

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: P914987

Luminaire Tested: DFN2DIP-SQ4F0-090D140US927-RLLONL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P914987  
REPORT IS A COMBINATION OF REPORTS P901712 AND P898471  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-SQ4F0-090D140US927-RLONL  
Description: 4 foot, Square Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

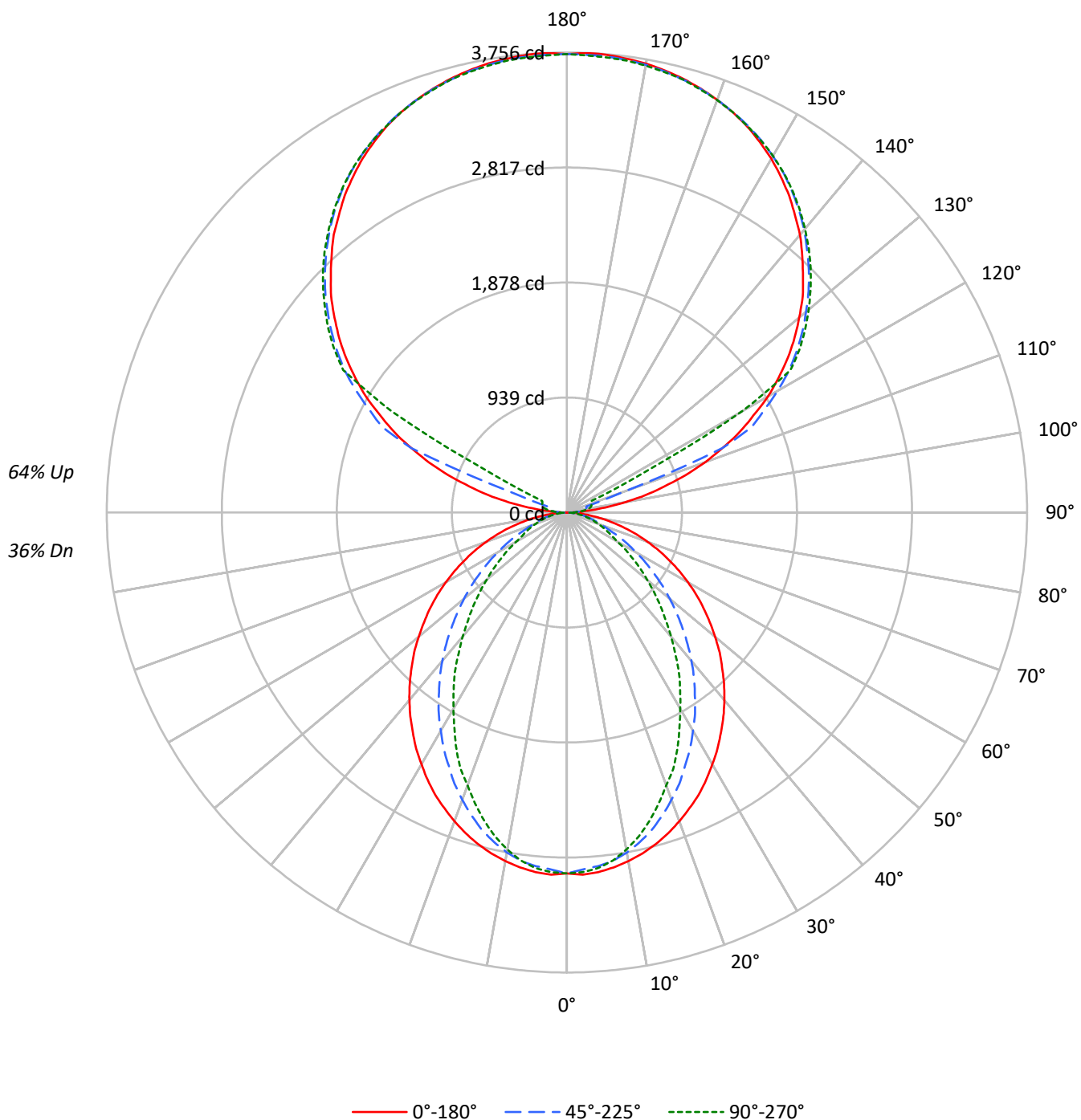
Lumens per Lamp: N/A  
Luminaire Lumens: 17039.8 lumens  
Efficiency: N/A  
Efficacy: 90.4 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 0.99 / 1.16  
Luminous Opening: Rectangular w/ Sides (W: 3.92' x L: 3.92' x H: 0.1')  
CIE Type: Semi-Indirect

Input Watts (W): 188.5  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.983  
Total Harmonic Distortion (THDi): 0.073  
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



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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   | 104 | 104 | 104 | 104 | 94 | 94 | 94 | 94 | 75 | 75 | 75 | 58 | 58 | 58 | 43 | 43 | 43 |
| 1   | 95  | 91  | 87  | 84  | 86 | 82 | 79 | 76 | 66 | 64 | 62 | 52 | 50 | 49 | 38 | 38 | 37 |
| 2   | 87  | 80  | 74  | 69  | 78 | 72 | 67 | 63 | 59 | 55 | 52 | 46 | 44 | 42 | 34 | 33 | 32 |
| 3   | 79  | 70  | 63  | 58  | 71 | 64 | 58 | 53 | 52 | 48 | 44 | 41 | 38 | 36 | 31 | 29 | 27 |
| 4   | 73  | 62  | 55  | 49  | 66 | 57 | 50 | 45 | 46 | 42 | 38 | 37 | 33 | 31 | 28 | 25 | 24 |
| 5   | 67  | 56  | 48  | 42  | 60 | 51 | 44 | 39 | 42 | 37 | 33 | 33 | 30 | 27 | 25 | 23 | 21 |
| 6   | 61  | 50  | 42  | 37  | 56 | 46 | 39 | 34 | 37 | 32 | 29 | 30 | 26 | 24 | 23 | 20 | 19 |
| 7   | 57  | 45  | 37  | 32  | 51 | 41 | 35 | 30 | 34 | 29 | 25 | 27 | 24 | 21 | 21 | 18 | 17 |
| 8   | 53  | 41  | 34  | 28  | 48 | 38 | 31 | 26 | 31 | 26 | 23 | 25 | 21 | 19 | 19 | 17 | 15 |
| 9   | 49  | 37  | 30  | 25  | 44 | 34 | 28 | 24 | 28 | 24 | 20 | 23 | 19 | 17 | 18 | 15 | 14 |
| 10  | 46  | 34  | 27  | 23  | 42 | 31 | 25 | 21 | 26 | 21 | 18 | 21 | 18 | 15 | 17 | 14 | 12 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 2068 | 2068 | 2068 |
| 5°  | 2071 | 2035 | 2048 |
| 10° | 2050 | 1996 | 1982 |
| 15° | 2022 | 1930 | 1880 |
| 20° | 1985 | 1840 | 1754 |
| 25° | 1947 | 1738 | 1632 |
| 30° | 1895 | 1634 | 1478 |
