

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: P902613

Luminaire Tested: DFN2DIP-HX3F0-060D090US830-RLLFLL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P902613  
REPORT IS A COMBINATION OF REPORTS P899292 AND P896089  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-HX3F0-060D090US830-RLLFLL  
Description: 3 foot, Hexagon Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

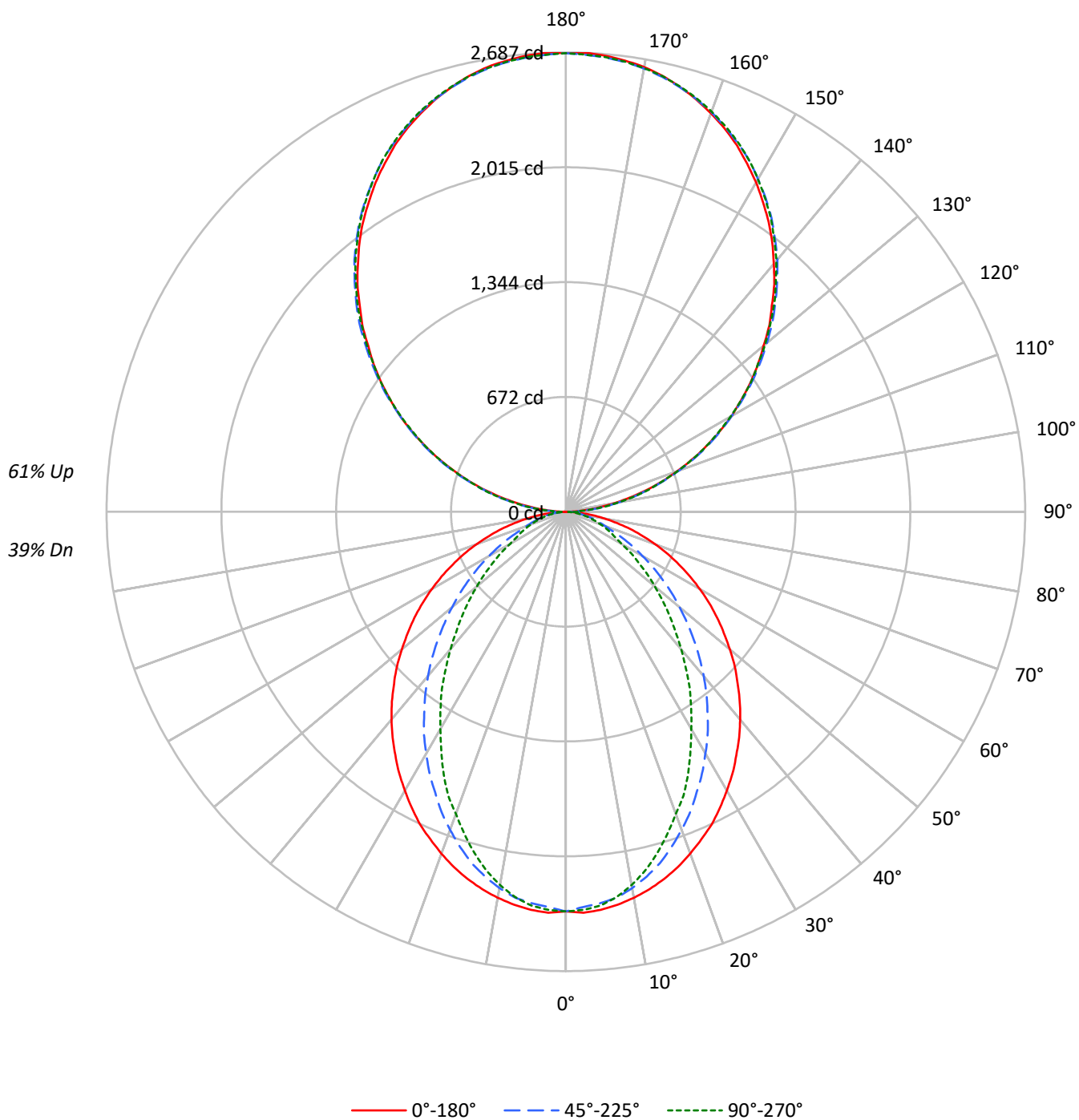
Lumens per Lamp: N/A  
Luminaire Lumens: 12314.3 lumens  
Efficiency: N/A  
Efficacy: 96.4 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 0.99 / 1.16  
Luminous Opening: Rectangular w/ Sides (W: 2.84' x L: 3.28' x H: 0.1')  
CIE Type: Semi-Indirect

