

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: P919143

Luminaire Tested: DFN2DIP-HX4F0-080D120US935-RLLFLL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P919143  
REPORT IS A COMBINATION OF REPORTS P899452 AND P896188  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-HX4F0-080D120US935-RLLFLL  
Description: 4 foot, Hexagon Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

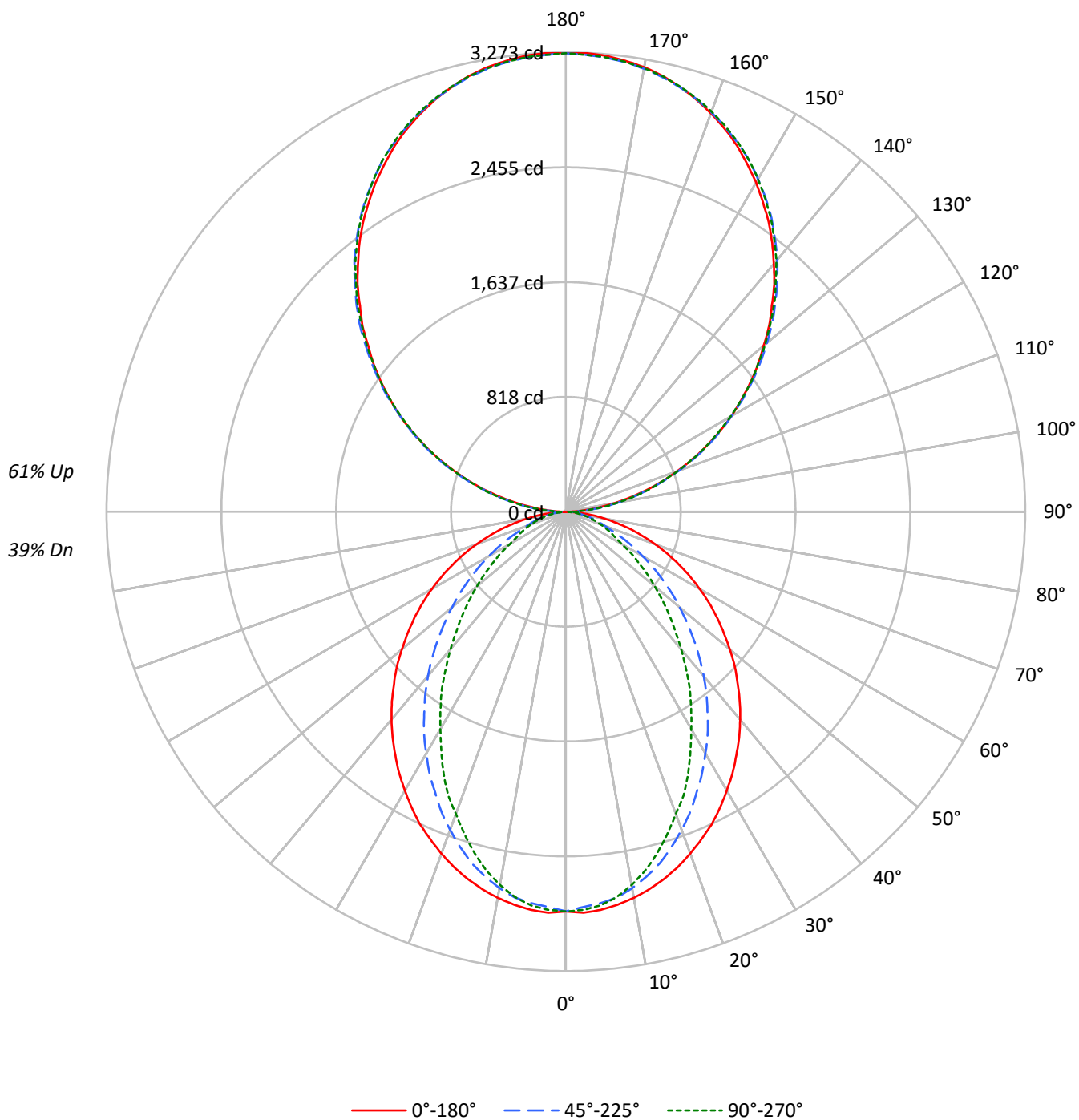
Lumens per Lamp: N/A  
Luminaire Lumens: 14998.6 lumens  
Efficiency: N/A  
Efficacy: 100.1 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 0.99 / 1.16  
Luminous Opening: Rectangular w/ Sides (W: 3.54' x L: 4.09' x H: 0.1')  
CIE Type: Semi-Indirect

Input Watts (W): 149.9  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9613  
Total Harmonic Distortion (THDi): 0.083  
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 | 95 | 95 | 95 | 95 | 77 | 77 | 77 | 61 | 61 | 61 | 46 | 46 | 46 |
| 1   | 96  | 92  | 88  | 85  | 87 | 83 | 80 | 78 | 68 | 66 | 64 | 54 | 53 | 51 | 41 | 40 | 40 |
| 2   | 87  | 80  | 75  | 70  | 79 | 73 | 68 | 64 | 60 | 57 | 54 | 48 | 46 | 44 | 37 | 35 | 34 |
| 3   | 80  | 71  | 64  | 58  | 73 | 65 | 59 | 54 | 53 | 49 | 46 | 43 | 40 | 37 | 33 | 31 | 29 |
| 4   | 73  | 63  | 55  | 50  | 66 | 58 | 51 | 46 | 48 | 43 | 39 | 38 | 35 | 32 | 30 | 27 | 26 |
| 5   | 67  | 56  | 48  | 43  | 61 | 52 | 45 | 40 | 43 | 38 | 34 | 35 | 31 | 28 | 27 | 24 | 22 |
| 6   | 62  | 51  | 43  | 37  | 56 | 46 | 40 | 35 | 39 | 33 | 30 | 31 | 28 | 25 | 25 | 22 | 20 |
| 7   | 57  | 46  | 38  | 33  | 52 | 42 | 35 | 30 | 35 | 30 | 26 | 29 | 25 | 22 | 22 | 20 | 18 |
| 8   | 53  | 41  | 34  | 29  | 49 | 38 | 32 | 27 | 32 | 27 | 23 | 26 | 22 | 20 | 21 | 18 | 16 |
| 9   | 50  | 38  | 31  | 26  | 45 | 35 | 29 | 24 | 29 | 24 | 21 | 24 | 20 | 18 | 19 | 17 | 15 |
| 10  | 46  | 35  | 28  | 23  | 42 | 32 | 26 | 22 | 27 | 22 | 19 | 22 | 19 | 16 | 18 | 15 | 13 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 2117 | 2117 | 2117 |
| 5°  | 2120 | 2083 | 2097 |
| 10° | 2099 | 2043 | 2028 |
| 15° | 2071 | 1975 | 1923 |
| 20° | 2033 | 1883 | 1794 |
| 25° | 1994 | 1778 | 1669 |
| 30° | 1941 | 1672 | 1510 |
| 35° | 1890 | 1557 | 1371 |
| 40° | 1838 | 1438 | 1212 |
| 45° | 1777 | 1306 | 1067 |