| 35° | 1845 | 1522 | 1342 |
| 40° | 1794 | 1406 | 1186 |
| 45° | 1734 | 1277 | 1045 |
| 50° | 1672 | 1147 | 907  |
| 55° | 1608 | 1008 | 774  |
| 60° | 1534 | 863  | 638  |
| 65° | 1448 | 715  | 575  |
| 70° | 1345 | 577  | 521  |
| 75° | 1214 | 510  | 475  |
| 80° | 1026 | 429  | 414  |
| 85° | 714  | 288  | 315  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 90°

Vertical Angle: 90°

Luminance: 2006 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 276.2   | 1.6       |
| 10°-20°   | 758.1   | 4.4       |
| 20°-30°   | 1064.4  | 6.2       |
| 30°-40°   | 1160.3  | 6.8       |
| 40°-50°   | 1066.4  | 6.3       |
| 50°-60°   | 837.5   | 4.9       |
| 60°-70°   | 545.1   | 3.2       |
| 70°-80°   | 280.6   | 1.6       |
| 80°-90°   | 78.2    | 0.5       |
| 90°-100°  | 123.4   | 0.7       |
| 100°-110° | 460.1   | 2.7       |
| 110°-120° | 1220.2  | 7.2       |
| 120°-130° | 2023.8  | 11.9      |
| 130°-140° | 2149.8  | 12.6      |
| 140°-150° | 1998.0  | 11.7      |
| 150°-160° | 1606.3  | 9.4       |
| 160°-170° | 1035.1  | 6.1       |
| 170°-180° | 356.3   | 2.1       |
| 0°-30°    | 2098.7  | 12.3      |
| 0°-40°    | 3258.9  | 19.1      |
| 0°-60°    | 5162.8  | 30.3      |
| 0°-90°    | 6066.8  | 35.6      |
| 90°-120°  | 1803.7  | 10.6      |
| 90°-150°  | 7975.4  | 46.8      |
| 90°-180°  | 10973.0 | 64.4      |
| 0°-180°   | 17039.8 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 2947 | 2947  | 2947 | 2947  | 2947 |      |
| 5°   | 2947 | 2933  | 2899 | 2923  | 2915 | 279  |
| 15°  | 2803 | 2773  | 2683 | 2632  | 2606 | 790  |
| 25°  | 2544 | 2459  | 2283 | 2173  | 2133 | 1170 |
| 35°  | 2192 | 2056  | 1822 | 1653  | 1595 | 1372 |
| 45°  | 1792 | 1613  | 1333 | 1144  | 1080 | 1384 |
| 55°  | 1363 | 1155  | 867  | 707   | 656  | 1218 |
| 65°  | 920  | 704   | 464  | 373   | 365  | 912  |
| 75°  | 491  | 304   | 213  | 195   | 192  | 519  |
| 85°  | 114  | 58    | 51   | 51    | 51   | 132  |
| 90°  | 2    | 32    | 54   | 68    | 73   | 16   |
| 95°  | 176  | 86    | 106  | 119   | 116  | 208  |
| 105° | 823  | 905   | 165  | 195   | 206  | 880  |
| 115° | 1557 | 1603  | 1671 | 417   | 222  | 1533 |
| 125° | 2202 | 2237  | 2289 | 2308  | 2316 | 1964 |
| 135° | 2725 | 2768  | 2792 | 2820  | 2814 | 2105 |
