

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: P915021

Luminaire Tested: DFN2DIP-SQ4F0-100D140US927-FLLONL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P915021  
REPORT IS A COMBINATION OF REPORTS P901713 AND P898471  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-SQ4F0-100D140US927-FLLONL  
Description: 4 foot, Square Define Geo, with Direct Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

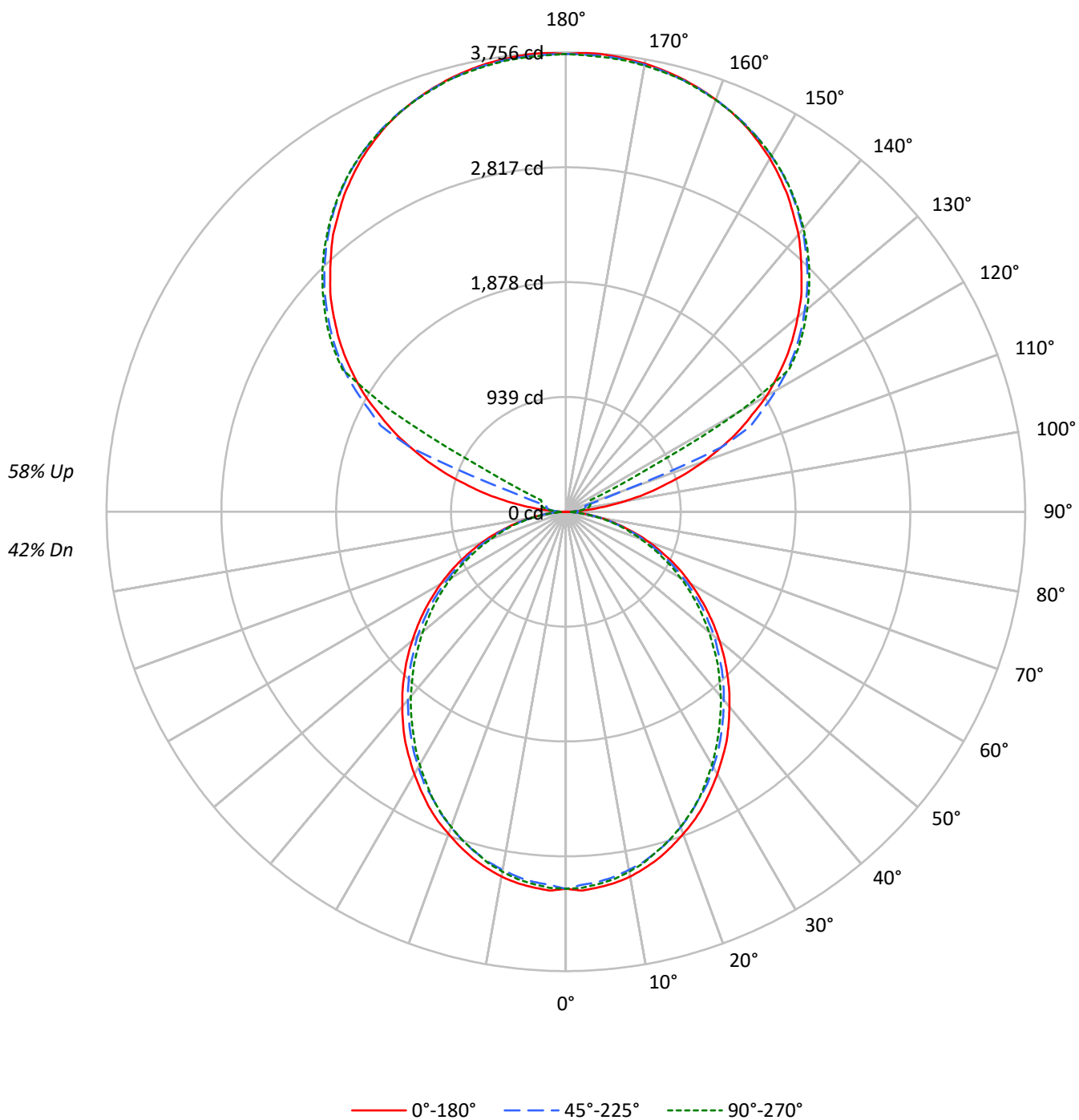
Lumens per Lamp: N/A  
Luminaire Lumens: 18822.2 lumens  
Efficiency: N/A  
Efficacy: 94.8 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 3.92' x L: 3.92' x H: 0.1')  
CIE Type: General Diffuse

Input Watts (W): 198.5  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9968  
Total Harmonic Distortion (THDi): 0.064  
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   | 105 | 105 | 105 | 105 | 96 | 96 | 96 | 96 | 79 | 79 | 79 | 63 | 63 | 63 | 49 | 49 | 49 |
| 1   | 96  | 92  | 88  | 84  | 87 | 84 | 80 | 78 | 69 | 67 | 65 | 55 | 54 | 52 | 43 | 42 | 41 |
| 2   | 87  | 80  | 74  | 69  | 79 | 73 | 68 | 64 | 60 | 57 | 53 | 49 | 46 | 44 | 38 | 36 | 34 |
| 3   | 80  | 70  | 63  | 57  | 72 | 64 | 58 | 53 | 53 | 49 | 45 | 43 | 40 | 37 | 33 | 31 | 29 |
| 4   | 73  | 62  | 54  | 48  | 66 | 57 | 50 | 45 | 47 | 42 | 38 | 38 | 35 | 32 | 30 | 27 | 25 |
| 5   | 67  | 55  | 47  | 41  | 61 | 51 | 44 | 39 | 42 | 37 | 33 | 34 | 30 | 27 | 27 | 24 | 22 |
| 6   | 62  | 50  | 42  | 36  | 56 | 46 | 39 | 33 | 38 | 33 | 29 | 31 | 27 | 24 | 24 | 22 | 19 |
| 7   | 57  | 45  | 37  | 31  | 52 | 41 | 34 | 29 | 34 | 29 | 25 | 28 | 24 | 21 | 22 | 19 | 17 |
| 8   | 53  | 41  | 33  | 28  | 48 | 37 | 31 | 26 | 31 | 26 | 22 | 26 | 22 | 19 | 20 | 18 | 15 |
| 9   | 49  | 37  | 30  | 25  | 45 | 34 | 28 | 23 | 29 | 24 | 20 | 24 | 20 | 17 | 19 | 16 | 14 |
| 10  | 46  | 34  | 27  | 22  | 42 | 31 | 25 | 21 | 26 | 21 | 18 | 22 | 18 | 15 | 18 | 15 | 13 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 2163 | 2163 | 2163 |
| 5°  | 2166 | 2133 | 2148 |
| 10° | 2149 | 2105 | 2119 |
| 15° | 2117 | 2071 | 2074 |
| 20° | 2074 | 2023 | 2028 |
| 25° | 2032 | 1966 | 1975 |
| 30° | 1979 | 1913 | 1908 |
