

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: P909238

Luminaire Tested: DFN2DIP-SQ3F0-080D100US840-RLLFLL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P909238  
REPORT IS A COMBINATION OF REPORTS P899978 AND P896733  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-SQ3F0-080D100US840-RLLFLL  
Description: 3 foot, Square Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

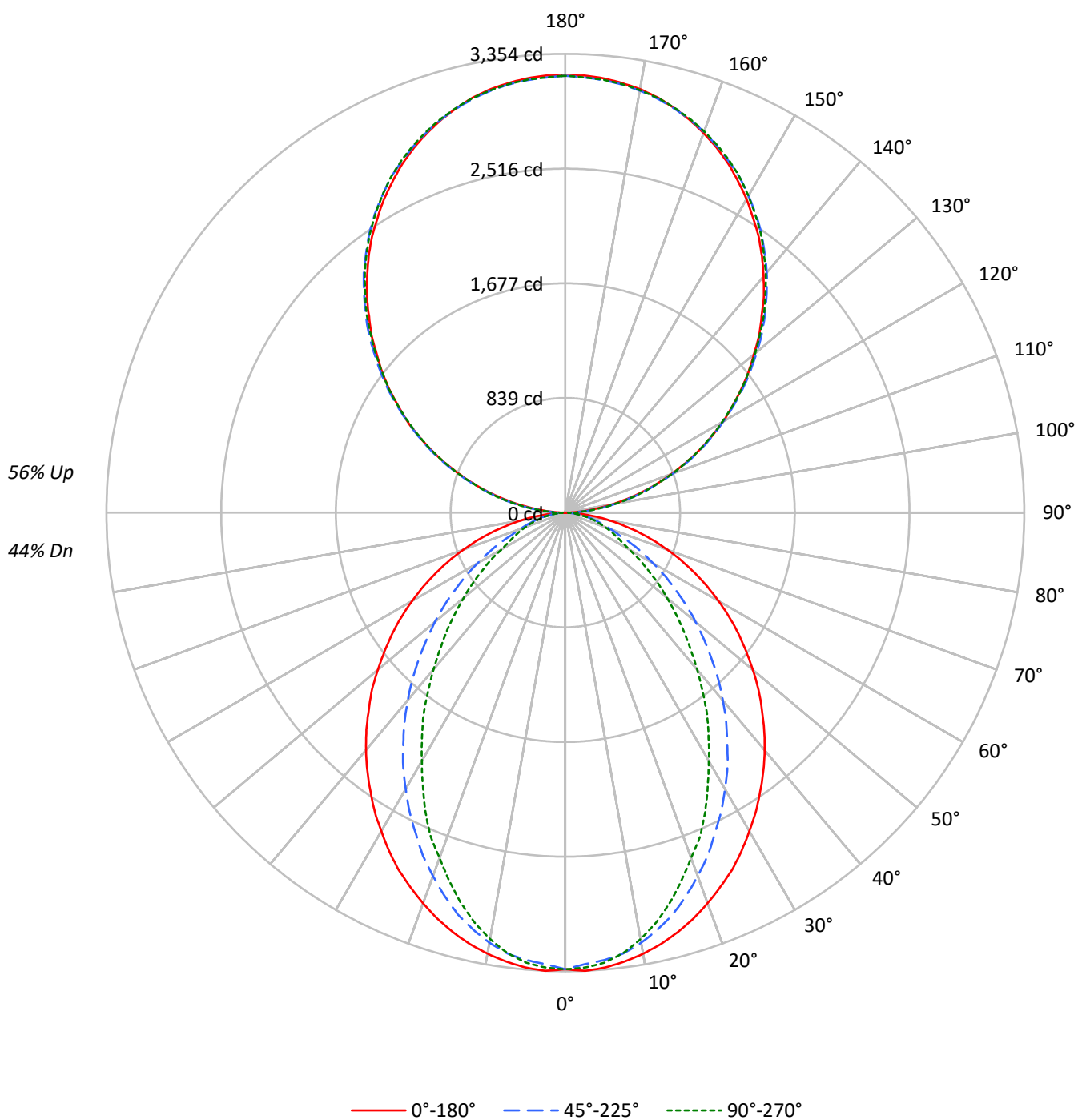
Lumens per Lamp: N/A  
Luminaire Lumens: 15804.4 lumens  
Efficiency: N/A  
Efficacy: 102.8 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 0.99 / 1.16  
Luminous Opening: Rectangular w/ Sides (W: 3.06' x L: 3.06' x H: 0.1')  
CIE Type: General Diffuse

Input Watts (W): 153.7  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9952  
Total Harmonic Distortion (THDi): 0.069  
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: P909238

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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   | 106 | 106 | 106 | 106 | 97 | 97 | 97 | 97 | 80 | 80 | 80 | 64 | 64 | 64 | 50 | 50 | 50 |
| 1   | 97  | 93  | 89  | 86  | 88 | 85 | 82 | 79 | 70 | 68 | 66 | 57 | 56 | 54 | 45 | 44 | 43 |
| 2   | 88  | 81  | 75  | 71  | 81 | 75 | 70 | 65 | 62 | 59 | 55 | 51 | 48 | 46 | 40 | 38 | 37 |
| 3   | 81  | 72  | 65  | 59  | 74 | 66 | 60 | 55 | 55 | 51 | 47 | 45 | 42 | 39 | 36 | 34 | 32 |
| 4   | 74  | 64  | 56  | 50  | 68 | 59 | 52 | 47 | 49 | 44 | 40 | 41 | 37 | 34 | 32 | 30 | 28 |
| 5   | 68  | 57  | 49  | 43  | 62 | 53 | 46 | 41 | 44 | 39 | 35 | 37 | 33 | 30 | 29 | 27 | 25 |
| 6   | 63  | 51  | 43  | 38  | 57 | 47 | 41 | 35 | 40 | 35 | 31 | 33 | 29 | 26 | 27 | 24 | 22 |
| 7   | 58  | 46  | 39  | 33  | 53 | 43 | 36 | 31 | 36 | 31 | 27 | 30 | 26 | 23 | 25 | 22 | 20 |
| 8   | 54  | 42  | 35  | 30  | 50 | 39 | 32 | 28 | 33 | 28 | 24 | 28 | 24 | 21 | 23 | 20 | 18 |
| 9   | 50  | 39  | 31  | 26  | 46 | 36 | 29 | 25 | 31 | 25 | 22 | 26 | 22 | 19 | 21 | 18 | 16 |
| 10  | 47  | 35  | 28  | 24  | 43 | 33 | 27 | 22 | 28 | 23 | 20 | 24 | 20 | 17 | 19 | 17 | 15 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 3826 | 3826 | 3826 |
| 5°  | 3830 | 3763 | 3788 |
| 10° | 3789 | 3686 | 3663 |
| 15° | 3735 | 3562 | 3472 |
| 20° | 3663 | 3392 | 3237 |
| 25° | 3590 | 3201 | 3010 |
| 30° | 3493 | 3006 | 2723 |