| 145° | 3161 | 3158  | 3204 | 3223  | 3209 | 1977 |
| 155° | 3480 | 3456  | 3488 | 3505  | 3483 | 1604 |
| 165° | 3667 | 3651  | 3659 | 3678  | 3659 | 1036 |
| 175° | 3751 | 3732  | 3737 | 3756  | 3729 | 357  |
| 180° | 3743 | 3743  | 3743 | 3743  | 3743 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 2946.7 | 2946.7 | 2946.7 | 2946.7 | 2946.7 |
| 2.5°   | 2960.0 | 2946.7 | 2917.2 | 2944.1 | 2938.8 |
| 5°     | 2946.7 | 2933.4 | 2898.6 | 2922.6 | 2914.7 |
| 7.5°   | 2922.6 | 2906.8 | 2869.4 | 2879.9 | 2866.6 |
| 10°    | 2890.7 | 2872.0 | 2818.8 | 2810.6 | 2794.7 |
| 12.5°  | 2850.7 | 2826.7 | 2754.6 | 2738.7 | 2709.3 |
| 15°    | 2802.7 | 2773.3 | 2682.7 | 2632.0 | 2605.5 |
| 17.5°  | 2746.7 | 2704.0 | 2591.9 | 2533.3 | 2490.6 |
| 20°    | 2682.7 | 2629.2 | 2495.9 | 2429.5 | 2370.6 |
| 22.5°  | 2613.4 | 2552.0 | 2397.2 | 2306.7 | 2266.8 |
| 25°    | 2544.1 | 2458.6 | 2282.7 | 2173.4 | 2133.3 |
| 27.5°  | 2461.5 | 2370.6 | 2176.0 | 2050.6 | 1989.2 |
| 30°    | 2373.5 | 2271.9 | 2058.6 | 1922.8 | 1850.6 |
| 32.5°  | 2288.0 | 2165.2 | 1946.8 | 1786.7 | 1719.9 |
| 35°    | 2192.1 | 2056.0 | 1821.5 | 1653.4 | 1594.6 |
| 37.5°  | 2098.7 | 1951.9 | 1704.1 | 1519.9 | 1453.4 |
| 40°    | 2000.0 | 1840.2 | 1581.3 | 1392.0 | 1322.7 |
| 42.5°  | 1898.7 | 1728.1 | 1458.7 | 1261.3 | 1194.8 |
| 45°    | 1792.1 | 1613.3 | 1333.4 | 1143.8 | 1079.9 |
| 47.5°  | 1690.8 | 1501.5 | 1213.5 | 1023.9 | 965.4  |
| 50°    | 1578.7 | 1389.4 | 1096.1 | 911.9  | 856.1  |
| 52.5°  | 1469.3 | 1269.2 | 984.0  | 808.0  | 757.4  |
| 55°    | 1362.6 | 1154.6 | 866.6  | 706.8  | 656.1  |
| 57.5°  | 1253.4 | 1040.1 | 762.8  | 613.4  | 570.7  |
| 60°    | 1141.3 | 928.0  | 653.3  | 517.5  | 474.8  |
| 62.5°  | 1032.1 | 818.8  | 559.9  | 432.1  | 410.8  |
| 65°    | 920.0  | 703.9  | 464.0  | 373.4  | 365.3  |
| 67.5°  | 813.4  | 597.2  | 373.4  | 327.9  | 320.0  |
| 70°    | 701.4  | 493.4  | 309.3  | 282.7  | 271.9  |
| 72.5°  | 594.7  | 397.2  | 258.6  | 237.3  | 232.0  |
| 75°    | 490.6  | 303.9  | 213.3  | 194.6  | 192.1  |
| 77.5°  | 386.7  | 215.9  | 168.0  | 157.3  | 151.9  |
| 80°    | 290.6  | 154.8  | 127.9  | 117.4  | 117.4  |
| 82.5°  | 202.6  | 104.1  | 88.0   | 82.6   | 82.6   |
| 85°    | 114.5  | 58.5   | 50.6   | 50.6   | 50.6   |
| 87.5°  | 42.7   | 21.2   | 21.2   | 18.7   | 18.7   |