| 35° | 1928 | 1850 | 1836 |
| 40° | 1866 | 1786 | 1768 |
| 45° | 1804 | 1723 | 1698 |
| 50° | 1736 | 1656 | 1617 |
| 55° | 1665 | 1579 | 1543 |
| 60° | 1585 | 1488 | 1458 |
| 65° | 1498 | 1393 | 1358 |
| 70° | 1387 | 1278 | 1250 |
| 75° | 1232 | 1140 | 1152 |
| 80° | 1047 | 964  | 963  |
| 85° | 757  | 659  | 647  |

**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°    | 290.1   | 1.5       |
| 10°-20°   | 816.3   | 4.3       |
| 20°-30°   | 1199.6  | 6.4       |
| 30°-40°   | 1393.3  | 7.4       |
| 40°-50°   | 1391.5  | 7.4       |
| 50°-60°   | 1213.4  | 6.4       |
| 60°-70°   | 897.0   | 4.8       |
| 70°-80°   | 507.5   | 2.7       |
| 80°-90°   | 140.5   | 0.7       |
| 90°-100°  | 123.4   | 0.7       |
| 100°-110° | 460.1   | 2.4       |
| 110°-120° | 1220.2  | 6.5       |
| 120°-130° | 2023.8  | 10.8      |
| 130°-140° | 2149.8  | 11.4      |
| 140°-150° | 1998.0  | 10.6      |
| 150°-160° | 1606.3  | 8.5       |
| 160°-170° | 1035.1  | 5.5       |
| 170°-180° | 356.3   | 1.9       |
| 0°-30°    | 2306.0  | 12.3      |
| 0°-40°    | 3699.3  | 19.7      |
| 0°-60°    | 6304.2  | 33.5      |
| 0°-90°    | 7849.2  | 41.7      |
| 90°-120°  | 1803.7  | 9.6       |
| 90°-150°  | 7975.4  | 42.4      |
| 90°-180°  | 10973.0 | 58.3      |
| 0°-180°   | 18822.2 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 3082 | 3082  | 3082 | 3082  | 3082 |      |
| 5°   | 3082 | 3071  | 3038 | 3062  | 3056 | 293  |
| 15°  | 2934 | 2917  | 2878 | 2890  | 2875 | 826  |
| 25°  | 2656 | 2632  | 2582 | 2587  | 2582 | 1222 |
| 35°  | 2291 | 2262  | 2214 | 2196  | 2181 | 1431 |
| 45°  | 1864 | 1844  | 1799 | 1767  | 1755 | 1439 |
| 55°  | 1411 | 1393  | 1358 | 1322  | 1307 | 1262 |
| 65°  | 952  | 934   | 904  | 877   | 863  | 941  |
| 75°  | 498  | 492   | 477  | 460   | 465  | 531  |
| 85°  | 121  | 119   | 116  | 107   | 104  | 135  |
| 90°  | 2    | 32    | 54   | 68    | 73   | 17   |
| 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°     | 3082.5 | 3082.5 | 3082.5 | 3082.5 | 3082.5 |
| 2.5°   | 3100.4 | 3085.5 | 3052.8 | 3082.5 | 3076.8 |
| 5°     | 3082.5 | 3070.8 | 3038.1 | 3061.7 | 3056.0 |
