

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: P912212

Luminaire Tested: DFN2DIP-SQ4F0-080D110US850-FLLFLL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P912212  
REPORT IS A COMBINATION OF REPORTS P900153 AND P896915  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-SQ4F0-080D110US850-FLLFLL  
Description: 4 foot, Square Define Geo, with Direct Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

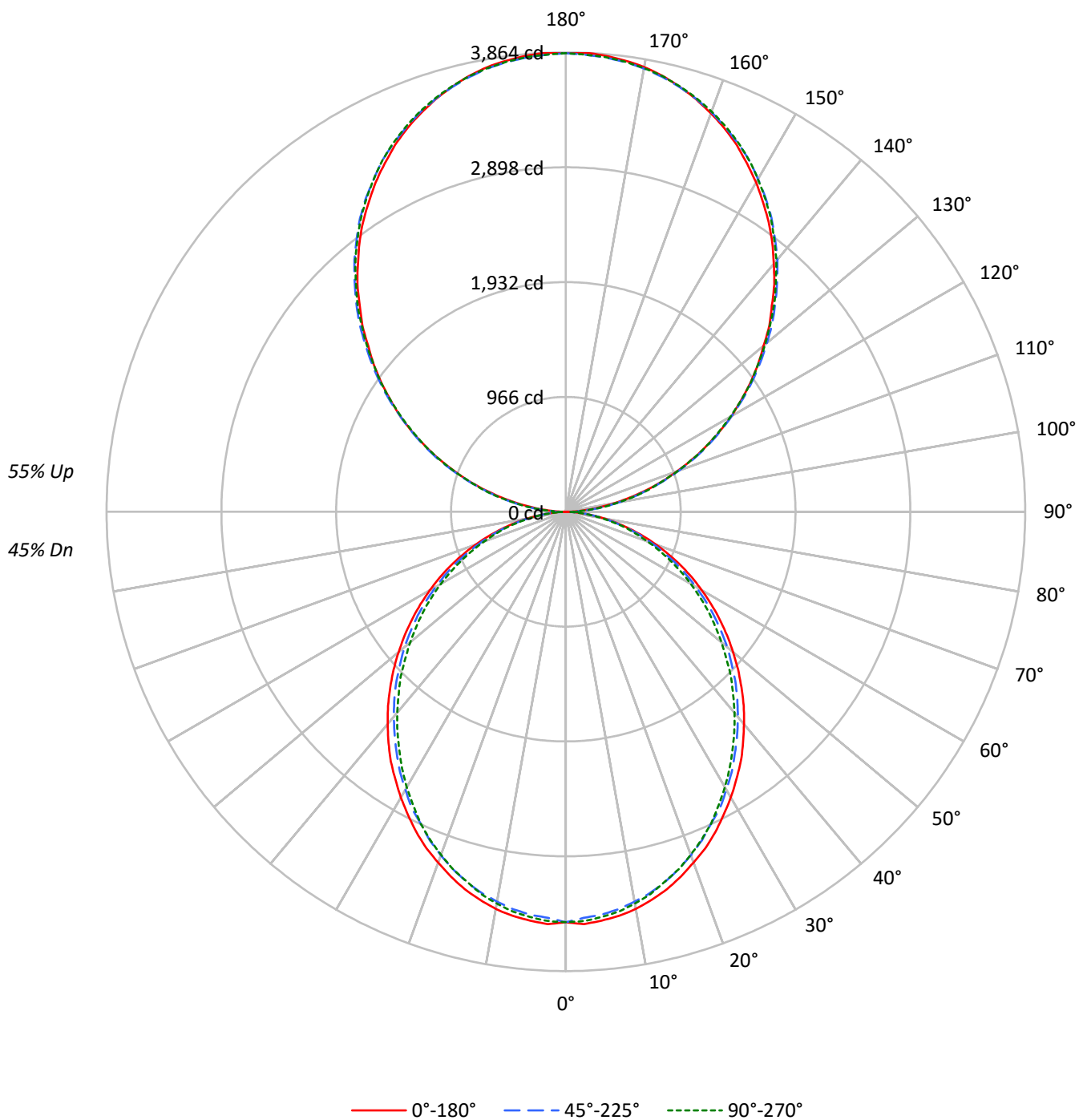
Lumens per Lamp: N/A  
Luminaire Lumens: 19579.4 lumens  
Efficiency: N/A  
Efficacy: 127.0 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 3.92' x L: 3.92' x H: 0.1')  
CIE Type: General Diffuse

