

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: P912358

Luminaire Tested: DFN2DIP-SQ4F0-120D110US850-RLLFLL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P912358  
REPORT IS A COMBINATION OF REPORTS P900162 AND P896915  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-SQ4F0-120D110US850-RLLFLL  
Description: 4 foot, Square Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

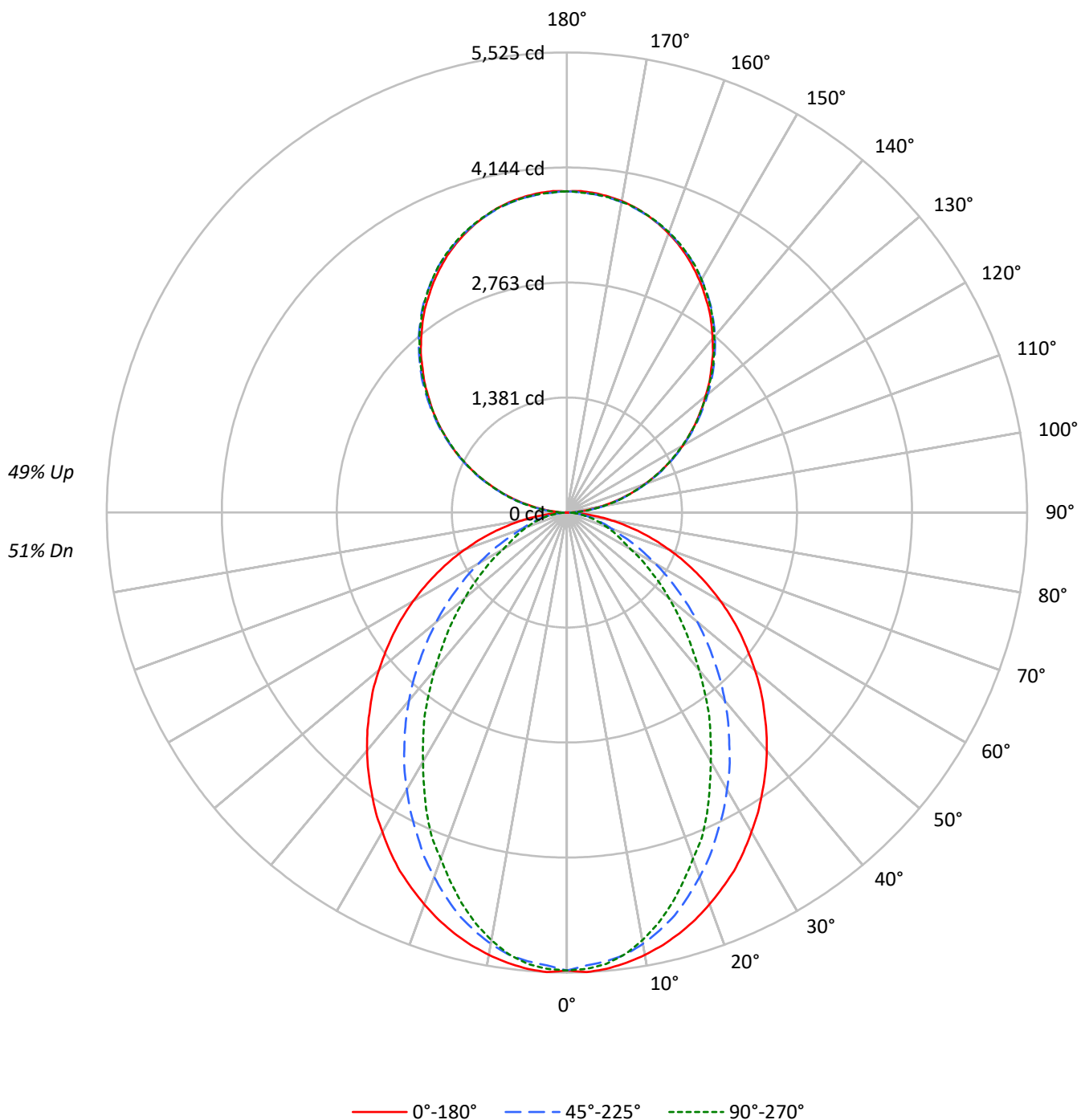
**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 22107.9 lumens  
Efficiency: N/A  
Efficacy: 110.3 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 0.99 / 1.16  
Luminous Opening: Rectangular w/ Sides (W: 3.92' x L: 3.92' x H: 0.1')  
CIE Type: General Diffuse  
  