| 35° | 3397 | 2797 | 2471 |
| 40° | 3299 | 2580 | 2182 |
| 45° | 3186 | 2340 | 1920 |
| 50° | 3069 | 2099 | 1665 |
| 55° | 2947 | 1840 | 1419 |
| 60° | 2805 | 1571 | 1167 |
| 65° | 2642 | 1297 | 1049 |
| 70° | 2444 | 1042 | 947  |
| 75° | 2194 | 913  | 859  |
| 80° | 1833 | 758  | 741  |
| 85° | 1244 | 494  | 550  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 90°

Vertical Angle: 90°

Luminance: 3213 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 312.9   | 2.0       |
| 10°-20°   | 859.1   | 5.4       |
| 20°-30°   | 1206.1  | 7.6       |
| 30°-40°   | 1314.7  | 8.3       |
| 40°-50°   | 1208.4  | 7.6       |
| 50°-60°   | 949.0   | 6.0       |
| 60°-70°   | 617.7   | 3.9       |
| 70°-80°   | 318.0   | 2.0       |
| 80°-90°   | 90.2    | 0.6       |
| 90°-100°  | 197.6   | 1.3       |
| 100°-110° | 627.9   | 4.0       |
| 110°-120° | 1074.6  | 6.8       |
| 120°-130° | 1413.3  | 8.9       |
| 130°-140° | 1586.4  | 10.0      |
| 140°-150° | 1555.6  | 9.8       |
| 150°-160° | 1304.9  | 8.3       |
| 160°-170° | 865.4   | 5.5       |
| 170°-180° | 302.5   | 1.9       |
| 0°-30°    | 2378.1  | 15.0      |
| 0°-40°    | 3692.9  | 23.4      |
| 0°-60°    | 5850.2  | 37.0      |
| 0°-90°    | 6876.2  | 43.5      |
| 90°-120°  | 1900.2  | 12.0      |
| 90°-150°  | 6455.4  | 40.8      |
| 90°-180°  | 8928.0  | 56.5      |
| 0°-180°   | 15804.4 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 3339 | 3339  | 3339 | 3339  | 3339 |      |
| 5°   | 3339 | 3324  | 3284 | 3312  | 3303 | 317  |
| 15°  | 3176 | 3142  | 3040 | 2982  | 2952 | 895  |
| 25°  | 2883 | 2786  | 2587 | 2463  | 2417 | 1326 |
| 35°  | 2484 | 2330  | 2064 | 1874  | 1807 | 1555 |
| 45°  | 2031 | 1828  | 1511 | 1296  | 1224 | 1568 |
| 55°  | 1544 | 1308  | 982  | 801   | 744  | 1380 |
| 65°  | 1043 | 798   | 526  | 423   | 414  | 1034 |
| 75°  | 556  | 344   | 242  | 221   | 218  | 588  |
| 85°  | 130  | 66    | 57   | 57    | 57   | 149  |
| 90°  | 3    | 35    | 94   | 89    | 92   | 16   |
| 95°  | 141  | 168   | 172  | 172   | 168  | 156  |
| 105° | 580  | 587   | 593  | 598   | 598  | 612  |
| 115° | 1078 | 1094  | 1089 | 1086  | 1078 | 1067 |
| 125° | 1568 | 1593  | 1585 | 1576  | 1573 | 1402 |
| 135° | 2029 | 2059  | 2064 | 2062  | 2054 | 1568 |
