

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: P911880

Luminaire Tested: DFN2DIP-SQ3F0-060D070US850-FLLFLL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P911880  
REPORT IS A COMBINATION OF REPORTS P899919 AND P896733  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-SQ3F0-060D070US850-FLLFLL  
Description: 3 foot, Square Define Geo, with Direct Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

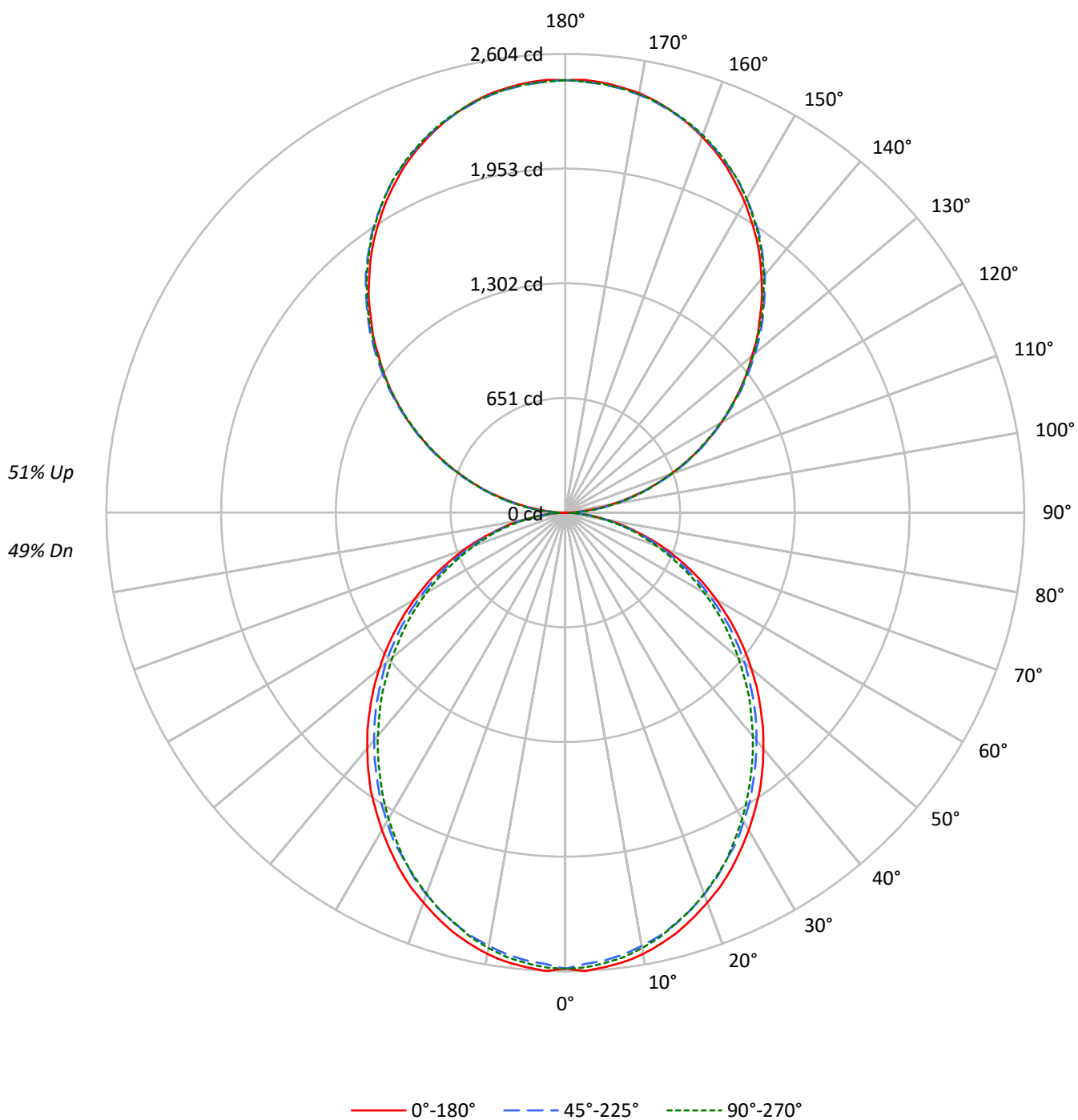
Lumens per Lamp: N/A  
Luminaire Lumens: 13457.7 lumens  
Efficiency: N/A  
Efficacy: 127.1 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 3.06' x L: 3.06' x H: 0.1')  
CIE Type: General Diffuse