Input Watts (W): 154.2  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9954  
Total Harmonic Distortion (THDi): 0.076  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT

TEST NUMBER: P912212

CATALOG NUMBER: DFN2DIP-SQ4F0-080D110US850-FLLFLL

### Luminous Intensity Polar Plot



TEST NUMBER: P912212

CATALOG NUMBER: DFN2DIP-SQ4F0-080D110US850-FLLFL

**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   | 106 | 106 | 106 | 106 | 97 | 97 | 97 | 97 | 81 | 81 | 81 | 65 | 65 | 65 | 51 | 51 | 51 |
| 1   | 97  | 92  | 88  | 85  | 88 | 85 | 81 | 78 | 71 | 68 | 66 | 57 | 56 | 54 | 45 | 44 | 43 |
| 2   | 88  | 81  | 75  | 69  | 80 | 74 | 69 | 64 | 62 | 58 | 55 | 50 | 48 | 45 | 40 | 38 | 37 |
| 3   | 80  | 71  | 64  | 58  | 73 | 65 | 59 | 54 | 55 | 50 | 46 | 45 | 41 | 38 | 35 | 33 | 31 |
| 4   | 73  | 63  | 55  | 49  | 67 | 58 | 51 | 46 | 48 | 43 | 39 | 40 | 36 | 33 | 32 | 29 | 27 |
| 5   | 67  | 56  | 48  | 42  | 61 | 51 | 44 | 39 | 43 | 38 | 34 | 36 | 32 | 28 | 29 | 26 | 23 |
| 6   | 62  | 50  | 42  | 36  | 57 | 46 | 39 | 34 | 39 | 33 | 29 | 32 | 28 | 25 | 26 | 23 | 21 |
| 7   | 57  | 45  | 37  | 32  | 52 | 42 | 35 | 30 | 35 | 30 | 26 | 29 | 25 | 22 | 24 | 21 | 18 |
| 8   | 53  | 41  | 33  | 28  | 49 | 38 | 31 | 26 | 32 | 27 | 23 | 27 | 23 | 20 | 22 | 19 | 16 |
| 9   | 49  | 37  | 30  | 25  | 45 | 35 | 28 | 23 | 29 | 24 | 21 | 25 | 21 | 18 | 20 | 17 | 15 |
| 10  | 46  | 34  | 27  | 22  | 42 | 32 | 25 | 21 | 27 | 22 | 18 | 23 | 19 | 16 | 19 | 16 | 13 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 2422 | 2422 | 2422 |
| 5°  | 2426 | 2389 | 2405 |
| 10° | 2406 | 2357 | 2373 |
| 15° | 2371 | 2319 | 2323 |
| 20° | 2323 | 2266 | 2272 |
| 25° | 2276 | 2202 | 2212 |
| 30° | 2216 | 2142 | 2136 |
| 35° | 2159 | 2072 | 2056 |
| 40° | 2090 | 2001 | 1980 |
| 45° | 2020 | 1930 | 1902 |
| 50° | 1945 | 1855 | 1811 |
| 55° | 1865 | 1769 | 1728 |
| 60° | 1775 | 1666 | 1633 |
| 65° | 1678 | 1560 | 1521 |
| 70° | 1553 | 1431 | 1400 |
| 75° | 1380 | 1277 | 1290 |
| 80° | 1172 | 1080 | 1078 |
| 85° | 848  | 739  | 724  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 90°