| 145° | 2463 | 2482  | 2498 | 2500  | 2490 | 1539 |
| 155° | 2816 | 2824  | 2833 | 2846  | 2838 | 1296 |
| 165° | 3064 | 3061  | 3061 | 3080  | 3067 | 864  |
| 175° | 3188 | 3180  | 3175 | 3194  | 3177 | 303  |
| 180° | 3194 | 3194  | 3194 | 3194  | 3194 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 3339.0 | 3339.0 | 3339.0 | 3339.0 | 3339.0 |
| 2.5°   | 3354.1 | 3339.0 | 3305.7 | 3336.1 | 3330.0 |
| 5°     | 3339.0 | 3324.0 | 3284.5 | 3311.8 | 3302.8 |
| 7.5°   | 3311.8 | 3293.8 | 3251.5 | 3263.4 | 3248.2 |
| 10°    | 3275.5 | 3254.4 | 3194.1 | 3184.8 | 3166.8 |
| 12.5°  | 3230.4 | 3203.1 | 3121.3 | 3103.3 | 3070.0 |
| 15°    | 3175.8 | 3142.5 | 3039.9 | 2982.5 | 2952.3 |
| 17.5°  | 3112.3 | 3063.9 | 2937.0 | 2870.6 | 2822.2 |
| 20°    | 3039.9 | 2979.3 | 2828.3 | 2753.0 | 2686.2 |
| 22.5°  | 2961.3 | 2891.7 | 2716.4 | 2613.8 | 2568.6 |
| 25°    | 2882.8 | 2786.0 | 2586.6 | 2462.9 | 2417.3 |
| 27.5°  | 2789.1 | 2686.2 | 2465.7 | 2323.7 | 2254.1 |
| 30°    | 2689.5 | 2574.3 | 2332.7 | 2178.8 | 2097.0 |
| 32.5°  | 2592.6 | 2453.6 | 2206.1 | 2024.6 | 1948.9 |
| 35°    | 2484.0 | 2329.8 | 2064.0 | 1873.6 | 1806.9 |
| 37.5°  | 2378.1 | 2211.8 | 1931.0 | 1722.2 | 1646.9 |
| 40°    | 2266.3 | 2085.2 | 1791.8 | 1577.3 | 1498.7 |
| 42.5°  | 2151.5 | 1958.2 | 1652.9 | 1429.3 | 1353.8 |
| 45°    | 2030.6 | 1828.1 | 1511.0 | 1296.2 | 1223.8 |
| 47.5°  | 1915.9 | 1701.4 | 1375.0 | 1160.2 | 1093.9 |
| 50°    | 1788.9 | 1574.5 | 1242.0 | 1033.3 | 970.1  |
| 52.5°  | 1664.9 | 1438.1 | 1115.0 | 915.6  | 858.3  |
| 55°    | 1544.0 | 1308.4 | 982.0  | 800.8  | 743.5  |
| 57.5°  | 1420.3 | 1178.5 | 864.3  | 695.1  | 646.6  |
| 60°    | 1293.2 | 1051.6 | 740.2  | 586.3  | 538.0  |
| 62.5°  | 1169.5 | 927.8  | 634.5  | 489.6  | 465.5  |
| 65°    | 1042.6 | 797.6  | 525.7  | 423.2  | 413.8  |
| 67.5°  | 921.7  | 676.8  | 423.2  | 371.5  | 362.6  |
| 70°    | 794.8  | 559.2  | 350.4  | 320.2  | 308.1  |
| 72.5°  | 673.9  | 450.1  | 293.1  | 269.0  | 262.9  |
| 75°    | 555.9  | 344.4  | 241.8  | 220.6  | 217.7  |
| 77.5°  | 438.3  | 244.6  | 190.5  | 178.2  | 172.2  |
| 80°    | 329.2  | 175.4  | 144.9  | 133.0  | 133.0  |
| 82.5°  | 229.5  | 118.0  | 99.7   | 93.6   | 93.6   |
| 85°    | 129.9  | 66.3   | 57.4   | 57.4   | 57.4   |
| 87.5°  | 48.4   | 24.0   | 24.0   | 21.2   | 21.2   |