Input Watts (W): 105.9  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9971  
Total Harmonic Distortion (THDi): 0.049  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT

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### Luminous Intensity Polar Plot



TEST NUMBER: P911880

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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   | 107 | 107 | 107 | 107 | 98 | 98 | 98 | 98 | 83 | 83 | 83 | 68 | 68 | 68 | 55 | 55 | 55 |
| 1   | 98  | 93  | 89  | 86  | 90 | 86 | 83 | 80 | 73 | 70 | 68 | 60 | 59 | 57 | 49 | 48 | 47 |
| 2   | 89  | 81  | 75  | 70  | 82 | 75 | 70 | 65 | 64 | 60 | 56 | 53 | 50 | 48 | 43 | 41 | 39 |
| 3   | 81  | 72  | 64  | 58  | 74 | 66 | 60 | 55 | 56 | 51 | 47 | 47 | 43 | 40 | 38 | 36 | 33 |
| 4   | 74  | 63  | 55  | 49  | 68 | 59 | 52 | 46 | 50 | 45 | 40 | 42 | 38 | 34 | 34 | 31 | 29 |
| 5   | 68  | 56  | 48  | 42  | 62 | 52 | 45 | 40 | 45 | 39 | 35 | 37 | 33 | 30 | 31 | 28 | 25 |
| 6   | 63  | 51  | 43  | 37  | 58 | 47 | 40 | 35 | 40 | 35 | 30 | 34 | 29 | 26 | 28 | 25 | 22 |
| 7   | 58  | 46  | 38  | 32  | 53 | 42 | 35 | 30 | 36 | 31 | 27 | 31 | 26 | 23 | 25 | 22 | 20 |
| 8   | 54  | 41  | 34  | 28  | 49 | 39 | 32 | 27 | 33 | 28 | 24 | 28 | 24 | 21 | 23 | 20 | 18 |
| 9   | 50  | 38  | 30  | 25  | 46 | 35 | 29 | 24 | 30 | 25 | 21 | 26 | 22 | 19 | 22 | 18 | 16 |
| 10  | 47  | 35  | 28  | 23  | 43 | 32 | 26 | 22 | 28 | 23 | 19 | 24 | 20 | 17 | 20 | 17 | 14 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 2967 | 2967 | 2967 |
| 5°  | 2969 | 2923 | 2944 |
| 10° | 2944 | 2882 | 2903 |
| 15° | 2898 | 2833 | 2840 |
| 20° | 2838 | 2765 | 2775 |
| 25° | 2778 | 2684 | 2700 |
| 30° | 2703 | 2609 | 2606 |
| 35° | 2632 | 2520 | 2506 |
| 40° | 2545 | 2431 | 2410 |
| 45° | 2458 | 2341 | 2313 |
| 50° | 2362 | 2246 | 2200 |
| 55° | 2262 | 2137 | 2096 |
| 60° | 2149 | 2008 | 1977 |
| 65° | 2025 | 1874 | 1836 |
| 70° | 1868 | 1710 | 1684 |
| 75° | 1650 | 1513 | 1543 |
| 80° | 1387 | 1262 | 1275 |
| 85° | 976  | 836  | 835  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 90°

