

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: P926684

Luminaire Tested: DFN2DIP-TR4F0-120D110US950-RLLFLL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P926684  
REPORT IS A COMBINATION OF REPORTS P900512 AND P897293  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-TR4F0-120D110US950-RLLFLL  
Description: 4 foot, Triangle Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

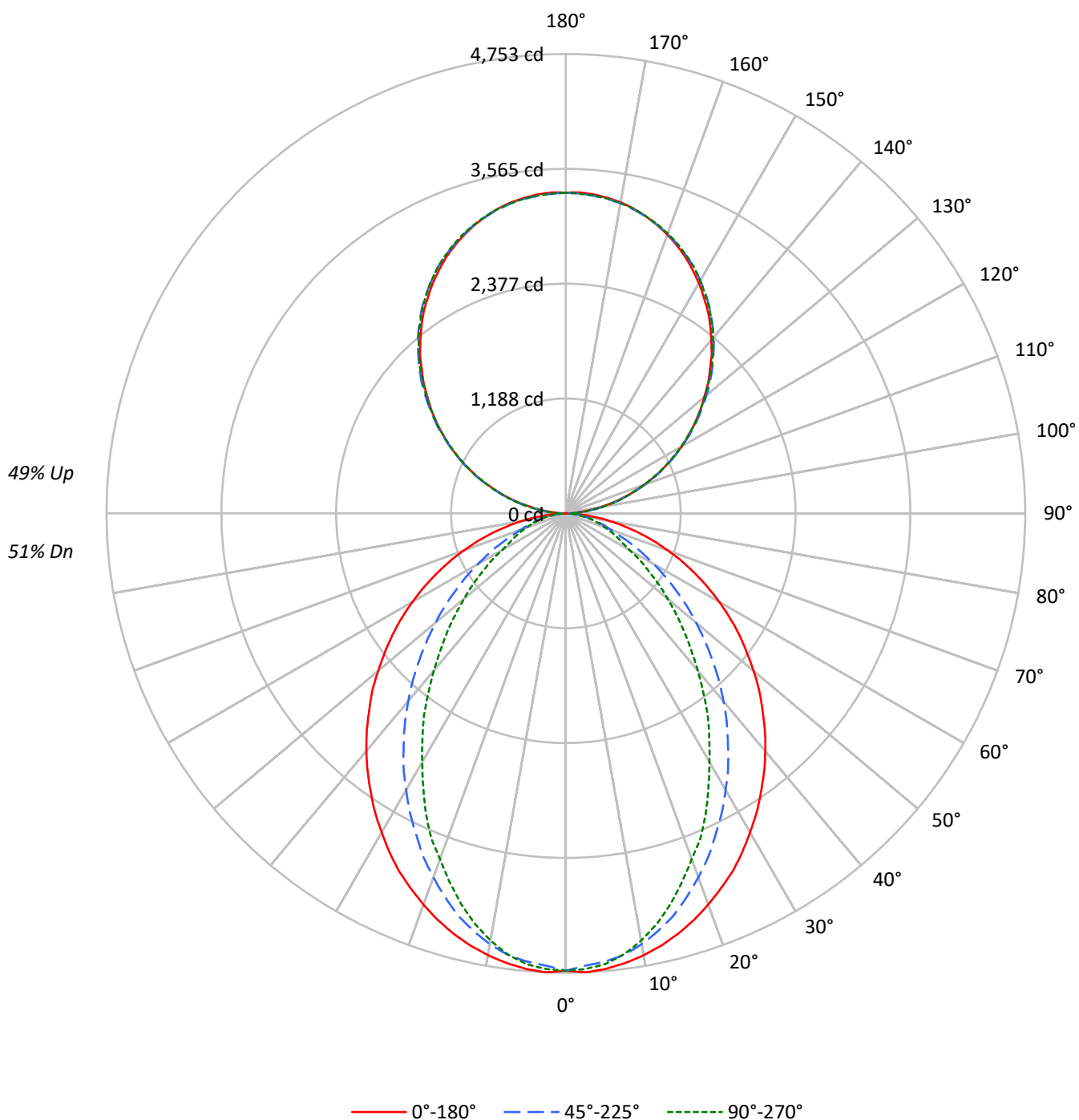
Lumens per Lamp: N/A  
Luminaire Lumens: 19018.0 lumens  
Efficiency: N/A  
Efficacy: 90.4 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 0.99 / 1.16  
Luminous Opening: Rectangular w/ Sides (W: 3.43' x L: 3.96' x H: 0.1')  
CIE Type: General Diffuse

