  | 278.7  |
| 102.5° | 344.2  | 356.6  | 364.5  | 366.7  | 364.5  |
| 105°   | 438.1  | 443.9  | 448.3  | 451.9  | 451.9  |
| 107.5° | 531.2  | 540.0  | 540.0  | 541.4  | 531.2  |
| 110°   | 621.4  | 633.1  | 633.1  | 633.1  | 627.3  |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 718.9  | 731.3  | 729.1  | 723.3  | 718.9  |
| 115°   | 815.0  | 826.6  | 823.0  | 820.8  | 815.0  |
| 117.5° | 910.3  | 926.3  | 916.1  | 910.3  | 904.5  |
| 120°   | 1006.4 | 1022.4 | 1006.4 | 1006.4 | 999.8  |
| 122.5° | 1093.7 | 1114.1 | 1103.9 | 1098.1 | 1093.7 |
| 125°   | 1185.3 | 1203.6 | 1197.7 | 1191.2 | 1189.1 |
| 127.5° | 1274.9 | 1297.4 | 1289.4 | 1280.7 | 1274.9 |
| 130°   | 1358.6 | 1384.7 | 1381.1 | 1376.8 | 1368.8 |
| 132.5° | 1452.5 | 1472.8 | 1474.3 | 1464.1 | 1458.3 |
| 135°   | 1533.2 | 1555.8 | 1560.2 | 1558.0 | 1552.2 |
| 137.5° | 1623.4 | 1641.6 | 1645.3 | 1643.8 | 1635.1 |
| 140°   | 1702.8 | 1720.9 | 1731.1 | 1731.1 | 1723.1 |
| 142.5° | 1784.3 | 1802.5 | 1808.3 | 1810.5 | 1802.5 |
| 145°   | 1861.4 | 1875.9 | 1887.6 | 1889.8 | 1881.8 |
| 147.5° | 1930.5 | 1948.7 | 1957.4 | 1961.1 | 1953.1 |
| 150°   | 2001.9 | 2014.2 | 2022.2 | 2028.8 | 2022.2 |
| 152.5° | 2065.1 | 2077.5 | 2087.7 | 2095.7 | 2087.7 |
| 155°   | 2128.5 | 2134.3 | 2140.9 | 2151.0 | 2144.5 |
| 157.5° | 2183.0 | 2187.4 | 2191.1 | 2205.6 | 2195.4 |
| 160°   | 2231.8 | 2236.2 | 2238.4 | 2250.7 | 2242.0 |
| 162.5° | 2276.9 | 2276.9 | 2279.1 | 2292.9 | 2282.7 |
| 165°   | 2315.5 | 2313.3 | 2313.3 | 2327.9 | 2317.6 |
| 167.5° | 2350.4 | 2343.9 | 2343.9 | 2358.4 | 2348.2 |
| 170°   | 2376.6 | 2370.8 | 2368.6 | 2383.2 | 2370.8 |
| 172.5° | 2394.8 | 2389.0 | 2386.8 | 2401.3 | 2389.0 |
| 175°   | 2409.3 | 2403.5 | 2399.1 | 2413.7 | 2401.3 |
| 177.5° | 2417.3 | 2411.5 | 2407.1 | 2419.5 | 2407.1 |
| 180°   | 2413.7 | 2413.7 | 2413.7 | 2413.7 | 2413.7 |

TEST NUMBER: P926456

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**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 | 8.53             | 9.30  | 9.56  | 10.33 | 11.71 | 4.50           | 5.27 | 5.53 | 6.30 | 7.69  |
|                 | 3H   | 10.20            | 10.89 | 11.24 | 11.93 | 13.33 | 5.69           | 6.38 | 6.73 | 7.42 | 8.82  |
|                 | 4H   | 10.81            | 11.46 | 11.86 | 12.50 | 13.91 | 6.14           | 6.79 | 7.19 | 7.83 | 9.24  |
|                 | 6H   | 11.23            | 11.82 | 12.29 | 12.87 | 14.29 | 6.46           | 7.05 | 7.52 | 8.10 | 9.53  |
|                 | 8H   | 11.35            | 11.92 | 12.42 | 12.98 | 14.40 | 6.54           | 7.11 | 7.61 | 8.18 | 9.60  |
|                 | 12H  | 11.41            | 11.95 | 12.48 | 13.01 | 14.45 | 6.59           | 7.13 | 7.66 | 8.18 | 9.63  |
| 4H              | 2H   | 8.54             | 9.19  | 9.60  | 10.23 | 11.65 | 5.09           | 5.74 | 6.15 | 6.79 | 8.20  |
|                 | 3H   | 10.36            | 10.90 | 11.43 | 11.98 | 13.40 | 6.44           | 6.98 | 7.50 | 8.05 | 9.47  |
|                 | 4H   | 11.05            | 11.55 | 12.12 | 12.61 | 14.06 | 6.98           | 7.48 | 8.05 | 8.54 | 9.99  |
|                 | 6H   | 11.56            | 11.99 | 12.64 | 13.08 | 14.52 | 7.40           | 7.82 | 8.48 | 8.91 | 10.35 |
|                 | 8H   | 11.74            | 12.13 | 12.82 | 13.21 | 14.67 | 7.53           | 7.92 | 8.61 | 9.00 | 10.46 |
|                 | 12H  | 11.83            | 12.19 | 12.93 | 13.28 | 14.74 | 7.59           | 7.95 | 8.69 | 9.04 | 10.50 |
| 8H              | 4H   | 11.02            | 11.41 | 12.10 | 12.49 | 13.95 | 7.26           | 7.65 | 8.34 | 8.73 | 10.19 |
|                 | 6H   | 11.58            | 11.91 | 12.68 | 13.03 | 14.48 | 7.78           | 8.10 | 8.88 | 9.22 | 10.68 |
|                 | 8H   | 11.80            | 12.08 | 12.91 | 13.19 | 14.66 | 7.97           | 8.25 | 9.08 | 9.36 | 10.83 |
|                 | 12H  | 11.93            | 12.18 | 13.04 | 13.28 | 14.79 | 8.08           | 8.34 | 9.20 | 9.43 | 10.95 |
| 12H             | 4H   | 10.97            | 11.32 | 12.06 | 12.42 | 13.88 | 7.26           | 7.62 | 8.36 | 8.71 | 10.17 |
|                 | 6H   | 11.55            | 11.84 | 12.66 | 12.94 | 14.42 | 7.82           | 8.11 | 8.93 | 9.21 | 10.69 |
|                 | 8H   | 11.77            | 12.03 | 12.89 | 13.12 | 14.64 | 8.03           | 8.29 | 9.15 | 9.38 | 10.90 |