| 90°    | 2.9    | 34.6   | 94.3   | 88.6   | 91.5   |
| 92.5°  | 59.7   | 80.9   | 83.8   | 86.6   | 86.6   |
| 95°    | 140.6  | 167.5  | 172.4  | 172.4  | 167.5  |
| 97.5°  | 234.0  | 259.0  | 269.6  | 269.6  | 269.6  |
| 100°   | 341.8  | 364.0  | 371.6  | 371.6  | 368.8  |
| 102.5° | 455.4  | 471.8  | 482.4  | 485.2  | 482.4  |
| 105°   | 579.7  | 587.3  | 593.1  | 597.9  | 597.9  |
| 107.5° | 702.9  | 714.5  | 714.5  | 716.4  | 702.9  |
| 110°   | 822.3  | 837.7  | 837.7  | 837.7  | 830.0  |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 951.3  | 967.7  | 964.8  | 957.0  | 951.3  |
| 115°   | 1078.4 | 1093.8 | 1089.0 | 1086.1 | 1078.4 |
| 117.5° | 1204.6 | 1225.8 | 1212.2 | 1204.6 | 1196.8 |
| 120°   | 1331.6 | 1352.8 | 1331.6 | 1331.6 | 1323.0 |
| 122.5° | 1447.1 | 1474.1 | 1460.7 | 1453.0 | 1447.1 |
| 125°   | 1568.5 | 1592.6 | 1584.9 | 1576.2 | 1573.4 |
| 127.5° | 1687.0 | 1716.8 | 1706.2 | 1694.7 | 1687.0 |
| 130°   | 1797.7 | 1832.3 | 1827.6 | 1821.7 | 1811.2 |
| 132.5° | 1921.9 | 1948.8 | 1950.8 | 1937.3 | 1929.6 |
| 135°   | 2028.7 | 2058.6 | 2064.4 | 2061.5 | 2053.8 |
| 137.5° | 2148.2 | 2172.2 | 2177.1 | 2175.1 | 2163.5 |
| 140°   | 2253.1 | 2277.1 | 2290.7 | 2290.7 | 2280.1 |
| 142.5° | 2361.0 | 2385.0 | 2392.7 | 2395.6 | 2385.0 |
| 145°   | 2463.0 | 2482.2 | 2497.7 | 2500.5 | 2489.9 |
| 147.5° | 2554.5 | 2578.6 | 2590.1 | 2595.0 | 2584.3 |
| 150°   | 2648.9 | 2665.2 | 2675.8 | 2684.4 | 2675.8 |
| 152.5° | 2732.6 | 2749.0 | 2762.5 | 2773.1 | 2762.5 |
| 155°   | 2816.4 | 2824.1 | 2832.8 | 2846.2 | 2837.5 |
| 157.5° | 2888.6 | 2894.4 | 2899.2 | 2918.4 | 2905.0 |
| 160°   | 2953.1 | 2958.9 | 2961.7 | 2978.1 | 2966.6 |
| 162.5° | 3012.8 | 3012.8 | 3015.7 | 3033.9 | 3020.5 |
| 165°   | 3063.8 | 3060.9 | 3060.9 | 3080.2 | 3066.8 |
| 167.5° | 3110.1 | 3101.4 | 3101.4 | 3120.7 | 3107.2 |
| 170°   | 3144.7 | 3137.0 | 3134.1 | 3153.4 | 3137.0 |
| 172.5° | 3168.8 | 3161.1 | 3158.2 | 3177.4 | 3161.1 |
| 175°   | 3188.0 | 3180.4 | 3174.6 | 3193.8 | 3177.4 |
| 177.5° | 3198.6 | 3191.0 | 3185.1 | 3201.5 | 3185.1 |
| 180°   | 3193.8 | 3193.8 | 3193.8 | 3193.8 | 3193.8 |

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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 | 11.13            | 11.92 | 12.15 | 12.94 | 14.30 | 7.10           | 7.88  | 8.11  | 8.90  | 10.26 |