Input Watts (W): 210.4  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9821  
Total Harmonic Distortion (THDi): 0.08  
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: P926684

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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 |
| RCR |     |     |     |     |    |    |    |    |    |    |    |  |    |    |    |  |    |
| 0   | 107 | 107 | 107 | 107 | 99 | 99 | 99 | 99 | 84 | 84 | 84 |  | 70 | 70 | 70 |  | 57 |
| 1   | 99  | 94  | 91  | 87  | 91 | 87 | 84 | 81 | 74 | 72 | 70 |  | 62 | 61 | 59 |  | 51 |
| 2   | 90  | 83  | 77  | 72  | 83 | 77 | 72 | 68 | 66 | 62 | 59 |  | 55 | 53 | 50 |  | 46 |
| 3   | 83  | 73  | 66  | 61  | 76 | 68 | 62 | 57 | 58 | 54 | 50 |  | 49 | 46 | 43 |  | 41 |
| 4   | 76  | 65  | 58  | 52  | 70 | 61 | 54 | 49 | 52 | 47 | 43 |  | 44 | 41 | 37 |  | 37 |
| 5   | 70  | 58  | 51  | 45  | 64 | 54 | 47 | 42 | 47 | 42 | 37 |  | 40 | 36 | 33 |  | 34 |
| 6   | 64  | 53  | 45  | 39  | 59 | 49 | 42 | 37 | 43 | 37 | 33 |  | 36 | 32 | 29 |  | 31 |
| 7   | 60  | 48  | 40  | 34  | 55 | 45 | 38 | 33 | 39 | 33 | 29 |  | 33 | 29 | 26 |  | 28 |
| 8   | 55  | 43  | 36  | 31  | 51 | 41 | 34 | 29 | 35 | 30 | 26 |  | 31 | 26 | 23 |  | 26 |
| 9   | 52  | 40  | 32  | 27  | 48 | 37 | 31 | 26 | 33 | 27 | 24 |  | 28 | 24 | 21 |  | 24 |
| 10  | 48  | 37  | 29  | 25  | 45 | 34 | 28 | 24 | 30 | 25 | 21 |  | 26 | 22 | 19 |  | 22 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 3759 | 3759 | 3759 |
| 5°  | 3765 | 3699 | 3723 |
| 10° | 3728 | 3627 | 3601 |
| 15° | 3676 | 3507 | 3414 |
| 20° | 3609 | 3341 | 3184 |
| 25° | 3539 | 3156 | 2962 |
| 30° | 3446 | 2966 | 2681 |
| 35° | 3354 | 2762 | 2433 |
| 40° | 3261 | 2551 | 2150 |
| 45° | 3153 | 2316 | 1893 |
| 50° | 3041 | 2080 | 1642 |
| 55° | 2925 | 1827 | 1401 |
| 60° | 2790 | 1562 | 1153 |
| 65° | 2634 | 1294 | 1038 |
| 70° | 2446 | 1043 | 939  |
| 75° | 2209 | 919  | 854  |
| 80° | 1867 | 771  | 740  |
| 85° | 1301 | 515  | 556  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 3153 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 443.4   | 2.3       |
| 10°-20°   | 1217.3  | 6.4       |
| 20°-30°   | 1709.1  | 9.0       |
| 30°-40°   | 1863.0  | 9.8       |
| 40°-50°   | 1712.3  | 9.0       |
| 50°-60°   | 1344.7  | 7.1       |
| 60°-70°   | 875.3   | 4.6       |
| 70°-80°   | 450.6   | 2.4       |
| 80°-90°   | 124.5   | 0.7       |
| 90°-100°  | 205.4   | 1.1       |
| 100°-110° | 652.5   | 3.4       |
| 110°-120° | 1116.7  | 5.9       |
| 120°-130° | 1468.6  | 7.7       |
| 130°-140° | 1648.4  | 8.7       |
| 140°-150° | 1616.5  | 8.5       |
| 150°-160° | 1356.0  | 7.1       |
| 160°-170° | 899.3   | 4.7       |
| 170°-180° | 314.3   | 1.7       |
| 0°-30°    | 3369.8  | 17.7      |
| 0°-40°    | 5232.8  | 27.5      |
| 0°-60°    | 8289.9  | 43.6      |
| 0°-90°    | 9740.2  | 51.2      |
| 90°-120°  | 1974.6  | 10.4      |
| 90°-150°  | 6708.2  | 35.3      |
| 90°-180°  | 9278.0  | 48.8      |
| 0°-180°   | 19018.0 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 4732 | 4732  | 4732 | 4732  | 4732 |      |
| 5°   | 4732 | 4710  | 4654 | 4693  | 4680 | 449  |
| 15°  | 4500 | 4453  | 4308 | 4226  | 4184 | 1268 |
| 25°  | 4085 | 3948  | 3665 | 3490  | 3425 | 1879 |
| 35°  | 3520 | 3301  | 2925 | 2655  | 2560 | 2203 |
| 45°  | 2878 | 2590  | 2141 | 1837  | 1734 | 2222 |
| 55°  | 2188 | 1854  | 1392 | 1135  | 1054 | 1955 |
| 65°  | 1477 | 1130  | 745  | 600   | 586  | 1465 |
| 75°  | 788  | 488   | 343  | 312   | 308  | 833  |
| 85°  | 184  | 94    | 81   | 81    | 81   | 211  |
| 90°  | 3    | 36    | 98   | 92    | 95   | 19   |
| 95°  | 146  | 174   | 179  | 179   | 174  | 163  |
| 105° | 602  | 610   | 616  | 621   | 621  | 636  |
| 115° | 1121 | 1137  | 1132 | 1129  | 1121 | 1108 |
| 125° | 1630 | 1655  | 1647 | 1638  | 1635 | 1457 |
| 135° | 2108 | 2139  | 2145 | 2142  | 2134 | 1630 |
| 145° | 2559 | 2579  | 2596 | 2598  | 2587 | 1599 |
| 155° | 2927 | 2935  | 2944 | 2958  | 2949 | 1347 |
| 165° | 3184 | 3181  | 3181 | 3201  | 3187 | 898  |
| 175° | 3313 | 3305  | 3299 | 3319  | 3302 | 315  |
| 180° | 3319 | 3319  | 3319 | 3319  | 3319 |      |