Vertical Angle: 90°

Luminance: 3037 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 324.9   | 1.7       |
| 10°-20°   | 914.2   | 4.7       |
| 20°-30°   | 1343.5  | 6.9       |
| 30°-40°   | 1560.4  | 8.0       |
| 40°-50°   | 1558.4  | 8.0       |
| 50°-60°   | 1358.9  | 6.9       |
| 60°-70°   | 1004.5  | 5.1       |
| 70°-80°   | 568.4   | 2.9       |
| 80°-90°   | 161.0   | 0.8       |
| 90°-100°  | 238.7   | 1.2       |
| 100°-110° | 758.6   | 3.9       |
| 110°-120° | 1298.1  | 6.6       |
| 120°-130° | 1707.2  | 8.7       |
| 130°-140° | 1916.3  | 9.8       |
| 140°-150° | 1879.1  | 9.6       |
| 150°-160° | 1576.3  | 8.1       |
| 160°-170° | 1045.4  | 5.3       |
| 170°-180° | 365.4   | 1.9       |
| 0°-30°    | 2582.6  | 13.2      |
| 0°-40°    | 4143.0  | 21.2      |
| 0°-60°    | 7060.4  | 36.1      |
| 0°-90°    | 8794.2  | 44.9      |
| 90°-120°  | 2295.4  | 11.7      |
| 90°-150°  | 7798.0  | 39.8      |
| 90°-180°  | 10785.0 | 55.1      |
| 0°-180°   | 19579.4 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 3452 | 3452  | 3452 | 3452  | 3452 |      |
| 5°   | 3452 | 3439  | 3402 | 3429  | 3423 | 328  |
| 15°  | 3286 | 3267  | 3223 | 3237  | 3220 | 926  |
| 25°  | 2974 | 2948  | 2892 | 2898  | 2892 | 1369 |
| 35°  | 2566 | 2533  | 2480 | 2460  | 2443 | 1602 |
| 45°  | 2088 | 2065  | 2015 | 1979  | 1965 | 1612 |
| 55°  | 1580 | 1560  | 1520 | 1481  | 1464 | 1413 |
| 65°  | 1066 | 1046  | 1012 | 983   | 966  | 1054 |
| 75°  | 558  | 551   | 534  | 515   | 521  | 595  |
| 85°  | 136  | 133   | 130  | 119   | 116  | 152  |
| 90°  | 3    | 42    | 114  | 107   | 110  | 19   |
| 95°  | 170  | 202   | 208  | 208   | 202  | 189  |
| 105° | 700  | 710   | 716  | 722   | 722  | 739  |
| 115° | 1303 | 1321  | 1316 | 1312  | 1303 | 1288 |
| 125° | 1895 | 1924  | 1914 | 1904  | 1900 | 1693 |
| 135° | 2451 | 2487  | 2494 | 2490  | 2481 | 1894 |
| 145° | 2975 | 2998  | 3017 | 3021  | 3008 | 1859 |
| 155° | 3402 | 3411  | 3422 | 3438  | 3428 | 1566 |
| 165° | 3701 | 3698  | 3698 | 3721  | 3704 | 1044 |
| 175° | 3851 | 3842  | 3835 | 3858  | 3838 | 366  |
| 180° | 3858 | 3858  | 3858 | 3858  | 3858 |      |