| 90°    | 2.5    | 32.5   | 54.0   | 67.9   | 73.0   |
| 92.5°  | 67.9   | 57.0   | 65.0   | 70.4   | 73.0   |
| 95°    | 175.9  | 86.5   | 105.5  | 119.3  | 116.5  |
| 97.5°  | 316.8  | 94.9   | 138.0  | 146.3  | 148.9  |
| 100°   | 479.5  | 108.4  | 154.4  | 175.9  | 181.4  |
| 102.5° | 658.0  | 652.8  | 159.9  | 189.4  | 197.8  |
| 105°   | 823.3  | 904.7  | 165.3  | 194.9  | 205.8  |
| 107.5° | 1015.7 | 1083.1 | 170.8  | 200.3  | 211.3  |
| 110°   | 1199.9 | 1256.6 | 474.0  | 203.3  | 213.9  |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 1373.2 | 1421.8 | 1375.9 | 208.4  | 216.7  |
| 115°   | 1557.3 | 1603.2 | 1671.1 | 417.2  | 222.2  |
| 117.5° | 1717.1 | 1771.1 | 1817.4 | 1429.9 | 720.4  |
| 120°   | 1895.9 | 1936.4 | 1985.3 | 2017.8 | 1652.1 |
| 122.5° | 2047.4 | 2090.8 | 2145.1 | 2161.2 | 2164.2 |
| 125°   | 2201.8 | 2237.1 | 2288.6 | 2307.5 | 2315.6 |
| 127.5° | 2342.6 | 2380.6 | 2421.4 | 2448.4 | 2451.0 |
| 130°   | 2475.4 | 2518.9 | 2548.4 | 2578.4 | 2575.8 |
| 132.5° | 2610.9 | 2646.2 | 2675.8 | 2700.2 | 2697.7 |
| 135°   | 2724.7 | 2768.1 | 2792.2 | 2819.5 | 2814.1 |
| 137.5° | 2843.7 | 2876.2 | 2903.5 | 2930.5 | 2922.5 |
| 140°   | 2960.1 | 2982.0 | 3011.6 | 3036.0 | 3022.5 |
| 142.5° | 3057.9 | 3076.8 | 3111.9 | 3133.5 | 3119.9 |
| 145°   | 3160.8 | 3157.9 | 3203.9 | 3222.9 | 3209.4 |
| 147.5° | 3249.9 | 3241.8 | 3287.9 | 3301.3 | 3290.7 |
| 150°   | 3336.7 | 3317.7 | 3361.1 | 3377.2 | 3363.8 |
| 152.5° | 3409.7 | 3388.2 | 3428.7 | 3445.1 | 3426.1 |
| 155°   | 3480.1 | 3456.0 | 3488.5 | 3504.6 | 3483.1 |
| 157.5° | 3537.1 | 3515.5 | 3540.0 | 3559.0 | 3537.1 |
| 160°   | 3586.0 | 3569.6 | 3586.0 | 3602.0 | 3583.1 |
| 162.5° | 3629.1 | 3613.0 | 3626.5 | 3645.5 | 3621.1 |
| 165°   | 3667.0 | 3650.9 | 3659.0 | 3677.9 | 3659.0 |
| 167.5° | 3697.0 | 3680.6 | 3688.9 | 3707.9 | 3683.4 |
| 170°   | 3721.4 | 3705.0 | 3710.4 | 3729.4 | 3705.0 |
| 172.5° | 3737.4 | 3721.4 | 3726.8 | 3745.8 | 3721.4 |
| 175°   | 3751.0 | 3732.0 | 3737.4 | 3756.4 | 3729.4 |
| 177.5° | 3756.4 | 3737.4 | 3740.4 | 3759.3 | 3734.9 |
| 180°   | 3742.9 | 3742.9 | 3742.9 | 3742.9 | 3742.9 |

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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 | 8.17             | 8.89  | 9.25  | 9.97  | 11.43 | 4.13           | 4.86 | 5.21 | 5.93 | 7.39  |