|                 | 3H   | 12.80            | 13.50 | 13.83 | 14.53 | 15.92 | 8.27           | 8.97  | 9.30  | 10.00 | 11.39 |
|                 | 4H   | 13.41            | 14.07 | 14.45 | 15.10 | 16.49 | 8.72           | 9.38  | 9.76  | 10.41 | 11.80 |
|                 | 6H   | 13.82            | 14.43 | 14.87 | 15.47 | 16.87 | 9.03           | 9.64  | 10.08 | 10.68 | 12.08 |
|                 | 8H   | 13.95            | 14.52 | 15.00 | 15.58 | 16.98 | 9.12           | 9.69  | 10.17 | 10.75 | 12.15 |
|                 | 12H  | 14.00            | 14.55 | 15.06 | 15.60 | 17.02 | 9.15           | 9.70  | 10.21 | 10.75 | 12.17 |
| 4H              | 2H   | 11.15            | 11.81 | 12.19 | 12.84 | 14.23 | 7.68           | 8.34  | 8.73  | 9.38  | 10.77 |
|                 | 3H   | 12.96            | 13.51 | 14.02 | 14.57 | 15.98 | 9.02           | 9.57  | 10.07 | 10.63 | 12.04 |
|                 | 4H   | 13.65            | 14.15 | 14.71 | 15.21 | 16.63 | 9.56           | 10.06 | 10.62 | 11.12 | 12.54 |
|                 | 6H   | 14.16            | 14.59 | 15.23 | 15.67 | 17.09 | 9.97           | 10.40 | 11.04 | 11.48 | 12.90 |
|                 | 8H   | 14.33            | 14.73 | 15.40 | 15.80 | 17.24 | 10.09          | 10.50 | 11.16 | 11.57 | 13.00 |
|                 | 12H  | 14.42            | 14.78 | 15.51 | 15.87 | 17.31 | 10.15          | 10.52 | 11.24 | 11.60 | 13.04 |
| 8H              | 4H   | 13.61            | 14.02 | 14.68 | 15.08 | 16.52 | 9.83           | 10.24 | 10.90 | 11.31 | 12.74 |
|                 | 6H   | 14.17            | 14.50 | 15.26 | 15.62 | 17.05 | 10.34          | 10.67 | 11.44 | 11.79 | 13.22 |
|                 | 8H   | 14.39            | 14.68 | 15.48 | 15.77 | 17.22 | 10.53          | 10.82 | 11.63 | 11.91 | 13.37 |
|                 | 12H  | 14.52            | 14.77 | 15.62 | 15.86 | 17.36 | 10.64          | 10.90 | 11.74 | 11.99 | 13.48 |
| 12H             | 4H   | 13.56            | 13.93 | 14.65 | 15.01 | 16.45 | 9.84           | 10.20 | 10.92 | 11.28 | 12.72 |
|                 | 6H   | 14.15            | 14.44 | 15.25 | 15.53 | 16.99 | 10.39          | 10.68 | 11.49 | 11.78 | 13.23 |
|                 | 8H   | 14.36            | 14.62 | 15.46 | 15.71 | 17.20 | 10.59          | 10.85 | 11.70 | 11.94 | 13.43 |