| 50° | 1714 | 1173 | 926  |
| 55° | 1649 | 1030 | 790  |
| 60° | 1573 | 882  | 650  |
| 65° | 1486 | 730  | 585  |
| 70° | 1380 | 589  | 530  |
| 75° | 1248 | 520  | 482  |
| 80° | 1056 | 437  | 419  |
| 85° | 738  | 293  | 315  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 90°

Vertical Angle: 90°

Luminance: 2464 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 266.8   | 1.8       |
| 10°-20°   | 732.4   | 4.9       |
| 20°-30°   | 1028.3  | 6.9       |
| 30°-40°   | 1120.9  | 7.5       |
| 40°-50°   | 1030.3  | 6.9       |
| 50°-60°   | 809.1   | 5.4       |
| 60°-70°   | 526.6   | 3.5       |
| 70°-80°   | 271.1   | 1.8       |
| 80°-90°   | 78.5    | 0.5       |
| 90°-100°  | 202.2   | 1.3       |
| 100°-110° | 642.4   | 4.3       |
| 110°-120° | 1099.4  | 7.3       |
| 120°-130° | 1445.9  | 9.6       |
| 130°-140° | 1623.0  | 10.8      |
| 140°-150° | 1591.6  | 10.6      |
| 150°-160° | 1335.1  | 8.9       |
| 160°-170° | 885.4   | 5.9       |
| 170°-180° | 309.5   | 2.1       |
| 0°-30°    | 2027.6  | 13.5      |
| 0°-40°    | 3148.5  | 21.0      |
| 0°-60°    | 4987.8  | 33.3      |
| 0°-90°    | 5864.1  | 39.1      |
| 90°-120°  | 1944.1  | 13.0      |
| 90°-150°  | 6604.6  | 44.0      |
| 90°-180°  | 9134.0  | 60.9      |
| 0°-180°   | 14998.6 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 2847 | 2847  | 2847 | 2847  | 2847 |      |
| 5°   | 2847 | 2834  | 2800 | 2824  | 2816 | 270  |
| 15°  | 2708 | 2679  | 2592 | 2543  | 2517 | 763  |
| 25°  | 2458 | 2375  | 2205 | 2100  | 2061 | 1130 |
| 35°  | 2118 | 1986  | 1760 | 1597  | 1540 | 1326 |
| 45°  | 1731 | 1559  | 1288 | 1105  | 1043 | 1337 |
| 55°  | 1316 | 1116  | 837  | 683   | 634  | 1176 |
| 65°  | 889  | 680   | 448  | 361   | 353  | 881  |
| 75°  | 474  | 294   | 206  | 188   | 186  | 501  |
| 85°  | 111  | 57    | 49   | 49    | 49   | 127  |
| 90°  | 3    | 36    | 96   | 91    | 94   | 15   |
| 95°  | 144  | 171   | 176  | 176   | 171  | 160  |
| 105° | 593  | 601   | 607  | 612   | 612  | 626  |
| 115° | 1103 | 1119  | 1114 | 1111  | 1103 | 1091 |
| 125° | 1605 | 1629  | 1622 | 1613  | 1610 | 1434 |
| 135° | 2076 | 2106  | 2112 | 2109  | 2101 | 1604 |
| 145° | 2520 | 2540  | 2555 | 2558  | 2548 | 1574 |
| 155° | 2881 | 2889  | 2898 | 2912  | 2903 | 1326 |