Input Watts (W): 127.8  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9933  
Total Harmonic Distortion (THDi): 0.066  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT

TEST NUMBER: P902613

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### Luminous Intensity Polar Plot



TEST NUMBER: P902613

CATALOG NUMBER: DFN2DIP-HX3F0-060D090US830-RLFL

**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 | 95 | 95 | 95 | 95 | 77 | 77 | 77 | 61 | 61 | 61 | 46 | 46 | 46 |
| 1   | 96  | 92  | 88  | 85  | 87 | 83 | 80 | 78 | 68 | 66 | 64 | 54 | 53 | 51 | 41 | 40 | 40 |
| 2   | 87  | 80  | 75  | 70  | 79 | 73 | 68 | 64 | 60 | 57 | 54 | 48 | 46 | 44 | 37 | 35 | 34 |
| 3   | 80  | 71  | 64  | 58  | 73 | 65 | 59 | 54 | 53 | 49 | 46 | 43 | 40 | 37 | 33 | 31 | 29 |
| 4   | 73  | 63  | 55  | 50  | 66 | 58 | 51 | 46 | 48 | 43 | 39 | 38 | 35 | 32 | 30 | 27 | 26 |
| 5   | 67  | 56  | 48  | 43  | 61 | 52 | 45 | 40 | 43 | 38 | 34 | 35 | 31 | 28 | 27 | 24 | 22 |
| 6   | 62  | 51  | 43  | 37  | 56 | 46 | 40 | 35 | 39 | 33 | 30 | 31 | 28 | 25 | 25 | 22 | 20 |
| 7   | 57  | 46  | 38  | 33  | 52 | 42 | 35 | 30 | 35 | 30 | 26 | 29 | 25 | 22 | 22 | 20 | 18 |
| 8   | 53  | 41  | 34  | 29  | 49 | 38 | 32 | 27 | 32 | 27 | 23 | 26 | 22 | 20 | 21 | 18 | 16 |
| 9   | 50  | 38  | 31  | 26  | 45 | 35 | 29 | 24 | 29 | 24 | 21 | 24 | 20 | 18 | 19 | 17 | 15 |
| 10  | 46  | 35  | 28  | 23  | 42 | 32 | 26 | 22 | 27 | 22 | 19 | 22 | 19 | 16 | 18 | 15 | 13 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 2707 | 2707 | 2707 |
| 5°  | 2711 | 2663 | 2680 |
| 10° | 2682 | 2609 | 2591 |
| 15° | 2644 | 2520 | 2455 |
| 20° | 2594 | 2400 | 2289 |
| 25° | 2543 | 2265 | 2128 |
| 30° | 2474 | 2127 | 1924 |
| 35° | 2407 | 1979 | 1745 |
| 40° | 2339 | 1825 | 1541 |
| 45° | 2259 | 1656 | 1355 |
| 50° | 2178 | 1484 | 1174 |
| 55° | 2092 | 1302 | 1001 |
| 60° | 1992 | 1111 | 822  |
| 65° | 1877 | 917  | 738  |
| 70° | 1738 | 736  | 666  |
| 75° | 1564 | 645  | 603  |
| 80° | 1311 | 535  | 518  |
| 85° | 896  | 349  | 381  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 90°