| 7.5°   | 3061.7 | 3044.0 | 3011.3 | 3035.2 | 3029.3 |
| 10°    | 3029.3 | 3008.5 | 2973.0 | 2996.6 | 2987.8 |
| 12.5°  | 2984.6 | 2967.0 | 2931.5 | 2946.3 | 2940.3 |
| 15°    | 2934.3 | 2916.7 | 2878.0 | 2890.0 | 2875.2 |
| 17.5°  | 2872.1 | 2854.5 | 2815.7 | 2830.5 | 2815.7 |
| 20°    | 2803.8 | 2786.2 | 2744.7 | 2753.5 | 2741.8 |
| 22.5°  | 2735.9 | 2709.2 | 2670.4 | 2670.4 | 2664.5 |
| 25°    | 2655.7 | 2632.1 | 2581.8 | 2587.4 | 2581.8 |
| 27.5°  | 2566.7 | 2545.9 | 2507.6 | 2498.8 | 2484.0 |
| 30°    | 2478.0 | 2454.1 | 2409.7 | 2400.9 | 2389.0 |
| 32.5°  | 2383.0 | 2365.5 | 2317.9 | 2300.0 | 2288.1 |
| 35°    | 2291.2 | 2261.7 | 2214.1 | 2196.2 | 2181.4 |
| 37.5°  | 2187.4 | 2160.7 | 2113.2 | 2092.5 | 2077.7 |
| 40°    | 2080.8 | 2056.9 | 2009.4 | 1983.1 | 1971.1 |
| 42.5°  | 1977.0 | 1953.1 | 1906.0 | 1876.1 | 1858.5 |
| 45°    | 1864.5 | 1843.7 | 1799.0 | 1766.6 | 1754.8 |
| 47.5°  | 1754.8 | 1734.0 | 1686.5 | 1653.8 | 1636.2 |
| 50°    | 1639.0 | 1624.2 | 1582.7 | 1541.2 | 1526.5 |
| 52.5°  | 1526.5 | 1505.7 | 1467.3 | 1434.6 | 1413.9 |
| 55°    | 1411.0 | 1393.1 | 1357.6 | 1322.0 | 1307.3 |
| 57.5°  | 1295.3 | 1280.5 | 1241.8 | 1206.3 | 1194.4 |
| 60°    | 1179.6 | 1167.9 | 1126.4 | 1093.7 | 1084.9 |
| 62.5°  | 1067.0 | 1046.2 | 1016.7 | 987.1  | 975.2  |
| 65°    | 951.6  | 933.7  | 904.1  | 877.3  | 862.6  |
| 67.5°  | 833.1  | 817.9  | 791.5  | 770.8  | 758.8  |
| 70°    | 723.3  | 711.3  | 684.6  | 663.8  | 652.2  |
| 72.5°  | 610.7  | 598.7  | 584.0  | 563.2  | 554.4  |
| 75°    | 497.8  | 492.2  | 477.1  | 459.5  | 465.4  |
| 77.5°  | 397.2  | 385.2  | 379.2  | 370.4  | 361.6  |
| 80°    | 296.5  | 293.4  | 287.4  | 278.6  | 272.7  |
| 82.5°  | 201.6  | 201.6  | 198.8  | 186.8  | 186.8  |
| 85°    | 121.4  | 118.6  | 115.7  | 106.6  | 103.8  |
| 87.5°  | 53.5   | 47.5   | 41.5   | 32.7   | 29.5   |
| 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 | 9.15             | 9.94  | 10.17 | 10.97 | 12.36 | 8.70           | 9.49  | 9.73  | 10.53 | 11.91 |
|                 | 3H   | 10.81            | 11.51 | 11.84 | 12.56 | 13.96 | 10.31          | 11.02 | 11.35 | 12.07 | 13.47 |