| 165° | 3135 | 3132  | 3132 | 3151  | 3138 | 884  |
| 175° | 3262 | 3254  | 3248 | 3268  | 3251 | 310  |
| 180° | 3268 | 3268  | 3268 | 3268  | 3268 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 2846.8 | 2846.8 | 2846.8 | 2846.8 | 2846.8 |
| 2.5°   | 2859.6 | 2846.8 | 2818.4 | 2844.3 | 2839.1 |
| 5°     | 2846.8 | 2834.0 | 2800.3 | 2823.6 | 2815.9 |
| 7.5°   | 2823.6 | 2808.2 | 2772.2 | 2782.3 | 2769.4 |
| 10°    | 2792.6 | 2774.7 | 2723.3 | 2715.3 | 2700.0 |
| 12.5°  | 2754.2 | 2730.9 | 2661.2 | 2645.8 | 2617.4 |
| 15°    | 2707.7 | 2679.3 | 2591.8 | 2542.9 | 2517.1 |
| 17.5°  | 2653.5 | 2612.3 | 2504.0 | 2447.5 | 2406.1 |
| 20°    | 2591.8 | 2540.1 | 2411.4 | 2347.2 | 2290.3 |
| 22.5°  | 2524.8 | 2465.5 | 2316.0 | 2228.5 | 2189.9 |
| 25°    | 2457.8 | 2375.3 | 2205.3 | 2099.8 | 2061.0 |
| 27.5°  | 2378.0 | 2290.3 | 2102.2 | 1981.2 | 1921.8 |
| 30°    | 2293.0 | 2194.9 | 1988.8 | 1857.6 | 1787.9 |
| 32.5°  | 2210.4 | 2091.9 | 1880.8 | 1726.1 | 1661.6 |
| 35°    | 2117.8 | 1986.3 | 1759.7 | 1597.4 | 1540.5 |
| 37.5°  | 2027.6 | 1885.8 | 1646.3 | 1468.3 | 1404.1 |
| 40°    | 1932.3 | 1777.8 | 1527.7 | 1344.8 | 1277.8 |
| 42.5°  | 1834.4 | 1669.6 | 1409.3 | 1218.6 | 1154.3 |
| 45°    | 1731.3 | 1558.6 | 1288.2 | 1105.1 | 1043.4 |
| 47.5°  | 1633.5 | 1450.6 | 1172.3 | 989.2  | 932.6  |
| 50°    | 1525.2 | 1342.4 | 1058.9 | 881.0  | 827.1  |
| 52.5°  | 1419.4 | 1226.1 | 950.6  | 780.7  | 731.8  |
| 55°    | 1316.4 | 1115.5 | 837.2  | 682.8  | 633.9  |
| 57.5°  | 1210.9 | 1004.8 | 736.9  | 592.6  | 551.3  |
| 60°    | 1102.6 | 896.6  | 631.1  | 499.9  | 458.7  |
| 62.5°  | 997.1  | 791.0  | 541.0  | 417.4  | 396.9  |
| 65°    | 888.9  | 680.0  | 448.2  | 360.8  | 352.8  |
| 67.5°  | 785.8  | 577.0  | 360.8  | 316.8  | 309.2  |
| 70°    | 677.6  | 476.7  | 298.8  | 273.0  | 262.7  |
| 72.5°  | 574.5  | 383.7  | 249.9  | 229.4  | 224.1  |
| 75°    | 474.0  | 293.6  | 206.1  | 188.0  | 185.6  |
| 77.5°  | 373.7  | 208.5  | 162.4  | 152.0  | 146.8  |
| 80°    | 280.7  | 149.6  | 123.6  | 113.4  | 113.4  |
| 82.5°  | 195.7  | 100.6  | 85.0   | 79.8   | 79.8   |
| 85°    | 110.7  | 56.6   | 48.9   | 48.9   | 48.9   |
| 87.5°  | 41.2   | 20.5   | 20.5   | 18.1   | 18.1   |
| 90°    | 2.9    | 35.5   | 96.5   | 90.7   | 93.6   |