|                 | 3H   | 9.84             | 10.49 | 10.93 | 11.57 | 13.06 | 5.31           | 5.96 | 6.40 | 7.04 | 8.53  |
|                 | 4H   | 10.45            | 11.06 | 11.55 | 12.15 | 13.64 | 5.76           | 6.37 | 6.85 | 7.46 | 8.94  |
|                 | 6H   | 10.87            | 11.43 | 11.98 | 12.52 | 14.02 | 6.07           | 6.64 | 7.18 | 7.73 | 9.23  |
|                 | 8H   | 11.00            | 11.53 | 12.10 | 12.64 | 14.13 | 6.16           | 6.70 | 7.27 | 7.80 | 9.30  |
|                 | 12H  | 11.06            | 11.57 | 12.17 | 12.66 | 14.18 | 6.20           | 6.71 | 7.31 | 7.81 | 9.33  |
| 4H              | 2H   | 8.17             | 8.79  | 9.28  | 9.87  | 11.36 | 4.71           | 5.33 | 5.82 | 6.41 | 7.90  |
|                 | 3H   | 10.00            | 10.51 | 11.11 | 11.62 | 13.12 | 6.06           | 6.57 | 7.17 | 7.68 | 9.18  |
|                 | 4H   | 10.69            | 11.16 | 11.80 | 12.26 | 13.78 | 6.60           | 7.07 | 7.72 | 8.17 | 9.69  |
|                 | 6H   | 11.20            | 11.61 | 12.33 | 12.73 | 14.24 | 7.01           | 7.42 | 8.14 | 8.54 | 10.06 |
|                 | 8H   | 11.38            | 11.75 | 12.50 | 12.87 | 14.40 | 7.14           | 7.52 | 8.26 | 8.63 | 10.16 |
|                 | 12H  | 11.47            | 11.81 | 12.61 | 12.94 | 14.48 | 7.20           | 7.54 | 8.34 | 8.67 | 10.21 |
| 8H              | 4H   | 10.65            | 11.03 | 11.77 | 12.14 | 13.67 | 6.88           | 7.25 | 8.00 | 8.37 | 9.90  |
|                 | 6H   | 11.22            | 11.53 | 12.36 | 12.68 | 14.21 | 7.39           | 7.70 | 8.53 | 8.86 | 10.39 |
|                 | 8H   | 11.44            | 11.71 | 12.58 | 12.84 | 14.39 | 7.58           | 7.85 | 8.73 | 8.99 | 10.54 |
|                 | 12H  | 11.57            | 11.81 | 12.73 | 12.95 | 14.53 | 7.70           | 7.94 | 8.85 | 9.07 | 10.65 |
| 12H             | 4H   | 10.60            | 10.94 | 11.74 | 12.06 | 13.60 | 6.88           | 7.22 | 8.01 | 8.34 | 9.88  |
|                 | 6H   | 11.19            | 11.46 | 12.34 | 12.60 | 14.15 | 7.44           | 7.71 | 8.59 | 8.85 | 10.40 |
|                 | 8H   | 11.41            | 11.65 | 12.56 | 12.78 | 14.37 | 7.65           | 7.89 | 8.80 | 9.02 | 10.60 |