

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: P911766

Luminaire Tested: DFN2DIP-SQ2F0-070D070US850-RLLFLL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P911766  
REPORT IS A COMBINATION OF REPORTS P899828 AND P896659  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-SQ2F0-070D070US850-RLLFLL  
Description: 2 foot, Square Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

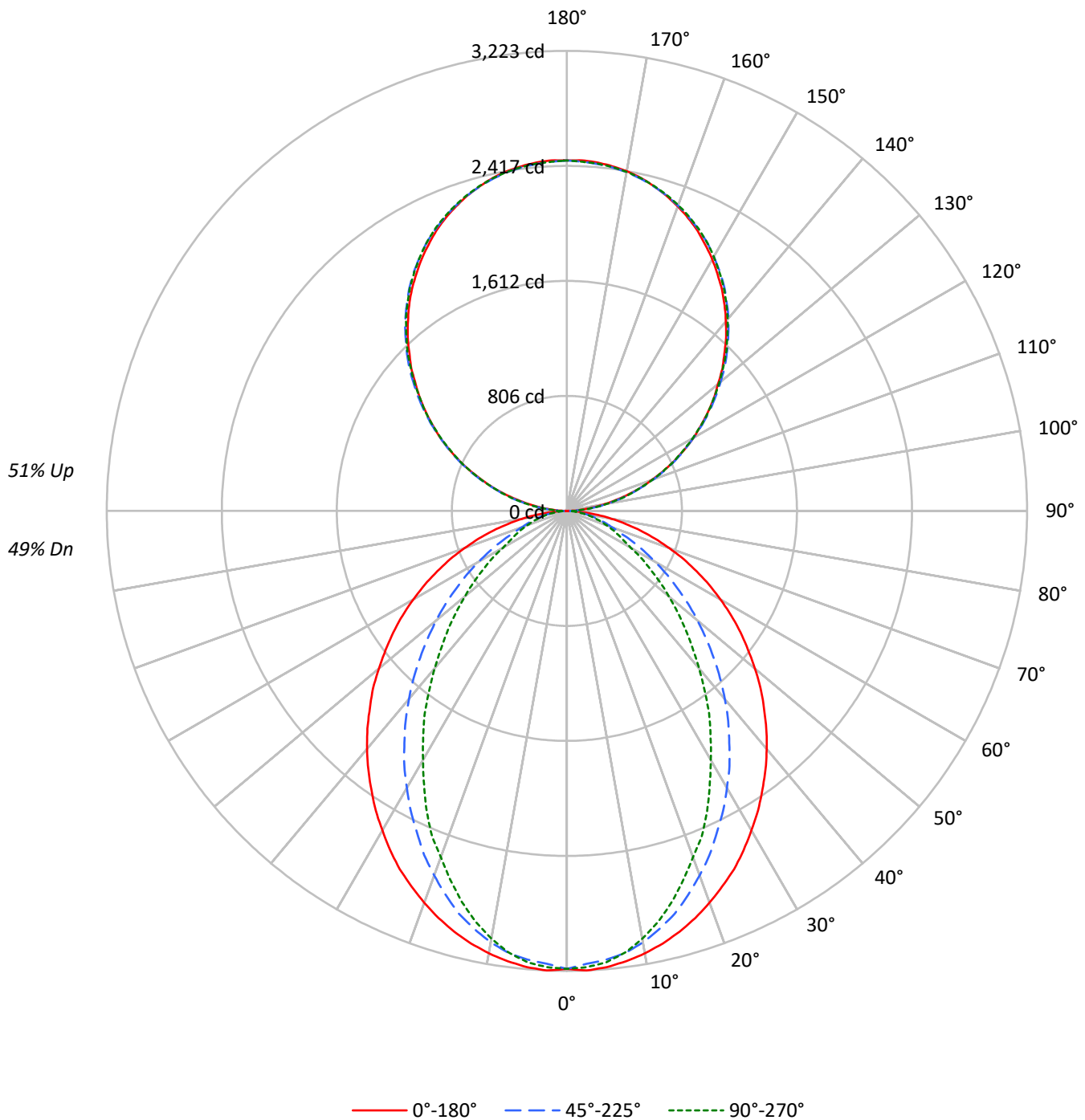
Lumens per Lamp: N/A  
Luminaire Lumens: 13468.8 lumens  
Efficiency: N/A  
Efficacy: 110.2 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 0.99 / 1.16  
Luminous Opening: Rectangular w/ Sides (W: 2.21' x L: 2.21' x H: 0.1')  
CIE Type: General Diffuse

Input Watts (W): 122.2  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9977  
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: P911766

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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 | 99 | 99 | 99 | 99 | 83 | 83 | 83 | 68 | 68 | 68 | 55 | 55 | 55 |
| 1   | 98  | 94  | 90  | 87  | 90 | 87 | 84 | 81 | 73 | 71 | 69 | 61 | 59 | 58 | 50 | 49 | 48 |
| 2   | 90  | 83  | 77  | 72  | 82 | 76 | 71 | 67 | 65 | 61 | 58 | 54 | 51 | 49 | 44 | 42 | 41 |
| 3   | 82  | 73  | 66  | 60  | 75 | 68 | 61 | 57 | 58 | 53 | 49 | 48 | 45 | 42 | 40 | 37 | 35 |
| 4   | 75  | 65  | 57  | 51  | 69 | 60 | 54 | 48 | 51 | 46 | 42 | 43 | 40 | 36 | 36 | 33 | 31 |
| 5   | 69  | 58  | 50  | 44  | 64 | 54 | 47 | 42 | 46 | 41 | 37 | 39 | 35 | 32 | 32 | 29 | 27 |
| 6   | 64  | 52  | 44  | 39  | 59 | 49 | 42 | 37 | 42 | 36 | 32 | 35 | 31 | 28 | 30 | 26 | 24 |
| 7   | 59  | 47  | 40  | 34  | 55 | 44 | 37 | 32 | 38 | 33 | 29 | 32 | 28 | 25 | 27 | 24 | 22 |
| 8   | 55  | 43  | 36  | 30  | 51 | 40 | 33 | 29 | 35 | 29 | 26 | 30 | 26 | 23 | 25 | 22 | 20 |
| 9   | 51  | 39  | 32  | 27  | 47 | 37 | 30 | 26 | 32 | 27 | 23 | 27 | 23 | 20 | 23 | 20 | 18 |
| 10  | 48  | 36  | 29  | 24  | 44 | 34 | 28 | 23 | 30 | 24 | 21 | 25 | 21 | 19 | 22 | 18 | 16 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 7055 | 7055 | 7055 |
| 5°  | 7054 | 6928 | 6977 |
| 10° | 6972 | 6777 | 6741 |
