

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: P909191

Luminaire Tested: DFN2DIP-SQ3F0-070D070US840-RLLONL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P909191  
REPORT IS A COMBINATION OF REPORTS P901442 AND P898289  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-SQ3F0-070D070US840-RLLONL  
Description: 3 foot, Square Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

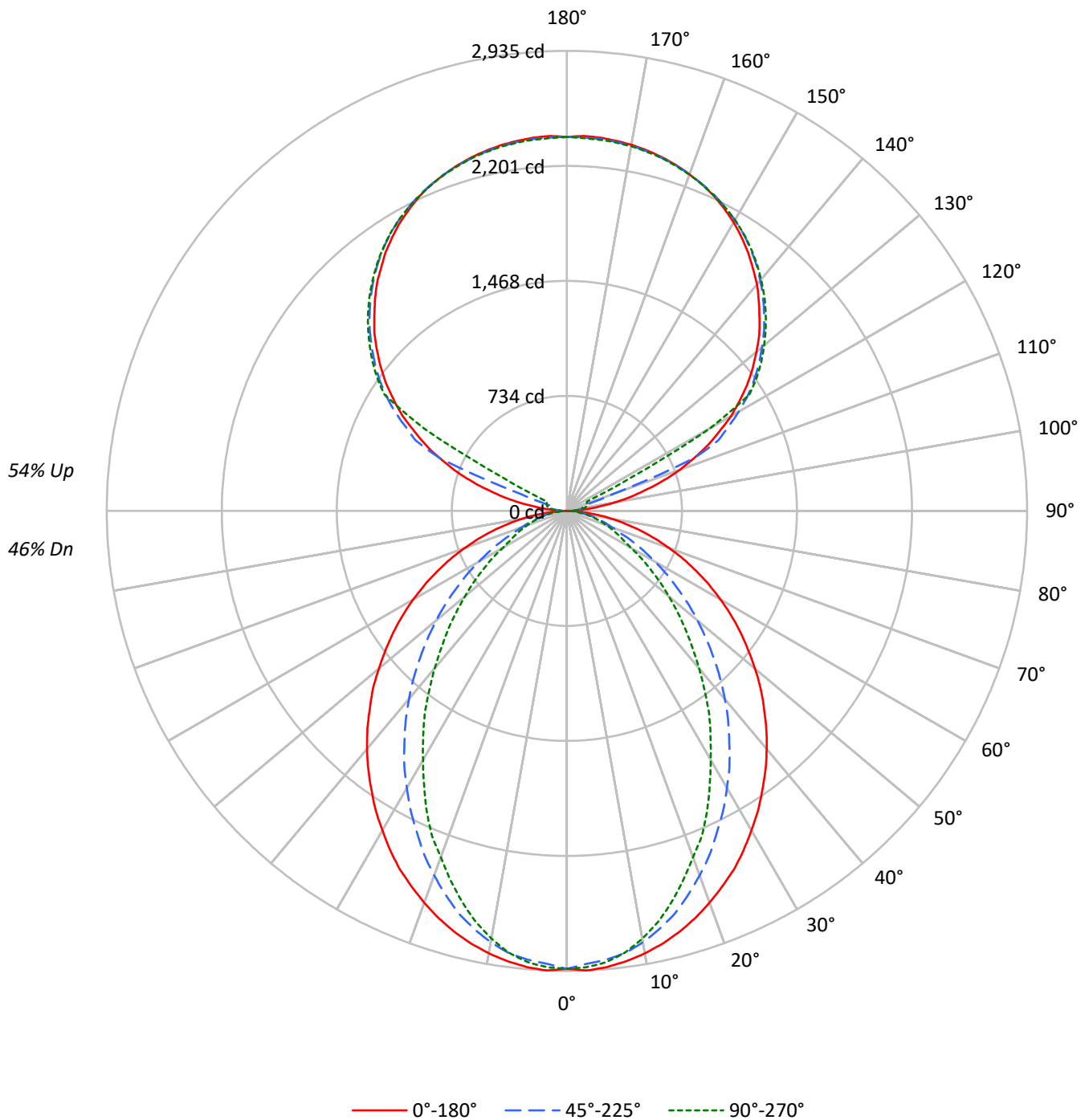
Lumens per Lamp: N/A  
Luminaire Lumens: 13007.0 lumens  
Efficiency: N/A  
Efficacy: 110.1 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 0.99 / 1.16  
Luminous Opening: Rectangular w/ Sides (W: 3.06' x L: 3.06' x H: 0.1')  
CIE Type: General Diffuse

Input Watts (W): 118.1  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9963  
Total Harmonic Distortion (THDi): 0.065  
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   | 106 | 106 | 106 | 106 | 98 | 98 | 98 | 98 | 81 | 81 | 81 | 66 | 66 | 66 | 53 | 53 | 53 |
| 1   | 97  | 93  | 90  | 86  | 89 | 86 | 83 | 80 | 72 | 70 | 68 | 59 | 58 | 56 | 47 | 46 | 45 |
| 2   | 89  | 82  | 76  | 71  | 82 | 76 | 70 | 66 | 63 | 60 | 57 | 52 | 50 | 48 | 42 | 40 | 39 |
| 3   | 81  | 72  | 65  | 60  | 75 | 67 | 61 | 56 | 56 | 52 | 48 | 47 | 43 | 41 | 38 | 35 | 34 |
| 4   | 75  | 64  | 57  | 51  | 68 | 60 | 53 | 48 | 50 | 45 | 41 | 42 | 38 | 35 | 34 | 31 | 29 |
| 5   | 69  | 58  | 50  | 44  | 63 | 53 | 46 | 41 | 45 | 40 | 36 | 38 | 34 | 31 | 31 | 28 | 26 |
| 6   | 63  | 52  | 44  | 38  | 58 | 48 | 41 | 36 | 41 | 36 | 32 | 34 | 30 | 27 | 28 | 25 | 23 |
| 7   | 59  | 47  | 39  | 34  | 54 | 44 | 37 | 32 | 37 | 32 | 28 | 31 | 27 | 24 | 26 | 23 | 21 |
| 8   | 55  | 43  | 35  | 30  | 50 | 40 | 33 | 28 | 34 | 29 | 25 | 29 | 25 | 22 | 24 | 21 | 19 |
| 9   | 51  | 39  | 32  | 27  | 47 | 36 | 30 | 25 | 31 | 26 | 22 | 27 | 23 | 20 | 22 | 19 | 17 |
| 10  | 48  | 36  | 29  | 24  | 44 | 33 | 27 | 23 | 29 | 24 | 20 | 25 | 21 | 18 | 20 | 18 | 15 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 3348 | 3348 | 3348 |