TEST NUMBER: P912212

CATALOG NUMBER: DFN2DIP-SQ4F0-080D110US850-FLLFLL

**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 3452.1 | 3452.1 | 3452.1 | 3452.1 | 3452.1 |
| 2.5°   | 3472.2 | 3455.6 | 3419.0 | 3452.1 | 3445.8 |
| 5°     | 3452.1 | 3439.1 | 3402.5 | 3428.9 | 3422.6 |
| 7.5°   | 3428.9 | 3409.2 | 3372.6 | 3399.3 | 3392.7 |
| 10°    | 3392.7 | 3369.4 | 3329.6 | 3355.9 | 3346.2 |
| 12.5°  | 3342.6 | 3322.9 | 3283.1 | 3299.6 | 3293.0 |
| 15°    | 3286.3 | 3266.6 | 3223.2 | 3236.6 | 3220.1 |
| 17.5°  | 3216.5 | 3196.8 | 3153.4 | 3170.1 | 3153.4 |
| 20°    | 3140.1 | 3120.4 | 3073.9 | 3083.8 | 3070.7 |
| 22.5°  | 3064.1 | 3034.1 | 2990.8 | 2990.8 | 2984.1 |
| 25°    | 2974.2 | 2947.8 | 2891.5 | 2897.8 | 2891.5 |
| 27.5°  | 2874.5 | 2851.3 | 2808.3 | 2798.5 | 2781.9 |
| 30°    | 2775.3 | 2748.4 | 2698.9 | 2689.0 | 2675.6 |
| 32.5°  | 2668.9 | 2649.2 | 2595.9 | 2575.9 | 2562.6 |
| 35°    | 2566.0 | 2533.0 | 2479.7 | 2459.7 | 2443.1 |
| 37.5°  | 2449.8 | 2419.8 | 2366.7 | 2343.4 | 2326.9 |
| 40°    | 2330.5 | 2303.6 | 2250.5 | 2220.9 | 2207.5 |
| 42.5°  | 2214.2 | 2187.4 | 2134.6 | 2101.1 | 2081.5 |
| 45°    | 2088.1 | 2064.8 | 2014.8 | 1978.6 | 1965.3 |
| 47.5°  | 1965.3 | 1942.0 | 1888.7 | 1852.1 | 1832.4 |
| 50°    | 1835.6 | 1819.1 | 1772.5 | 1726.0 | 1709.5 |
| 52.5°  | 1709.5 | 1686.2 | 1643.3 | 1606.7 | 1583.4 |
| 55°    | 1580.2 | 1560.1 | 1520.4 | 1480.6 | 1464.0 |
| 57.5°  | 1450.7 | 1434.2 | 1390.8 | 1351.0 | 1337.6 |
| 60°    | 1321.0 | 1308.1 | 1261.5 | 1224.9 | 1215.0 |
| 62.5°  | 1194.9 | 1171.8 | 1138.6 | 1105.6 | 1092.1 |
| 65°    | 1065.7 | 1045.7 | 1012.5 | 982.6  | 966.0  |
| 67.5°  | 932.9  | 916.0  | 886.4  | 863.2  | 849.8  |
| 70°    | 810.0  | 796.6  | 766.8  | 743.5  | 730.4  |
| 72.5°  | 683.9  | 670.6  | 654.0  | 630.8  | 620.9  |
| 75°    | 557.5  | 551.2  | 534.3  | 514.6  | 521.2  |
| 77.5°  | 444.8  | 431.4  | 424.7  | 414.9  | 405.0  |
| 80°    | 332.1  | 328.6  | 321.9  | 312.1  | 305.3  |
| 82.5°  | 225.8  | 225.8  | 222.6  | 209.2  | 209.2  |
| 85°    | 136.0  | 132.7  | 129.6  | 119.4  | 116.2  |
| 87.5°  | 59.9   | 53.2   | 46.5   | 36.6   | 33.2   |
| 90°    | 3.4    | 41.9   | 114.0  | 107.0  | 110.5  |
| 92.5°  | 72.1   | 97.7   | 101.1  | 104.7  | 104.7  |
| 95°    | 169.8  | 202.4  | 208.2  | 208.2  | 202.4  |
| 97.5°  | 282.7  | 312.8  | 325.7  | 325.7  | 325.7  |
| 100°   | 412.9  | 439.6  | 448.9  | 448.9  | 445.5  |
| 102.5° | 550.2  | 569.9  | 582.8  | 586.2  | 582.8  |
| 105°   | 700.2  | 709.5  | 716.5  | 722.3  | 722.3  |
| 107.5° | 849.1  | 863.0  | 863.0  | 865.4  | 849.1  |
| 110°   | 993.3  | 1012.0 | 1012.0 | 1012.0 | 1002.6 |

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CATALOG NUMBER: DFN2DIP-SQ4F0-080D110US850-FLLFLL

**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 1149.1 | 1168.9 | 1165.4 | 1156.1 | 1149.1 |
| 115°   | 1302.7 | 1321.3 | 1315.5 | 1312.1 | 1302.7 |
| 117.5° | 1455.1 | 1480.6 | 1464.3 | 1455.1 | 1445.8 |
| 120°   | 1608.6 | 1634.2 | 1608.6 | 1608.6 | 1598.2 |
| 122.5° | 1748.2 | 1780.7 | 1764.4 | 1755.1 | 1748.2 |
| 125°   | 1894.7 | 1923.8 | 1914.5 | 1904.0 | 1900.5 |
| 127.5° | 2037.8 | 2073.8 | 2061.1 | 2047.1 | 2037.8 |
| 130°   | 2171.5 | 2213.5 | 2207.6 | 2200.6 | 2187.8 |
| 132.5° | 2321.6 | 2354.2 | 2356.5 | 2340.2 | 2330.9 |
| 135°   | 2450.7 | 2486.7 | 2493.7 | 2490.3 | 2480.9 |
| 137.5° | 2594.9 | 2624.0 | 2629.8 | 2627.4 | 2613.6 |
| 140°   | 2721.7 | 2750.8 | 2767.1 | 2767.1 | 2754.3 |
| 142.5° | 2852.0 | 2881.1 | 2890.4 | 2893.8 | 2881.1 |
| 145°   | 2975.2 | 2998.5 | 3017.1 | 3020.6 | 3007.8 |
| 147.5° | 3085.8 | 3114.8 | 3128.8 | 3134.6 | 3121.8 |
| 150°   | 3199.8 | 3219.5 | 3232.3 | 3242.8 | 3232.3 |
| 152.5° | 3300.9 | 3320.7 | 3337.0 | 3349.8 | 3337.0 |
| 155°   | 3402.2 | 3411.4 | 3421.9 | 3438.2 | 3427.7 |
| 157.5° | 3489.4 | 3496.3 | 3502.1 | 3525.4 | 3509.1 |
| 160°   | 3567.3 | 3574.3 | 3577.7 | 3597.6 | 3583.6 |
| 162.5° | 3639.4 | 3639.4 | 3643.0 | 3665.0 | 3648.7 |
| 165°   | 3701.1 | 3697.5 | 3697.5 | 3720.8 | 3704.5 |
| 167.5° | 3756.8 | 3746.4 | 3746.4 | 3769.7 | 3753.4 |
| 170°   | 3798.8 | 3789.5 | 3786.0 | 3809.2 | 3789.5 |
| 172.5° | 3827.8 | 3818.5 | 3815.1 | 3838.4 | 3818.5 |
| 175°   | 3851.1 | 3841.8 | 3834.8 | 3858.1 | 3838.4 |
| 177.5° | 3863.9 | 3854.6 | 3847.6 | 3867.4 | 3847.6 |
| 180°   | 3858.1 | 3858.1 | 3858.1 | 3858.1 | 3858.1 |