| 15° | 6864 | 6538 | 6381 |
| 20° | 6725 | 6215 | 5942 |
| 25° | 6582 | 5856 | 5519 |
| 30° | 6395 | 5489 | 4986 |
| 35° | 6210 | 5096 | 4518 |
| 40° | 6022 | 4690 | 3983 |
| 45° | 5806 | 4244 | 3499 |
| 50° | 5580 | 3793 | 3026 |
| 55° | 5343 | 3314 | 2573 |
| 60° | 5068 | 2816 | 2108 |
| 65° | 4752 | 2312 | 1886 |
| 70° | 4368 | 1841 | 1693 |
| 75° | 3883 | 1593 | 1521 |
| 80° | 3189 | 1295 | 1289 |
| 85° | 2076 | 803  | 917  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 5806 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 300.7   | 2.2       |
| 10°-20°   | 825.5   | 6.1       |
| 20°-30°   | 1158.9  | 8.6       |
| 30°-40°   | 1263.3  | 9.4       |
| 40°-50°   | 1161.1  | 8.6       |
| 50°-60°   | 911.9   | 6.8       |
| 60°-70°   | 593.5   | 4.4       |
| 70°-80°   | 305.5   | 2.3       |
| 80°-90°   | 85.0    | 0.6       |
| 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  | 7.4       |
| 160°-170° | 665.3   | 4.9       |
| 170°-180° | 232.5   | 1.7       |
| 0°-30°    | 2285.1  | 17.0      |
| 0°-40°    | 3548.4  | 26.3      |
| 0°-60°    | 5621.4  | 41.7      |
| 0°-90°    | 6605.5  | 49.0      |
| 90°-120°  | 1460.7  | 10.8      |
| 90°-150°  | 4962.4  | 36.8      |
| 90°-180°  | 6863.0  | 51.0      |
| 0°-180°   | 13468.8 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 3208 | 3208  | 3208 | 3208  | 3208 |      |
| 5°   | 3208 | 3194  | 3156 | 3182  | 3174 | 304  |
| 15°  | 3052 | 3020  | 2921 | 2866  | 2837 | 860  |
| 25°  | 2770 | 2677  | 2485 | 2366  | 2323 | 1274 |
| 35°  | 2387 | 2239  | 1983 | 1800  | 1736 | 1494 |
| 45°  | 1951 | 1756  | 1452 | 1246  | 1176 | 1507 |
| 55°  | 1484 | 1257  | 944  | 770   | 714  | 1326 |
| 65°  | 1002 | 766   | 505  | 407   | 398  | 993  |
| 75°  | 534  | 331   | 232  | 212   | 209  | 565  |
| 85°  | 125  | 64    | 55   | 55    | 55   | 143  |
| 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 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 3208.4 | 3208.4 | 3208.4 | 3208.4 | 3208.4 |
| 2.5°   | 3222.9 | 3208.4 | 3176.4 | 3205.7 | 3199.8 |
| 5°     | 3208.4 | 3193.9 | 3156.1 | 3182.3 | 3173.6 |