| 5°  | 3351 | 3292 | 3314 |
| 10° | 3316 | 3225 | 3206 |
| 15° | 3268 | 3117 | 3038 |
| 20° | 3205 | 2968 | 2832 |
| 25° | 3141 | 2801 | 2634 |
| 30° | 3056 | 2630 | 2383 |
| 35° | 2972 | 2447 | 2162 |
| 40° | 2887 | 2258 | 1909 |
| 45° | 2788 | 2048 | 1680 |
| 50° | 2686 | 1836 | 1457 |
| 55° | 2579 | 1610 | 1242 |
| 60° | 2455 | 1374 | 1021 |
| 65° | 2311 | 1135 | 918  |
| 70° | 2138 | 912  | 829  |
| 75° | 1920 | 799  | 752  |
| 80° | 1604 | 663  | 648  |
| 85° | 1088 | 432  | 481  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 2788 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 273.8   | 2.1       |
| 10°-20°   | 751.7   | 5.8       |
| 20°-30°   | 1055.3  | 8.1       |
| 30°-40°   | 1150.4  | 8.8       |
| 40°-50°   | 1057.3  | 8.1       |
| 50°-60°   | 830.4   | 6.4       |
| 60°-70°   | 540.5   | 4.2       |
| 70°-80°   | 278.2   | 2.1       |
| 80°-90°   | 75.2    | 0.6       |
| 90°-100°  | 78.7    | 0.6       |
| 100°-110° | 293.3   | 2.3       |
| 110°-120° | 777.8   | 6.0       |
| 120°-130° | 1290.0  | 9.9       |
| 130°-140° | 1370.3  | 10.5      |
| 140°-150° | 1273.5  | 9.8       |
| 150°-160° | 1023.9  | 7.9       |
| 160°-170° | 659.7   | 5.1       |
| 170°-180° | 227.1   | 1.7       |
| 0°-30°    | 2080.9  | 16.0      |
| 0°-40°    | 3231.2  | 24.8      |
| 0°-60°    | 5118.9  | 39.4      |
| 0°-90°    | 6012.8  | 46.2      |
| 90°-120°  | 1149.7  | 8.8       |
| 90°-150°  | 5083.5  | 39.1      |
| 90°-180°  | 6994.0  | 53.8      |
| 0°-180°   | 13007.0 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 2922 | 2922  | 2922 | 2922  | 2922 |      |
| 5°   | 2922 | 2908  | 2874 | 2898  | 2890 | 277  |
| 15°  | 2779 | 2750  | 2660 | 2610  | 2583 | 783  |
| 25°  | 2522 | 2438  | 2263 | 2155  | 2115 | 1160 |
| 35°  | 2173 | 2038  | 1806 | 1639  | 1581 | 1360 |
| 45°  | 1777 | 1600  | 1322 | 1134  | 1071 | 1372 |
| 55°  | 1351 | 1145  | 859  | 701   | 651  | 1207 |
| 65°  | 912  | 698   | 460  | 370   | 362  | 904  |
| 75°  | 486  | 301   | 212  | 193   | 190  | 515  |