| 92.5°  | 61.0   | 82.7   | 85.7   | 88.7   | 88.7   |
| 95°    | 143.8  | 171.4  | 176.3  | 176.3  | 171.4  |
| 97.5°  | 239.4  | 265.0  | 275.9  | 275.9  | 275.9  |
| 100°   | 349.7  | 372.4  | 380.2  | 380.2  | 377.3  |
| 102.5° | 466.0  | 482.7  | 493.5  | 496.5  | 493.5  |
| 105°   | 593.1  | 600.9  | 606.8  | 611.7  | 611.7  |
| 107.5° | 719.1  | 731.0  | 731.0  | 732.9  | 719.1  |
| 110°   | 841.3  | 857.0  | 857.0  | 857.0  | 849.2  |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 973.3  | 990.1  | 987.0  | 979.2  | 973.3  |
| 115°   | 1103.3 | 1119.1 | 1114.1 | 1111.2 | 1103.3 |
| 117.5° | 1232.3 | 1254.0 | 1240.3 | 1232.3 | 1224.5 |
| 120°   | 1362.4 | 1384.1 | 1362.4 | 1362.4 | 1353.6 |
| 122.5° | 1480.7 | 1508.2 | 1494.4 | 1486.5 | 1480.7 |
| 125°   | 1604.7 | 1629.4 | 1621.5 | 1612.6 | 1609.6 |
| 127.5° | 1726.0 | 1756.4 | 1745.6 | 1733.8 | 1726.0 |
| 130°   | 1839.2 | 1874.7 | 1869.7 | 1863.8 | 1853.0 |
| 132.5° | 1966.3 | 1993.9 | 1995.8 | 1982.0 | 1974.2 |
| 135°   | 2075.6 | 2106.2 | 2112.1 | 2109.1 | 2101.3 |
| 137.5° | 2197.8 | 2222.4 | 2227.3 | 2225.3 | 2213.5 |
| 140°   | 2305.1 | 2329.8 | 2343.6 | 2343.6 | 2332.7 |
| 142.5° | 2415.5 | 2440.2 | 2448.0 | 2450.9 | 2440.2 |
| 145°   | 2519.9 | 2539.6 | 2555.4 | 2558.4 | 2547.5 |
| 147.5° | 2613.5 | 2638.1 | 2650.0 | 2654.9 | 2644.0 |
| 150°   | 2710.1 | 2726.8 | 2737.6 | 2746.5 | 2737.6 |
| 152.5° | 2795.7 | 2812.4 | 2826.3 | 2837.2 | 2826.3 |
| 155°   | 2881.4 | 2889.3 | 2898.2 | 2912.0 | 2903.1 |
| 157.5° | 2955.4 | 2961.2 | 2966.1 | 2985.9 | 2972.1 |
| 160°   | 3021.3 | 3027.3 | 3030.2 | 3047.0 | 3035.1 |
| 162.5° | 3082.4 | 3082.4 | 3085.4 | 3104.1 | 3090.3 |
| 165°   | 3134.6 | 3131.7 | 3131.7 | 3151.3 | 3137.6 |
| 167.5° | 3181.9 | 3173.0 | 3173.0 | 3192.8 | 3179.0 |
| 170°   | 3217.4 | 3209.5 | 3206.5 | 3226.2 | 3209.5 |
| 172.5° | 3242.0 | 3234.1 | 3231.2 | 3250.9 | 3234.1 |
| 175°   | 3261.7 | 3253.8 | 3247.9 | 3267.6 | 3250.9 |
| 177.5° | 3272.6 | 3264.6 | 3258.7 | 3275.5 | 3258.7 |
| 180°   | 3267.6 | 3267.6 | 3267.6 | 3267.6 | 3267.6 |

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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 | 8.64             | 9.39  | 9.69  | 10.44 | 11.86 | 4.61           | 5.36 | 5.66 | 6.41 | 7.84  |