Input Watts (W): 200.4  
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: P912358

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### Luminous Intensity Polar Plot



TEST NUMBER: P912358

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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 | 84 | 84 | 84 | 70 | 70 | 70 | 57 | 57 | 57 |
| 1   | 99  | 94  | 91  | 87  | 91 | 87 | 84 | 81 | 74 | 72 | 70 | 62 | 61 | 59 | 51 | 50 | 49 |
| 2   | 90  | 83  | 77  | 72  | 83 | 77 | 72 | 68 | 66 | 62 | 59 | 55 | 53 | 50 | 46 | 44 | 42 |
| 3   | 83  | 73  | 66  | 61  | 76 | 68 | 62 | 57 | 58 | 54 | 50 | 49 | 46 | 43 | 41 | 39 | 37 |
| 4   | 76  | 65  | 58  | 52  | 70 | 61 | 54 | 49 | 52 | 47 | 43 | 44 | 41 | 37 | 37 | 34 | 32 |
| 5   | 70  | 58  | 51  | 45  | 64 | 54 | 47 | 42 | 47 | 42 | 37 | 40 | 36 | 33 | 34 | 31 | 28 |
| 6   | 64  | 53  | 45  | 39  | 59 | 49 | 42 | 37 | 43 | 37 | 33 | 36 | 32 | 29 | 31 | 27 | 25 |
| 7   | 60  | 48  | 40  | 34  | 55 | 45 | 38 | 33 | 39 | 33 | 29 | 33 | 29 | 26 | 28 | 25 | 22 |
| 8   | 55  | 43  | 36  | 31  | 51 | 41 | 34 | 29 | 35 | 30 | 26 | 31 | 26 | 23 | 26 | 23 | 20 |
| 9   | 52  | 40  | 32  | 27  | 48 | 37 | 31 | 26 | 33 | 27 | 24 | 28 | 24 | 21 | 24 | 21 | 18 |
| 10  | 48  | 37  | 29  | 25  | 45 | 34 | 28 | 24 | 30 | 25 | 21 | 26 | 22 | 19 | 22 | 19 | 17 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 3859 | 3859 | 3859 |
| 5°  | 3865 | 3799 | 3824 |
| 10° | 3827 | 3725 | 3700 |
| 15° | 3774 | 3603 | 3509 |
| 20° | 3705 | 3434 | 3274 |
| 25° | 3633 | 3244 | 3047 |
| 30° | 3537 | 3050 | 2758 |
| 35° | 3443 | 2841 | 2505 |
| 40° | 3348 | 2624 | 2214 |
| 45° | 3237 | 2384 | 1950 |
| 50° | 3122 | 2141 | 1693 |
| 55° | 3002 | 1882 | 1446 |
| 60° | 2863 | 1610 | 1191 |
| 65° | 2703 | 1335 | 1073 |
| 70° | 2510 | 1077 | 973  |
| 75° | 2267 | 951  | 887  |
| 80° | 1915 | 801  | 773  |
| 85° | 1333 | 539  | 589  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 3237 cd/sqm