TEST NUMBER: P926684

CATALOG NUMBER: DFN2DIP-TR4F0-120D110US950-RLLFLL

**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 4731.5 | 4731.5 | 4731.5 | 4731.5 | 4731.5 |
| 2.5°   | 4752.8 | 4731.5 | 4684.2 | 4727.4 | 4718.7 |
| 5°     | 4731.5 | 4710.1 | 4654.2 | 4692.8 | 4680.1 |
| 7.5°   | 4692.8 | 4667.3 | 4607.4 | 4624.2 | 4602.9 |
| 10°    | 4641.5 | 4611.5 | 4526.1 | 4512.9 | 4487.5 |
| 12.5°  | 4577.4 | 4538.8 | 4422.9 | 4397.6 | 4350.3 |
| 15°    | 4500.2 | 4453.0 | 4307.6 | 4226.2 | 4183.6 |
| 17.5°  | 4410.2 | 4341.7 | 4161.7 | 4067.8 | 3999.2 |
| 20°    | 4307.6 | 4221.7 | 4007.8 | 3901.0 | 3806.5 |
| 22.5°  | 4196.3 | 4097.7 | 3849.2 | 3703.8 | 3639.8 |
| 25°    | 4085.0 | 3947.7 | 3665.2 | 3489.8 | 3425.3 |
| 27.5°  | 3952.3 | 3806.5 | 3493.9 | 3292.7 | 3194.1 |
| 30°    | 3811.0 | 3648.0 | 3305.4 | 3087.3 | 2971.5 |
| 32.5°  | 3673.9 | 3476.7 | 3126.0 | 2868.9 | 2761.6 |
| 35°    | 3519.9 | 3301.3 | 2924.7 | 2654.9 | 2560.3 |
| 37.5°  | 3369.9 | 3134.2 | 2736.2 | 2440.4 | 2333.7 |
| 40°    | 3211.4 | 2954.7 | 2539.1 | 2235.1 | 2123.8 |
| 42.5°  | 3048.7 | 2774.8 | 2342.4 | 2025.2 | 1918.5 |
| 45°    | 2877.5 | 2590.4 | 2141.1 | 1836.7 | 1734.0 |
| 47.5°  | 2714.8 | 2410.9 | 1948.4 | 1644.1 | 1550.1 |
| 50°    | 2535.0 | 2231.0 | 1759.9 | 1464.2 | 1374.7 |
| 52.5°  | 2359.1 | 2037.9 | 1580.0 | 1297.4 | 1216.2 |
| 55°    | 2187.9 | 1854.0 | 1391.5 | 1134.8 | 1053.5 |
| 57.5°  | 2012.5 | 1670.0 | 1224.7 | 984.9  | 916.3  |
| 60°    | 1832.6 | 1490.1 | 1048.9 | 830.9  | 762.3  |
| 62.5°  | 1657.3 | 1314.7 | 899.0  | 693.7  | 659.6  |
| 65°    | 1477.4 | 1130.3 | 745.1  | 599.7  | 586.5  |
| 67.5°  | 1306.1 | 959.0  | 599.7  | 526.5  | 513.8  |
| 70°    | 1126.2 | 792.3  | 496.6  | 453.8  | 436.6  |
| 72.5°  | 955.0  | 637.8  | 415.2  | 381.1  | 372.5  |
| 75°    | 787.7  | 487.9  | 342.6  | 312.5  | 308.4  |
| 77.5°  | 621.1  | 346.6  | 269.9  | 252.6  | 243.9  |
| 80°    | 466.6  | 248.5  | 205.3  | 188.5  | 188.5  |
| 82.5°  | 325.3  | 167.1  | 141.3  | 132.6  | 132.6  |
| 85°    | 184.0  | 94.1   | 81.3   | 81.3   | 81.3   |
| 87.5°  | 68.6   | 34.1   | 34.1   | 30.0   | 30.0   |