Vertical Angle: 90°

Luminance: 2524 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 219.1   | 1.8       |
| 10°-20°   | 601.3   | 4.9       |
| 20°-30°   | 844.3   | 6.9       |
| 30°-40°   | 920.3   | 7.5       |
| 40°-50°   | 845.9   | 6.9       |
| 50°-60°   | 664.3   | 5.4       |
| 60°-70°   | 432.4   | 3.5       |
| 70°-80°   | 222.6   | 1.8       |
| 80°-90°   | 64.5    | 0.5       |
| 90°-100°  | 166.0   | 1.3       |
| 100°-110° | 527.5   | 4.3       |
| 110°-120° | 902.7   | 7.3       |
| 120°-130° | 1187.2  | 9.6       |
| 130°-140° | 1332.5  | 10.8      |
| 140°-150° | 1306.7  | 10.6      |
| 150°-160° | 1096.1  | 8.9       |
| 160°-170° | 726.9   | 5.9       |
| 170°-180° | 254.1   | 2.1       |
| 0°-30°    | 1664.7  | 13.5      |
| 0°-40°    | 2585.0  | 21.0      |
| 0°-60°    | 4095.1  | 33.3      |
| 0°-90°    | 4814.6  | 39.1      |
| 90°-120°  | 1596.2  | 13.0      |
| 90°-150°  | 5422.6  | 44.0      |
| 90°-180°  | 7500.0  | 60.9      |
| 0°-180°   | 12314.3 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 2337 | 2337  | 2337 | 2337  | 2337 |      |
| 5°   | 2337 | 2327  | 2299 | 2318  | 2312 | 222  |
| 15°  | 2223 | 2200  | 2128 | 2088  | 2067 | 626  |
| 25°  | 2018 | 1950  | 1811 | 1724  | 1692 | 928  |
| 35°  | 1739 | 1631  | 1445 | 1312  | 1265 | 1088 |
| 45°  | 1421 | 1280  | 1058 | 907   | 857  | 1098 |
| 55°  | 1081 | 916   | 687  | 561   | 520  | 966  |
| 65°  | 730  | 558   | 368  | 296   | 290  | 724  |
| 75°  | 389  | 241   | 169  | 154   | 152  | 412  |
| 85°  | 91   | 46    | 40   | 40    | 40   | 104  |
| 90°  | 2    | 29    | 79   | 74    | 77   | 12   |
| 95°  | 118  | 141   | 145  | 145   | 141  | 131  |
| 105° | 487  | 493   | 498  | 502   | 502  | 514  |
| 115° | 906  | 919   | 915  | 912   | 906  | 896  |
| 125° | 1318 | 1338  | 1331 | 1324  | 1322 | 1177 |
| 135° | 1704 | 1729  | 1734 | 1732  | 1725 | 1317 |
| 145° | 2069 | 2085  | 2098 | 2100  | 2092 | 1293 |
| 155° | 2366 | 2372  | 2380 | 2391  | 2384 | 1089 |
| 165° | 2574 | 2571  | 2571 | 2587  | 2576 | 726  |
| 175° | 2678 | 2671  | 2667 | 2683  | 2669 | 254  |
| 180° | 2683 | 2683  | 2683 | 2683  | 2683 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 2337.3 | 2337.3 | 2337.3 | 2337.3 | 2337.3 |
| 2.5°   | 2347.9 | 2337.3 | 2313.9 | 2335.2 | 2331.0 |
| 5°     | 2337.3 | 2326.8 | 2299.1 | 2318.3 | 2312.0 |
| 7.5°   | 2318.3 | 2305.6 | 2276.1 | 2284.3 | 2273.8 |
| 10°    | 2292.8 | 2278.0 | 2235.9 | 2229.4 | 2216.8 |
| 12.5°  | 2261.3 | 2242.1 | 2184.9 | 2172.4 | 2149.0 |
| 15°    | 2223.1 | 2199.7 | 2127.9 | 2087.7 | 2066.6 |
| 17.5°  | 2178.7 | 2144.8 | 2055.9 | 2009.4 | 1975.6 |
| 20°    | 2127.9 | 2085.5 | 1979.8 | 1927.0 | 1880.4 |
| 22.5°  | 2072.9 | 2024.2 | 1901.5 | 1829.7 | 1798.0 |
| 25°    | 2018.0 | 1950.2 | 1810.6 | 1724.0 | 1692.1 |
| 27.5°  | 1952.5 | 1880.4 | 1726.0 | 1626.5 | 1577.9 |
| 30°    | 1882.6 | 1802.0 | 1632.9 | 1525.1 | 1467.9 |
| 32.5°  | 1814.9 | 1717.5 | 1544.3 | 1417.2 | 1364.2 |
| 35°    | 1738.8 | 1630.9 | 1444.8 | 1311.5 | 1264.8 |
| 37.5°  | 1664.7 | 1548.2 | 1351.7 | 1205.6 | 1152.8 |
| 40°    | 1586.4 | 1459.6 | 1254.2 | 1104.1 | 1049.1 |