TEST NUMBER: P912358

CATALOG NUMBER: DFN2DIP-SQ4F0-120D110US850-RLFL

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 515.5   | 2.3       |
| 10°-20°   | 1415.1  | 6.4       |
| 20°-30°   | 1986.8  | 9.0       |
| 30°-40°   | 2165.7  | 9.8       |
| 40°-50°   | 1990.5  | 9.0       |
| 50°-60°   | 1563.2  | 7.1       |
| 60°-70°   | 1017.5  | 4.6       |
| 70°-80°   | 523.8   | 2.4       |
| 80°-90°   | 144.7   | 0.7       |
| 90°-100°  | 238.7   | 1.1       |
| 100°-110° | 758.6   | 3.4       |
| 110°-120° | 1298.1  | 5.9       |
| 120°-130° | 1707.2  | 7.7       |
| 130°-140° | 1916.3  | 8.7       |
| 140°-150° | 1879.1  | 8.5       |
| 150°-160° | 1576.3  | 7.1       |
| 160°-170° | 1045.4  | 4.7       |
| 170°-180° | 365.4   | 1.7       |
| 0°-30°    | 3917.3  | 17.7      |
| 0°-40°    | 6083.0  | 27.5      |
| 0°-60°    | 9636.8  | 43.6      |
| 0°-90°    | 11322.7 | 51.2      |
| 90°-120°  | 2295.4  | 10.4      |
| 90°-150°  | 7798.0  | 35.3      |
| 90°-180°  | 10785.0 | 48.8      |
| 0°-180°   | 22107.9 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 5500 | 5500  | 5500 | 5500  | 5500 |      |
| 5°   | 5500 | 5475  | 5410 | 5455  | 5440 | 522  |
| 15°  | 5231 | 5176  | 5008 | 4913  | 4863 | 1474 |
| 25°  | 4749 | 4589  | 4261 | 4057  | 3982 | 2184 |
| 35°  | 4092 | 3838  | 3400 | 3086  | 2976 | 2561 |
| 45°  | 3345 | 3011  | 2489 | 2135  | 2016 | 2583 |
| 55°  | 2543 | 2155  | 1618 | 1319  | 1225 | 2273 |
| 65°  | 1717 | 1314  | 866  | 697   | 682  | 1703 |
| 75°  | 916  | 567   | 398  | 363   | 358  | 969  |
| 85°  | 214  | 109   | 94   | 94    | 94   | 246  |
| 90°  | 3    | 42    | 114  | 107   | 110  | 22   |
| 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: P912358

CATALOG NUMBER: DFN2DIP-SQ4F0-120D110US850-RLFL

**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 5500.2 | 5500.2 | 5500.2 | 5500.2 | 5500.2 |
| 2.5°   | 5525.0 | 5500.2 | 5445.3 | 5495.4 | 5485.3 |
| 5°     | 5500.2 | 5475.4 | 5410.4 | 5455.3 | 5440.5 |
| 7.5°   | 5455.3 | 5425.7 | 5356.0 | 5375.5 | 5350.7 |
| 10°    | 5395.6 | 5360.8 | 5261.4 | 5246.1 | 5216.6 |
| 12.5°  | 5321.1 | 5276.3 | 5141.5 | 5112.0 | 5057.2 |
| 15°    | 5231.4 | 5176.5 | 5007.5 | 4912.9 | 4863.3 |
| 17.5°  | 5126.8 | 5047.1 | 4837.9 | 4728.7 | 4648.9 |
| 20°    | 5007.5 | 4907.7 | 4658.9 | 4534.8 | 4424.9 |
| 22.5°  | 4878.0 | 4763.5 | 4474.6 | 4305.6 | 4231.2 |
| 25°    | 4748.7 | 4589.2 | 4260.7 | 4056.8 | 3981.9 |
| 27.5°  | 4594.5 | 4424.9 | 4061.6 | 3827.7 | 3713.0 |
| 30°    | 4430.2 | 4240.7 | 3842.5 | 3588.9 | 3454.3 |
| 32.5°  | 4270.8 | 4041.5 | 3633.9 | 3335.0 | 3210.3 |
| 35°    | 4091.8 | 3837.7 | 3399.9 | 3086.2 | 2976.3 |
| 37.5°  | 3917.4 | 3643.4 | 3180.7 | 2836.9 | 2712.8 |
| 40°    | 3733.1 | 3434.8 | 2951.6 | 2598.3 | 2468.9 |
| 42.5°  | 3544.0 | 3225.6 | 2722.9 | 2354.3 | 2230.2 |
| 45°    | 3345.0 | 3011.3 | 2488.9 | 2135.2 | 2015.7 |
| 47.5°  | 3155.9 | 2802.7 | 2265.0 | 1911.3 | 1801.9 |
| 50°    | 2946.8 | 2593.5 | 2045.9 | 1702.1 | 1598.1 |
| 52.5°  | 2742.4 | 2369.0 | 1836.7 | 1508.2 | 1413.8 |
| 55°    | 2543.4 | 2155.2 | 1617.6 | 1319.2 | 1224.7 |
| 57.5°  | 2339.4 | 1941.3 | 1423.7 | 1144.9 | 1065.2 |
| 60°    | 2130.4 | 1732.1 | 1219.3 | 965.9  | 886.2  |
| 62.5°  | 1926.6 | 1528.3 | 1045.1 | 806.5  | 766.8  |
| 65°    | 1717.4 | 1313.9 | 866.1  | 697.1  | 681.8  |
| 67.5°  | 1518.3 | 1114.8 | 697.1  | 612.1  | 597.3  |
| 70°    | 1309.2 | 921.0  | 577.2  | 527.6  | 507.5  |
| 72.5°  | 1110.1 | 741.5  | 482.6  | 443.0  | 433.1  |
| 75°    | 915.7  | 567.1  | 398.2  | 363.3  | 358.5  |
| 77.5°  | 722.0  | 402.9  | 313.7  | 293.7  | 283.6  |
| 80°    | 542.4  | 288.9  | 238.7  | 219.1  | 219.1  |
| 82.5°  | 378.2  | 194.3  | 164.2  | 154.2  | 154.2  |
| 85°    | 213.9  | 109.3  | 94.5   | 94.5   | 94.5   |
| 87.5°  | 79.7   | 39.6   | 39.6   | 34.8   | 34.8   |
| 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 |