| 90°    | 3.0    | 36.1   | 98.1   | 92.1   | 95.0   |
| 92.5°  | 62.0   | 84.0   | 87.0   | 90.1   | 90.1   |
| 95°    | 146.1  | 174.1  | 179.1  | 179.1  | 174.1  |
| 97.5°  | 243.2  | 269.1  | 280.2  | 280.2  | 280.2  |
| 100°   | 355.2  | 378.2  | 386.2  | 386.2  | 383.2  |
| 102.5° | 473.3  | 490.3  | 501.3  | 504.3  | 501.3  |
| 105°   | 602.4  | 610.4  | 616.4  | 621.3  | 621.3  |
| 107.5° | 730.4  | 742.4  | 742.4  | 744.4  | 730.4  |
| 110°   | 854.5  | 870.5  | 870.5  | 870.5  | 862.5  |



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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 988.5  | 1005.5 | 1002.6 | 994.5  | 988.5  |
| 115°   | 1120.7 | 1136.6 | 1131.6 | 1128.7 | 1120.7 |
| 117.5° | 1251.7 | 1273.7 | 1259.7 | 1251.7 | 1243.7 |
| 120°   | 1383.8 | 1405.8 | 1383.8 | 1383.8 | 1374.8 |
| 122.5° | 1503.9 | 1531.8 | 1517.8 | 1509.8 | 1503.9 |
| 125°   | 1629.9 | 1654.9 | 1646.9 | 1637.9 | 1634.9 |
| 127.5° | 1753.0 | 1784.0 | 1773.0 | 1761.0 | 1753.0 |
| 130°   | 1868.0 | 1904.1 | 1899.0 | 1893.0 | 1882.1 |
| 132.5° | 1997.1 | 2025.2 | 2027.2 | 2013.1 | 2005.1 |
| 135°   | 2108.1 | 2139.2 | 2145.2 | 2142.2 | 2134.2 |
| 137.5° | 2232.3 | 2257.3 | 2262.2 | 2260.2 | 2248.3 |
| 140°   | 2341.3 | 2366.3 | 2380.3 | 2380.3 | 2369.4 |
| 142.5° | 2453.4 | 2478.4 | 2486.4 | 2489.4 | 2478.4 |
| 145°   | 2559.4 | 2579.4 | 2595.5 | 2598.4 | 2587.4 |
| 147.5° | 2654.5 | 2679.5 | 2691.5 | 2696.5 | 2685.5 |
| 150°   | 2752.6 | 2769.6 | 2780.5 | 2789.6 | 2780.5 |
| 152.5° | 2839.6 | 2856.6 | 2870.6 | 2881.7 | 2870.6 |
| 155°   | 2926.7 | 2934.6 | 2943.7 | 2957.7 | 2948.6 |
| 157.5° | 3001.7 | 3007.7 | 3012.6 | 3032.7 | 3018.6 |
| 160°   | 3068.7 | 3074.7 | 3077.7 | 3094.8 | 3082.8 |
| 162.5° | 3130.7 | 3130.7 | 3133.8 | 3152.8 | 3138.8 |
| 165°   | 3183.8 | 3180.7 | 3180.7 | 3200.8 | 3186.7 |
| 167.5° | 3231.8 | 3222.8 | 3222.8 | 3242.8 | 3228.8 |
| 170°   | 3267.8 | 3259.8 | 3256.9 | 3276.8 | 3259.8 |
| 172.5° | 3292.8 | 3284.8 | 3281.9 | 3301.9 | 3284.8 |
| 175°   | 3312.9 | 3304.8 | 3298.8 | 3318.9 | 3301.9 |
| 177.5° | 3323.8 | 3315.8 | 3309.8 | 3326.9 | 3309.8 |
| 180°   | 3318.9 | 3318.9 | 3318.9 | 3318.9 | 3318.9 |