Vertical Angle: 90°

Luminance: 2469 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 243.7   | 1.8       |
| 10°-20°   | 685.6   | 5.1       |
| 20°-30°   | 1007.6  | 7.5       |
| 30°-40°   | 1170.3  | 8.7       |
| 40°-50°   | 1168.8  | 8.7       |
| 50°-60°   | 1019.2  | 7.6       |
| 60°-70°   | 753.4   | 5.6       |
| 70°-80°   | 426.3   | 3.2       |
| 80°-90°   | 119.5   | 0.9       |
| 90°-100°  | 151.9   | 1.1       |
| 100°-110° | 482.7   | 3.6       |
| 110°-120° | 826.1   | 6.1       |
| 120°-130° | 1086.4  | 8.1       |
| 130°-140° | 1219.5  | 9.1       |
| 140°-150° | 1195.8  | 8.9       |
| 150°-160° | 1003.1  | 7.5       |
| 160°-170° | 665.3   | 4.9       |
| 170°-180° | 232.5   | 1.7       |
| 0°-30°    | 1937.0  | 14.4      |
| 0°-40°    | 3107.2  | 23.1      |
| 0°-60°    | 5295.3  | 39.3      |
| 0°-90°    | 6594.4  | 49.0      |
| 90°-120°  | 1460.7  | 10.9      |
| 90°-150°  | 4962.4  | 36.9      |
| 90°-180°  | 6863.0  | 51.0      |
| 0°-180°   | 13457.7 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 2589 | 2589  | 2589 | 2589  | 2589 |      |
| 5°   | 2589 | 2579  | 2552 | 2572  | 2567 | 246  |
| 15°  | 2465 | 2450  | 2417 | 2428  | 2415 | 694  |
| 25°  | 2231 | 2211  | 2168 | 2173  | 2168 | 1026 |
| 35°  | 1925 | 1900  | 1860 | 1845  | 1832 | 1202 |
| 45°  | 1566 | 1549  | 1511 | 1484  | 1474 | 1209 |
| 55°  | 1185 | 1170  | 1140 | 1110  | 1098 | 1060 |
| 65°  | 799  | 784   | 759  | 737   | 724  | 790  |
| 75°  | 418  | 413   | 401  | 386   | 391  | 446  |
| 85°  | 102  | 100   | 97   | 90    | 87   | 114  |
| 90°  | 2    | 27    | 72   | 68    | 70   | 13   |
| 95°  | 108  | 129   | 132  | 132   | 129  | 120  |
| 105° | 446  | 452   | 456  | 460   | 460  | 470  |
| 115° | 829  | 841   | 837  | 835   | 829  | 820  |
| 125° | 1206 | 1224  | 1218 | 1212  | 1210 | 1077 |
| 135° | 1560 | 1582  | 1587 | 1585  | 1579 | 1205 |
| 145° | 1893 | 1908  | 1920 | 1922  | 1914 | 1183 |
| 155° | 2165 | 2171  | 2178 | 2188  | 2181 | 997  |
| 165° | 2355 | 2353  | 2353 | 2368  | 2357 | 664  |
| 175° | 2451 | 2445  | 2440 | 2455  | 2443 | 233  |
| 180° | 2455 | 2455  | 2455 | 2455  | 2455 |      |