|                 | 4H   | 11.39            | 12.06 | 12.44 | 13.11 | 14.52 | 10.90          | 11.57 | 11.95 | 12.62 | 14.03 |
|                 | 6H   | 11.79            | 12.41 | 12.85 | 13.46 | 14.88 | 11.29          | 11.91 | 12.35 | 12.96 | 14.38 |
|                 | 8H   | 11.90            | 12.49 | 12.96 | 13.55 | 14.97 | 11.39          | 11.98 | 12.46 | 13.05 | 14.47 |
|                 | 12H  | 11.94            | 12.50 | 13.01 | 13.56 | 15.01 | 11.43          | 11.99 | 12.50 | 13.05 | 14.50 |
| 4H              | 2H   | 9.60             | 10.27 | 10.65 | 11.32 | 12.73 | 9.24           | 9.92  | 10.30 | 10.96 | 12.37 |
|                 | 3H   | 11.46            | 12.02 | 12.52 | 13.10 | 14.52 | 11.06          | 11.62 | 12.12 | 12.69 | 14.11 |
|                 | 4H   | 12.18            | 12.69 | 13.25 | 13.76 | 15.20 | 11.75          | 12.27 | 12.82 | 13.33 | 14.78 |
|                 | 6H   | 12.69            | 13.14 | 13.77 | 14.22 | 15.66 | 12.26          | 12.70 | 13.34 | 13.79 | 15.23 |
|                 | 8H   | 12.84            | 13.26 | 13.92 | 14.34 | 15.79 | 12.41          | 12.82 | 13.48 | 13.90 | 15.35 |
|                 | 12H  | 12.92            | 13.29 | 14.01 | 14.38 | 15.84 | 12.47          | 12.84 | 13.56 | 13.93 | 15.39 |
| 8H              | 4H   | 12.37            | 12.78 | 13.45 | 13.86 | 15.32 | 11.99          | 12.41 | 13.07 | 13.48 | 14.94 |
|                 | 6H   | 13.00            | 13.34 | 14.10 | 14.46 | 15.92 | 12.62          | 12.96 | 13.72 | 14.08 | 15.53 |
|                 | 8H   | 13.23            | 13.52 | 14.33 | 14.63 | 16.10 | 12.83          | 13.13 | 13.94 | 14.23 | 15.71 |
|                 | 12H  | 13.36            | 13.62 | 14.47 | 14.72 | 16.23 | 12.95          | 13.21 | 14.06 | 14.31 | 15.82 |
| 12H             | 4H   | 12.35            | 12.72 | 13.45 | 13.82 | 15.28 | 11.98          | 12.36 | 13.08 | 13.45 | 14.91 |
|                 | 6H   | 13.03            | 13.33 | 14.14 | 14.43 | 15.91 | 12.66          | 12.96 | 13.77 | 14.06 | 15.54 |
|                 | 8H   | 13.27            | 13.54 | 14.38 | 14.64 | 16.15 | 12.89          | 13.16 | 14.00 | 14.26 | 15.77 |