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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 | 11.85            | 12.69 | 12.81 | 13.66 | 14.92 | 7.83           | 8.67  | 8.78  | 9.63  | 10.89 |
|                 | 3H   | 13.53            | 14.28 | 14.50 | 15.26 | 16.54 | 9.02           | 9.77  | 9.98  | 10.74 | 12.02 |
|                 | 4H   | 14.14            | 14.85 | 15.12 | 15.83 | 17.12 | 9.47           | 10.18 | 10.45 | 11.16 | 12.45 |
|                 | 6H   | 14.56            | 15.22 | 15.55 | 16.20 | 17.50 | 9.79           | 10.45 | 10.78 | 11.43 | 12.73 |
|                 | 8H   | 14.69            | 15.31 | 15.69 | 16.31 | 17.61 | 9.88           | 10.50 | 10.88 | 11.50 | 12.80 |
|                 | 12H  | 14.75            | 15.34 | 15.75 | 16.34 | 17.66 | 9.93           | 10.52 | 10.93 | 11.51 | 12.83 |
| 4H              | 2H   | 11.87            | 12.58 | 12.86 | 13.56 | 14.85 | 8.42           | 9.13  | 9.41  | 10.11 | 11.40 |
|                 | 3H   | 13.70            | 14.29 | 14.70 | 15.30 | 16.60 | 9.78           | 10.37 | 10.77 | 11.37 | 12.68 |
|                 | 4H   | 14.40            | 14.94 | 15.40 | 15.94 | 17.26 | 10.33          | 10.86 | 11.33 | 11.86 | 13.19 |
|                 | 6H   | 14.91            | 15.37 | 15.92 | 16.40 | 17.72 | 10.75          | 11.21 | 11.76 | 12.23 | 13.56 |
|                 | 8H   | 15.09            | 15.52 | 16.10 | 16.54 | 17.87 | 10.88          | 11.31 | 11.89 | 12.32 | 13.66 |
|                 | 12H  | 15.18            | 15.57 | 16.21 | 16.60 | 17.95 | 10.94          | 11.33 | 11.97 | 12.36 | 13.71 |
| 8H              | 4H   | 14.36            | 14.80 | 15.38 | 15.81 | 17.15 | 10.61          | 11.04 | 11.62 | 12.06 | 13.39 |
|                 | 6H   | 14.93            | 15.29 | 15.97 | 16.35 | 17.68 | 11.13          | 11.48 | 12.16 | 12.54 | 13.88 |
|                 | 8H   | 15.15            | 15.46 | 16.19 | 16.51 | 17.86 | 11.32          | 11.63 | 12.36 | 12.68 | 14.03 |
|                 | 12H  | 15.29            | 15.56 | 16.34 | 16.60 | 18.00 | 11.44          | 11.71 | 12.49 | 12.75 | 14.15 |
| 12H             | 4H   | 14.32            | 14.71 | 15.35 | 15.74 | 17.08 | 10.61          | 11.00 | 11.64 | 12.03 | 13.38 |
|                 | 6H   | 14.91            | 15.22 | 15.95 | 16.27 | 17.62 | 11.17          | 11.49 | 12.22 | 12.53 | 13.89 |
|                 | 8H   | 15.13            | 15.40 | 16.18 | 16.44 | 17.84 | 11.39          | 11.66 | 12.44 | 12.70 | 14.10 |