TEST NUMBER: P912358

CATALOG NUMBER: DFN2DIP-SQ4F0-120D110US850-RLLFLL

**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 |

TEST NUMBER: P912358

CATALOG NUMBER: DFN2DIP-SQ4F0-120D110US850-RLLFLL

**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 | 11.96            | 12.80 | 12.92 | 13.77 | 15.02 | 7.92           | 8.76  | 8.88  | 9.73  | 10.99 |
|                 | 3H   | 13.65            | 14.40 | 14.61 | 15.37 | 16.65 | 9.11           | 9.87  | 10.08 | 10.84 | 12.12 |
|                 | 4H   | 14.26            | 14.97 | 15.24 | 15.95 | 17.23 | 9.57           | 10.28 | 10.54 | 11.25 | 12.54 |
|                 | 6H   | 14.68            | 15.34 | 15.67 | 16.32 | 17.62 | 9.89           | 10.54 | 10.88 | 11.52 | 12.82 |
|                 | 8H   | 14.81            | 15.43 | 15.81 | 16.43 | 17.73 | 9.98           | 10.60 | 10.97 | 11.60 | 12.90 |
|                 | 12H  | 14.88            | 15.47 | 15.88 | 16.46 | 17.78 | 10.02          | 10.61 | 11.02 | 11.61 | 12.93 |
| 4H              | 2H   | 11.98            | 12.69 | 12.97 | 13.67 | 14.96 | 8.52           | 9.23  | 9.51  | 10.21 | 11.50 |
|                 | 3H   | 13.82            | 14.41 | 14.81 | 15.42 | 16.72 | 9.88           | 10.47 | 10.87 | 11.47 | 12.77 |
|                 | 4H   | 14.51            | 15.05 | 15.52 | 16.05 | 17.38 | 10.42          | 10.96 | 11.43 | 11.96 | 13.29 |
|                 | 6H   | 15.03            | 15.50 | 16.05 | 16.52 | 17.84 | 10.84          | 11.31 | 11.86 | 12.33 | 13.65 |
|                 | 8H   | 15.21            | 15.64 | 16.23 | 16.66 | 18.00 | 10.97          | 11.41 | 11.99 | 12.42 | 13.76 |
|                 | 12H  | 15.31            | 15.70 | 16.34 | 16.73 | 18.07 | 11.04          | 11.43 | 12.07 | 12.46 | 13.80 |
| 8H              | 4H   | 14.48            | 14.91 | 15.50 | 15.93 | 17.27 | 10.71          | 11.14 | 11.72 | 12.16 | 13.49 |
|                 | 6H   | 15.05            | 15.41 | 16.09 | 16.47 | 17.80 | 11.23          | 11.58 | 12.27 | 12.64 | 13.98 |
|                 | 8H   | 15.27            | 15.59 | 16.32 | 16.63 | 17.99 | 11.42          | 11.73 | 12.47 | 12.78 | 14.13 |
|                 | 12H  | 15.42            | 15.69 | 16.46 | 16.73 | 18.13 | 11.54          | 11.82 | 12.59 | 12.86 | 14.25 |
| 12H             | 4H   | 14.43            | 14.82 | 15.47 | 15.86 | 17.20 | 10.71          | 11.10 | 11.75 | 12.14 | 13.48 |
|                 | 6H   | 15.03            | 15.34 | 16.08 | 16.39 | 17.74 | 11.28          | 11.59 | 12.32 | 12.64 | 13.99 |
|                 | 8H   | 15.25            | 15.53 | 16.30 | 16.57 | 17.97 | 11.49          | 11.77 | 12.54 | 12.81 | 14.20 |