TEST NUMBER: P911880

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 2589.1 | 2589.1 | 2589.1 | 2589.1 | 2589.1 |
| 2.5°   | 2604.2 | 2591.7 | 2564.2 | 2589.1 | 2584.3 |
| 5°     | 2589.1 | 2579.3 | 2551.8 | 2571.7 | 2566.9 |
| 7.5°   | 2571.7 | 2556.9 | 2529.4 | 2549.5 | 2544.5 |
| 10°    | 2544.5 | 2527.1 | 2497.1 | 2517.0 | 2509.6 |
| 12.5°  | 2507.0 | 2492.1 | 2462.3 | 2474.7 | 2469.7 |
| 15°    | 2464.6 | 2449.9 | 2417.4 | 2427.5 | 2415.1 |
| 17.5°  | 2412.4 | 2397.7 | 2365.2 | 2377.5 | 2365.2 |
| 20°    | 2355.1 | 2340.3 | 2305.4 | 2312.8 | 2303.1 |
| 22.5°  | 2298.1 | 2275.6 | 2243.1 | 2243.1 | 2238.1 |
| 25°    | 2230.6 | 2210.9 | 2168.5 | 2173.3 | 2168.5 |
| 27.5°  | 2155.9 | 2138.5 | 2106.2 | 2098.9 | 2086.5 |
| 30°    | 2081.5 | 2061.3 | 2024.1 | 2016.7 | 2006.6 |
| 32.5°  | 2001.6 | 1986.9 | 1947.0 | 1931.9 | 1921.9 |
| 35°    | 1924.6 | 1899.7 | 1859.8 | 1844.7 | 1832.3 |
| 37.5°  | 1837.4 | 1814.9 | 1775.1 | 1757.5 | 1745.1 |
| 40°    | 1747.8 | 1727.7 | 1687.9 | 1665.7 | 1655.6 |
| 42.5°  | 1660.6 | 1640.5 | 1601.0 | 1575.9 | 1561.0 |
| 45°    | 1566.1 | 1548.6 | 1511.1 | 1484.0 | 1473.9 |
| 47.5°  | 1473.9 | 1456.4 | 1416.6 | 1389.1 | 1374.3 |
| 50°    | 1376.7 | 1364.3 | 1329.5 | 1294.5 | 1282.1 |
| 52.5°  | 1282.1 | 1264.7 | 1232.4 | 1205.0 | 1187.6 |
| 55°    | 1185.2 | 1170.1 | 1140.3 | 1110.4 | 1098.0 |
| 57.5°  | 1088.0 | 1075.6 | 1043.1 | 1013.3 | 1003.2 |
| 60°    | 990.8  | 981.0  | 946.2  | 918.7  | 911.3  |
| 62.5°  | 896.2  | 878.8  | 853.9  | 829.1  | 819.1  |
| 65°    | 799.3  | 784.3  | 759.4  | 736.9  | 724.5  |
| 67.5°  | 699.7  | 687.0  | 664.8  | 647.4  | 637.3  |
| 70°    | 607.5  | 597.5  | 575.0  | 557.6  | 547.8  |
| 72.5°  | 512.9  | 502.9  | 490.5  | 473.1  | 465.7  |
| 75°    | 418.1  | 413.4  | 400.7  | 385.9  | 390.9  |
| 77.5°  | 333.6  | 323.6  | 318.5  | 311.2  | 303.8  |
| 80°    | 249.1  | 246.4  | 241.4  | 234.0  | 229.0  |
| 82.5°  | 169.3  | 169.3  | 166.9  | 156.9  | 156.9  |
| 85°    | 101.9  | 99.6   | 97.1   | 89.5   | 87.2   |
| 87.5°  | 44.9   | 39.9   | 34.8   | 27.5   | 24.8   |
| 90°    | 2.2    | 26.6   | 72.5   | 68.1   | 70.3   |
| 92.5°  | 45.9   | 62.2   | 64.4   | 66.7   | 66.7   |
| 95°    | 108.0  | 128.8  | 132.5  | 132.5  | 128.8  |
| 97.5°  | 179.9  | 199.1  | 207.3  | 207.3  | 207.3  |
| 100°   | 262.7  | 279.8  | 285.7  | 285.7  | 283.5  |
| 102.5° | 350.1  | 362.6  | 370.8  | 373.1  | 370.8  |
| 105°   | 445.6  | 451.5  | 455.9  | 459.7  | 459.7  |
| 107.5° | 540.3  | 549.2  | 549.2  | 550.7  | 540.3  |
| 110°   | 632.1  | 644.0  | 644.0  | 644.0  | 638.0  |



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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 731.3  | 743.9  | 741.7  | 735.7  | 731.3  |
| 115°   | 829.0  | 840.8  | 837.2  | 835.0  | 829.0  |
| 117.5° | 925.9  | 942.2  | 931.9  | 925.9  | 920.0  |
| 120°   | 1023.6 | 1039.9 | 1023.6 | 1023.6 | 1017.0 |
| 122.5° | 1112.4 | 1133.2 | 1122.9 | 1116.9 | 1112.4 |
| 125°   | 1205.7 | 1224.2 | 1218.3 | 1211.7 | 1209.5 |
| 127.5° | 1296.8 | 1319.7 | 1311.6 | 1302.7 | 1296.8 |
| 130°   | 1381.9 | 1408.5 | 1404.9 | 1400.4 | 1392.2 |
| 132.5° | 1477.4 | 1498.1 | 1499.6 | 1489.3 | 1483.3 |
| 135°   | 1559.6 | 1582.4 | 1587.0 | 1584.7 | 1578.8 |
| 137.5° | 1651.3 | 1669.8 | 1673.5 | 1672.0 | 1663.2 |
| 140°   | 1732.0 | 1750.6 | 1760.9 | 1760.9 | 1752.8 |
| 142.5° | 1814.9 | 1833.4 | 1839.3 | 1841.5 | 1833.4 |
| 145°   | 1893.4 | 1908.1 | 1920.0 | 1922.2 | 1914.1 |
| 147.5° | 1963.7 | 1982.2 | 1991.1 | 1994.8 | 1986.7 |
| 150°   | 2036.2 | 2048.8 | 2057.0 | 2063.6 | 2057.0 |
| 152.5° | 2100.6 | 2113.2 | 2123.5 | 2131.7 | 2123.5 |
| 155°   | 2165.0 | 2170.9 | 2177.6 | 2187.9 | 2181.3 |
| 157.5° | 2220.6 | 2225.0 | 2228.6 | 2243.5 | 2233.1 |
| 160°   | 2270.1 | 2274.6 | 2276.8 | 2289.3 | 2280.4 |
| 162.5° | 2316.0 | 2316.0 | 2318.3 | 2332.2 | 2321.9 |
| 165°   | 2355.2 | 2353.0 | 2353.0 | 2367.8 | 2357.4 |
| 167.5° | 2390.8 | 2384.1 | 2384.1 | 2398.9 | 2388.6 |
| 170°   | 2417.4 | 2411.5 | 2409.3 | 2424.1 | 2411.5 |
| 172.5° | 2435.9 | 2429.9 | 2427.7 | 2442.6 | 2429.9 |
| 175°   | 2450.7 | 2444.8 | 2440.4 | 2455.1 | 2442.6 |
| 177.5° | 2458.9 | 2452.9 | 2448.5 | 2461.1 | 2448.5 |
| 180°   | 2455.1 | 2455.1 | 2455.1 | 2455.1 | 2455.1 |