| 7.5°   | 3182.3 | 3165.0 | 3124.4 | 3135.7 | 3121.3 |
| 10°    | 3147.5 | 3127.2 | 3069.2 | 3060.3 | 3043.0 |
| 12.5°  | 3104.0 | 3077.8 | 2999.3 | 2982.0 | 2949.9 |
| 15°    | 3051.6 | 3019.6 | 2921.0 | 2865.9 | 2836.9 |
| 17.5°  | 2990.6 | 2944.2 | 2822.2 | 2758.3 | 2711.8 |
| 20°    | 2921.0 | 2862.8 | 2717.7 | 2645.3 | 2581.2 |
| 22.5°  | 2845.6 | 2778.7 | 2610.1 | 2511.6 | 2468.2 |
| 25°    | 2770.1 | 2677.0 | 2485.4 | 2366.5 | 2322.8 |
| 27.5°  | 2680.1 | 2581.2 | 2369.3 | 2232.9 | 2166.0 |
| 30°    | 2584.3 | 2473.7 | 2241.4 | 2093.6 | 2015.1 |
| 32.5°  | 2491.3 | 2357.6 | 2119.7 | 1945.4 | 1872.7 |
| 35°    | 2386.8 | 2238.6 | 1983.3 | 1800.4 | 1736.3 |
| 37.5°  | 2285.2 | 2125.3 | 1855.5 | 1654.8 | 1582.5 |
| 40°    | 2177.6 | 2003.6 | 1721.7 | 1515.7 | 1440.1 |
| 42.5°  | 2067.4 | 1881.6 | 1588.3 | 1373.3 | 1301.0 |
| 45°    | 1951.3 | 1756.5 | 1451.9 | 1245.5 | 1175.9 |
| 47.5°  | 1840.9 | 1634.9 | 1321.3 | 1114.9 | 1051.1 |
| 50°    | 1719.0 | 1512.9 | 1193.4 | 992.9  | 932.2  |
| 52.5°  | 1599.7 | 1381.9 | 1071.4 | 879.8  | 824.7  |
| 55°    | 1483.6 | 1257.2 | 943.5  | 769.5  | 714.4  |
| 57.5°  | 1364.7 | 1132.4 | 830.5  | 667.8  | 621.4  |
| 60°    | 1242.7 | 1010.4 | 711.3  | 563.5  | 516.9  |
| 62.5°  | 1123.7 | 891.5  | 609.6  | 470.4  | 447.3  |
| 65°    | 1001.8 | 766.4  | 505.3  | 406.7  | 397.7  |
| 67.5°  | 885.6  | 650.3  | 406.7  | 357.0  | 348.4  |
| 70°    | 763.7  | 537.2  | 336.7  | 307.7  | 296.0  |
| 72.5°  | 647.5  | 432.5  | 281.6  | 258.5  | 252.6  |
| 75°    | 534.2  | 330.8  | 232.2  | 211.9  | 209.2  |
| 77.5°  | 421.1  | 235.0  | 183.0  | 171.2  | 165.5  |
| 80°    | 316.4  | 168.5  | 139.3  | 127.9  | 127.9  |
| 82.5°  | 220.6  | 113.3  | 95.8   | 89.9   | 89.9   |
| 85°    | 124.8  | 63.8   | 55.1   | 55.1   | 55.1   |
| 87.5°  | 46.5   | 23.1   | 23.1   | 20.3   | 20.3   |
| 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 | 13.73            | 14.55 | 14.70 | 15.53 | 16.82 | 9.69           | 10.51 | 10.66 | 11.49 | 12.78 |
|                 | 3H   | 15.39            | 16.12 | 16.37 | 17.11 | 18.42 | 10.86          | 11.59 | 11.84 | 12.58 | 13.89 |