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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 | 9.87             | 10.69 | 10.87 | 11.70 | 13.04 | 9.42           | 10.24 | 10.42 | 11.25 | 12.59 |
|                 | 3H   | 11.53            | 12.26 | 12.54 | 13.28 | 14.64 | 11.04          | 11.77 | 12.05 | 12.79 | 14.15 |
|                 | 4H   | 12.12            | 12.81 | 13.14 | 13.83 | 15.20 | 11.62          | 12.32 | 12.65 | 13.34 | 14.71 |
|                 | 6H   | 12.52            | 13.16 | 13.55 | 14.18 | 15.57 | 12.02          | 12.66 | 13.05 | 13.68 | 15.07 |
|                 | 8H   | 12.62            | 13.23 | 13.66 | 14.28 | 15.65 | 12.12          | 12.73 | 13.16 | 13.77 | 15.15 |
|                 | 12H  | 12.67            | 13.25 | 13.72 | 14.29 | 15.69 | 12.16          | 12.74 | 13.21 | 13.78 | 15.18 |
| 4H              | 2H   | 10.32            | 11.02 | 11.35 | 12.04 | 13.41 | 9.97           | 10.66 | 11.00 | 11.69 | 13.06 |
|                 | 3H   | 12.19            | 12.77 | 13.23 | 13.82 | 15.20 | 11.78          | 12.36 | 12.82 | 13.41 | 14.80 |
|                 | 4H   | 12.91            | 13.44 | 13.95 | 14.48 | 15.89 | 12.48          | 13.01 | 13.53 | 14.06 | 15.46 |
|                 | 6H   | 13.42            | 13.88 | 14.48 | 14.95 | 16.35 | 12.99          | 13.45 | 14.04 | 14.51 | 15.91 |
|                 | 8H   | 13.57            | 14.00 | 14.63 | 15.06 | 16.48 | 13.14          | 13.56 | 14.19 | 14.62 | 16.04 |
|                 | 12H  | 13.65            | 14.03 | 14.72 | 15.11 | 16.53 | 13.20          | 13.58 | 14.27 | 14.66 | 16.08 |
| 8H              | 4H   | 13.10            | 13.53 | 14.15 | 14.58 | 16.00 | 12.72          | 13.15 | 13.78 | 14.21 | 15.62 |
|                 | 6H   | 13.73            | 14.09 | 14.81 | 15.19 | 16.60 | 13.35          | 13.70 | 14.43 | 14.80 | 16.22 |
|                 | 8H   | 13.96            | 14.27 | 15.04 | 15.35 | 16.78 | 13.56          | 13.87 | 14.65 | 14.96 | 16.39 |
|                 | 12H  | 14.09            | 14.36 | 15.18 | 15.44 | 16.92 | 13.68          | 13.95 | 14.77 | 15.03 | 16.50 |
| 12H             | 4H   | 13.08            | 13.47 | 14.16 | 14.54 | 15.96 | 12.72          | 13.10 | 13.79 | 14.17 | 15.60 |
|                 | 6H   | 13.76            | 14.07 | 14.85 | 15.16 | 16.59 | 13.39          | 13.70 | 14.48 | 14.79 | 16.22 |
|                 | 8H   | 14.01            | 14.28 | 15.10 | 15.36 | 16.83 | 13.63          | 13.90 | 14.72 | 14.98 | 16.45 |