|                 | 3H   | 10.31            | 10.98 | 11.37 | 12.04 | 13.48 | 5.80           | 6.47 | 6.86 | 7.53 | 8.97  |
|                 | 4H   | 10.92            | 11.55 | 11.99 | 12.61 | 14.06 | 6.25           | 6.88 | 7.32 | 7.94 | 9.39  |
|                 | 6H   | 11.34            | 11.92 | 12.42 | 12.99 | 14.44 | 6.56           | 7.15 | 7.65 | 8.21 | 9.67  |
|                 | 8H   | 11.46            | 12.02 | 12.55 | 13.10 | 14.55 | 6.65           | 7.21 | 7.74 | 8.29 | 9.74  |
|                 | 12H  | 11.52            | 12.05 | 12.61 | 13.12 | 14.60 | 6.69           | 7.22 | 7.78 | 8.30 | 9.77  |
| 4H              | 2H   | 8.65             | 9.28  | 9.73  | 10.35 | 11.79 | 5.20           | 5.83 | 6.28 | 6.90 | 8.34  |
|                 | 3H   | 10.47            | 11.00 | 11.56 | 12.09 | 13.55 | 6.54           | 7.07 | 7.63 | 8.16 | 9.62  |
|                 | 4H   | 11.16            | 11.64 | 12.25 | 12.73 | 14.21 | 7.09           | 7.57 | 8.18 | 8.65 | 10.13 |
|                 | 6H   | 11.67            | 12.09 | 12.77 | 13.19 | 14.67 | 7.51           | 7.92 | 8.61 | 9.02 | 10.50 |
|                 | 8H   | 11.85            | 12.23 | 12.95 | 13.33 | 14.82 | 7.64           | 8.02 | 8.73 | 9.12 | 10.61 |
|                 | 12H  | 11.94            | 12.29 | 13.06 | 13.40 | 14.89 | 7.70           | 8.05 | 8.81 | 9.16 | 10.65 |
| 8H              | 4H   | 11.12            | 11.51 | 12.22 | 12.61 | 14.10 | 7.36           | 7.75 | 8.46 | 8.85 | 10.34 |
|                 | 6H   | 11.69            | 12.01 | 12.81 | 13.14 | 14.63 | 7.88           | 8.20 | 9.00 | 9.34 | 10.83 |
|                 | 8H   | 11.91            | 12.18 | 13.03 | 13.30 | 14.81 | 8.07           | 8.35 | 9.20 | 9.47 | 10.98 |
|                 | 12H  | 12.04            | 12.29 | 13.17 | 13.40 | 14.95 | 8.19           | 8.44 | 9.32 | 9.55 | 11.10 |
| 12H             | 4H   | 11.07            | 11.42 | 12.19 | 12.53 | 14.02 | 7.37           | 7.72 | 8.48 | 8.82 | 10.32 |
|                 | 6H   | 11.66            | 11.94 | 12.79 | 13.06 | 14.57 | 7.93           | 8.21 | 9.06 | 9.33 | 10.84 |
|                 | 8H   | 11.88            | 12.13 | 13.01 | 13.24 | 14.79 | 8.14           | 8.39 | 9.27 | 9.50 | 11.05 |