|                 | 4H   | 15.98            | 16.68 | 16.98 | 17.67 | 18.99 | 11.30          | 11.99 | 12.29 | 12.98 | 14.30 |
|                 | 6H   | 16.39            | 17.03 | 17.39 | 18.02 | 19.35 | 11.60          | 12.24 | 12.61 | 13.24 | 14.57 |
|                 | 8H   | 16.50            | 17.11 | 17.52 | 18.13 | 19.45 | 11.68          | 12.29 | 12.69 | 13.31 | 14.63 |
|                 | 12H  | 16.56            | 17.14 | 17.57 | 18.14 | 19.50 | 11.72          | 12.30 | 12.73 | 13.30 | 14.65 |
| 4H              | 2H   | 13.74            | 14.44 | 14.74 | 15.43 | 16.75 | 10.27          | 10.97 | 11.28 | 11.96 | 13.28 |
|                 | 3H   | 15.55            | 16.12 | 16.56 | 17.15 | 18.48 | 11.60          | 12.18 | 12.61 | 13.20 | 14.53 |
|                 | 4H   | 16.22            | 16.75 | 17.24 | 17.77 | 19.12 | 12.13          | 12.66 | 13.15 | 13.68 | 15.03 |
|                 | 6H   | 16.72            | 17.17 | 17.75 | 18.21 | 19.56 | 12.53          | 12.99 | 13.56 | 14.03 | 15.38 |
|                 | 8H   | 16.88            | 17.31 | 17.91 | 18.34 | 19.70 | 12.65          | 13.07 | 13.68 | 14.11 | 15.47 |
|                 | 12H  | 16.97            | 17.35 | 18.02 | 18.40 | 19.77 | 12.70          | 13.09 | 13.75 | 14.13 | 15.50 |
| 8H              | 4H   | 16.19            | 16.61 | 17.22 | 17.64 | 19.01 | 12.40          | 12.82 | 13.43 | 13.86 | 15.22 |
|                 | 6H   | 16.73            | 17.08 | 17.78 | 18.15 | 19.52 | 12.89          | 13.24 | 13.95 | 14.32 | 15.68 |
|                 | 8H   | 16.93            | 17.24 | 18.00 | 18.30 | 19.68 | 13.07          | 13.38 | 14.13 | 14.44 | 15.82 |
|                 | 12H  | 17.06            | 17.33 | 18.12 | 18.38 | 19.81 | 13.17          | 13.45 | 14.24 | 14.50 | 15.92 |
| 12H             | 4H   | 16.14            | 16.52 | 17.18 | 17.57 | 18.94 | 12.40          | 12.78 | 13.45 | 13.83 | 15.20 |
|                 | 6H   | 16.70            | 17.01 | 17.77 | 18.07 | 19.45 | 12.94          | 13.25 | 14.00 | 14.30 | 15.69 |
|                 | 8H   | 16.91            | 17.18 | 17.97 | 18.23 | 19.66 | 13.13          | 13.40 | 14.20 | 14.46 | 15.88 |