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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 | 10.92            | 11.77 | 11.89 | 12.75 | 14.04 | 10.48          | 11.33 | 11.44 | 12.31 | 13.60 |
|                 | 3H   | 12.58            | 13.34 | 13.55 | 14.33 | 15.64 | 12.09          | 12.85 | 13.06 | 13.84 | 15.15 |
|                 | 4H   | 13.16            | 13.88 | 14.15 | 14.88 | 16.19 | 12.67          | 13.39 | 13.66 | 14.38 | 15.70 |
|                 | 6H   | 13.56            | 14.22 | 14.56 | 15.22 | 16.55 | 13.06          | 13.72 | 14.06 | 14.72 | 16.05 |
|                 | 8H   | 13.66            | 14.29 | 14.67 | 15.31 | 16.63 | 13.16          | 13.79 | 14.16 | 14.81 | 16.13 |
|                 | 12H  | 13.71            | 14.31 | 14.72 | 15.32 | 16.67 | 13.20          | 13.80 | 14.21 | 14.81 | 16.16 |
| 4H              | 2H   | 11.38            | 12.10 | 12.37 | 13.09 | 14.41 | 11.02          | 11.75 | 12.02 | 12.74 | 14.06 |
|                 | 3H   | 13.24            | 13.84 | 14.24 | 14.86 | 16.19 | 12.83          | 13.43 | 13.83 | 14.46 | 15.78 |
|                 | 4H   | 13.95            | 14.50 | 14.96 | 15.51 | 16.87 | 13.52          | 14.08 | 14.54 | 15.09 | 16.44 |
|                 | 6H   | 14.46            | 14.93 | 15.48 | 15.97 | 17.32 | 14.03          | 14.50 | 15.05 | 15.54 | 16.89 |
|                 | 8H   | 14.60            | 15.05 | 15.63 | 16.08 | 17.44 | 14.17          | 14.61 | 15.19 | 15.64 | 17.01 |
|                 | 12H  | 14.67            | 15.08 | 15.72 | 16.12 | 17.49 | 14.23          | 14.63 | 15.27 | 15.67 | 17.04 |
| 8H              | 4H   | 14.14            | 14.58 | 15.16 | 15.61 | 16.98 | 13.76          | 14.21 | 14.79 | 15.24 | 16.60 |
|                 | 6H   | 14.76            | 15.13 | 15.81 | 16.20 | 17.57 | 14.38          | 14.75 | 15.43 | 15.82 | 17.18 |
|                 | 8H   | 14.98            | 15.30 | 16.04 | 16.36 | 17.74 | 14.59          | 14.91 | 15.65 | 15.97 | 17.35 |
|                 | 12H  | 15.11            | 15.39 | 16.17 | 16.45 | 17.87 | 14.70          | 14.98 | 15.76 | 16.04 | 17.46 |
| 12H             | 4H   | 14.12            | 14.52 | 15.17 | 15.57 | 16.94 | 13.75          | 14.16 | 14.80 | 15.20 | 16.57 |
|                 | 6H   | 14.79            | 15.12 | 15.85 | 16.17 | 17.55 | 14.42          | 14.74 | 15.48 | 15.80 | 17.18 |
|                 | 8H   | 15.03            | 15.31 | 16.09 | 16.37 | 17.79 | 14.65          | 14.93 | 15.71 | 15.99 | 17.41 |