| 42.5°  | 1506.1 | 1370.7 | 1157.1 | 1000.4 | 947.7  |
| 45°    | 1421.4 | 1279.6 | 1057.7 | 907.3  | 856.6  |
| 47.5°  | 1341.1 | 1191.0 | 962.5  | 812.2  | 765.7  |
| 50°    | 1252.3 | 1102.1 | 869.4  | 723.3  | 679.1  |
| 52.5°  | 1165.4 | 1006.7 | 780.5  | 640.9  | 600.8  |
| 55°    | 1080.8 | 915.9  | 687.4  | 560.6  | 520.4  |
| 57.5°  | 994.2  | 824.9  | 605.0  | 486.5  | 452.6  |
| 60°    | 905.3  | 736.1  | 518.2  | 410.5  | 376.5  |
| 62.5°  | 818.7  | 649.5  | 444.1  | 342.7  | 325.8  |
| 65°    | 729.8  | 558.4  | 368.1  | 296.2  | 289.7  |
| 67.5°  | 645.2  | 473.7  | 296.2  | 260.1  | 253.8  |
| 70°    | 556.3  | 391.3  | 245.2  | 224.2  | 215.7  |
| 72.5°  | 471.7  | 315.1  | 205.1  | 188.3  | 184.0  |
| 75°    | 389.2  | 241.0  | 169.2  | 154.4  | 152.4  |
| 77.5°  | 306.8  | 171.3  | 133.3  | 124.8  | 120.6  |
| 80°    | 230.5  | 122.7  | 101.4  | 93.1   | 93.1   |
| 82.5°  | 160.7  | 82.6   | 69.7   | 65.5   | 65.5   |
| 85°    | 90.9   | 46.5   | 40.2   | 40.2   | 40.2   |
| 87.5°  | 33.9   | 16.9   | 16.9   | 14.8   | 14.8   |
| 90°    | 2.5    | 29.1   | 79.3   | 74.4   | 76.8   |
| 92.5°  | 50.1   | 68.0   | 70.4   | 72.8   | 72.8   |
| 95°    | 118.1  | 140.7  | 144.8  | 144.8  | 140.7  |
| 97.5°  | 196.5  | 217.5  | 226.5  | 226.5  | 226.5  |
| 100°   | 287.1  | 305.8  | 312.2  | 312.2  | 309.8  |
| 102.5° | 382.6  | 396.3  | 405.2  | 407.6  | 405.2  |
| 105°   | 486.9  | 493.3  | 498.2  | 502.3  | 502.3  |
| 107.5° | 590.4  | 600.1  | 600.1  | 601.7  | 590.4  |
| 110°   | 690.7  | 703.7  | 703.7  | 703.7  | 697.2  |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 799.1  | 812.8  | 810.4  | 804.0  | 799.1  |
| 115°   | 905.9  | 918.8  | 914.7  | 912.4  | 905.9  |
| 117.5° | 1011.8 | 1029.6 | 1018.3 | 1011.8 | 1005.3 |
| 120°   | 1118.6 | 1136.3 | 1118.6 | 1118.6 | 1111.3 |
| 122.5° | 1215.6 | 1238.3 | 1227.0 | 1220.5 | 1215.6 |
| 125°   | 1317.6 | 1337.8 | 1331.3 | 1324.0 | 1321.6 |
| 127.5° | 1417.0 | 1442.1 | 1433.2 | 1423.5 | 1417.0 |
| 130°   | 1510.0 | 1539.2 | 1535.1 | 1530.2 | 1521.4 |
| 132.5° | 1614.4 | 1637.0 | 1638.6 | 1627.3 | 1620.9 |
| 135°   | 1704.1 | 1729.2 | 1734.1 | 1731.6 | 1725.2 |
| 137.5° | 1804.4 | 1824.7 | 1828.7 | 1827.1 | 1817.4 |
| 140°   | 1892.6 | 1912.8 | 1924.1 | 1924.1 | 1915.2 |
| 142.5° | 1983.2 | 2003.4 | 2009.9 | 2012.3 | 2003.4 |
| 145°   | 2069.0 | 2085.1 | 2098.0 | 2100.5 | 2091.6 |
| 147.5° | 2145.8 | 2166.0 | 2175.7 | 2179.7 | 2170.9 |
| 150°   | 2225.1 | 2238.8 | 2247.7 | 2254.9 | 2247.7 |
| 152.5° | 2295.4 | 2309.1 | 2320.4 | 2329.4 | 2320.4 |
| 155°   | 2365.8 | 2372.2 | 2379.5 | 2390.9 | 2383.6 |
| 157.5° | 2426.4 | 2431.3 | 2435.3 | 2451.5 | 2440.1 |
| 160°   | 2480.6 | 2485.5 | 2487.9 | 2501.6 | 2491.9 |
| 162.5° | 2530.7 | 2530.7 | 2533.2 | 2548.5 | 2537.2 |
| 165°   | 2573.6 | 2571.2 | 2571.2 | 2587.4 | 2576.1 |
| 167.5° | 2612.4 | 2605.2 | 2605.2 | 2621.3 | 2610.0 |
| 170°   | 2641.6 | 2635.1 | 2632.7 | 2648.8 | 2635.1 |
| 172.5° | 2661.7 | 2655.3 | 2652.9 | 2669.1 | 2655.3 |
| 175°   | 2678.0 | 2671.4 | 2666.6 | 2682.9 | 2669.1 |
| 177.5° | 2686.8 | 2680.4 | 2675.5 | 2689.3 | 2675.5 |
| 180°   | 2682.9 | 2682.9 | 2682.9 | 2682.9 | 2682.9 |

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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 | 9.45             | 10.20 | 10.50 | 11.25 | 12.67 | 5.43           | 6.18 | 6.48  | 7.23  | 8.65  |
|                 | 3H   | 11.11            | 11.78 | 12.17 | 12.84 | 14.28 | 6.60           | 7.27 | 7.67  | 8.33  | 9.77  |
|                 | 4H   | 11.71            | 12.35 | 12.79 | 13.41 | 14.86 | 7.05           | 7.68 | 8.12  | 8.74  | 10.19 |
|                 | 6H   | 12.12            | 12.71 | 13.21 | 13.77 | 15.23 | 7.36           | 7.94 | 8.44  | 9.01  | 10.47 |
|                 | 8H   | 12.25            | 12.80 | 13.33 | 13.88 | 15.34 | 7.45           | 8.00 | 8.53  | 9.08  | 10.54 |
|                 | 12H  | 12.30            | 12.83 | 13.39 | 13.90 | 15.38 | 7.49           | 8.01 | 8.58  | 9.09  | 10.57 |
| 4H              | 2H   | 9.46             | 10.09 | 10.54 | 11.15 | 12.60 | 6.01           | 6.64 | 7.09  | 7.70  | 9.15  |
|                 | 3H   | 11.27            | 11.80 | 12.36 | 12.89 | 14.35 | 7.35           | 7.87 | 8.43  | 8.96  | 10.42 |
|                 | 4H   | 11.95            | 12.44 | 13.04 | 13.52 | 15.00 | 7.89           | 8.37 | 8.98  | 9.45  | 10.93 |
|                 | 6H   | 12.46            | 12.87 | 13.56 | 13.97 | 15.45 | 8.30           | 8.71 | 9.40  | 9.81  | 11.29 |
|                 | 8H   | 12.63            | 13.01 | 13.73 | 14.11 | 15.60 | 8.42           | 8.81 | 9.52  | 9.90  | 11.39 |
|                 | 12H  | 12.71            | 13.06 | 13.83 | 14.17 | 15.67 | 8.48           | 8.83 | 9.60  | 9.94  | 11.43 |
| 8H              | 4H   | 11.91            | 12.30 | 13.01 | 13.40 | 14.89 | 8.16           | 8.54 | 9.25  | 9.64  | 11.13 |
|                 | 6H   | 12.47            | 12.79 | 13.59 | 13.93 | 15.41 | 8.66           | 8.98 | 9.79  | 10.12 | 11.61 |
|                 | 8H   | 12.68            | 12.96 | 13.81 | 14.08 | 15.59 | 8.85           | 9.13 | 9.98  | 10.25 | 11.76 |
|                 | 12H  | 12.81            | 13.06 | 13.94 | 14.17 | 15.71 | 8.96           | 9.21 | 10.09 | 10.32 | 11.87 |
| 12H             | 4H   | 11.86            | 12.21 | 12.98 | 13.32 | 14.82 | 8.16           | 8.51 | 9.27  | 9.61  | 11.11 |
|                 | 6H   | 12.44            | 12.72 | 13.57 | 13.84 | 15.35 | 8.71           | 8.99 | 9.84  | 10.11 | 11.62 |
|                 | 8H   | 12.66            | 12.90 | 13.79 | 14.02 | 15.56 | 8.91           | 9.16 | 10.04 | 10.27 | 11.82 |