| 85°  | 114  | 58    | 50   | 50    | 50   | 130  |
| 90°  | 2    | 21    | 34   | 43    | 47   | 12   |
| 95°  | 112  | 55    | 67   | 76    | 74   | 133  |
| 105° | 525  | 577   | 105  | 124   | 131  | 561  |
| 115° | 993  | 1022  | 1065 | 266   | 142  | 977  |
| 125° | 1403 | 1426  | 1459 | 1471  | 1476 | 1252 |
| 135° | 1737 | 1764  | 1780 | 1797  | 1794 | 1342 |
| 145° | 2015 | 2013  | 2042 | 2054  | 2046 | 1260 |
| 155° | 2218 | 2203  | 2224 | 2234  | 2220 | 1022 |
| 165° | 2337 | 2327  | 2332 | 2344  | 2332 | 660  |
| 175° | 2391 | 2379  | 2382 | 2394  | 2377 | 228  |
| 180° | 2386 | 2386  | 2386 | 2386  | 2386 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 2921.6 | 2921.6 | 2921.6 | 2921.6 | 2921.6 |
| 2.5°   | 2934.8 | 2921.6 | 2892.5 | 2919.1 | 2913.8 |
| 5°     | 2921.6 | 2908.4 | 2874.0 | 2897.8 | 2889.9 |
| 7.5°   | 2897.8 | 2882.1 | 2845.1 | 2855.4 | 2842.3 |
| 10°    | 2866.1 | 2847.6 | 2794.8 | 2786.7 | 2771.0 |
| 12.5°  | 2826.5 | 2802.7 | 2731.2 | 2715.4 | 2686.2 |
| 15°    | 2778.8 | 2749.7 | 2659.9 | 2609.7 | 2583.3 |
| 17.5°  | 2723.3 | 2681.0 | 2569.9 | 2511.7 | 2469.4 |
| 20°    | 2659.9 | 2606.9 | 2474.8 | 2408.8 | 2350.5 |
| 22.5°  | 2591.2 | 2530.3 | 2376.8 | 2287.0 | 2247.6 |
| 25°    | 2522.4 | 2437.7 | 2263.2 | 2155.0 | 2115.2 |
| 27.5°  | 2440.5 | 2350.5 | 2157.5 | 2033.3 | 1972.4 |
| 30°    | 2353.3 | 2252.6 | 2041.0 | 1906.4 | 1834.9 |
| 32.5°  | 2268.6 | 2146.9 | 1930.3 | 1771.5 | 1705.3 |
| 35°    | 2173.4 | 2038.5 | 1806.0 | 1639.4 | 1581.0 |
| 37.5°  | 2080.9 | 1935.3 | 1689.6 | 1506.9 | 1441.1 |
| 40°    | 1983.0 | 1824.5 | 1567.8 | 1380.2 | 1311.4 |
| 42.5°  | 1882.6 | 1713.4 | 1446.3 | 1250.5 | 1184.7 |
| 45°    | 1776.9 | 1599.5 | 1322.1 | 1134.2 | 1070.8 |
| 47.5°  | 1676.4 | 1488.7 | 1203.2 | 1015.2 | 957.2  |
| 50°    | 1565.3 | 1377.7 | 1086.7 | 904.1  | 848.9  |
| 52.5°  | 1456.7 | 1258.4 | 975.6  | 801.1  | 750.9  |
| 55°    | 1351.0 | 1144.8 | 859.2  | 700.7  | 650.6  |
| 57.5°  | 1242.7 | 1031.2 | 756.3  | 608.1  | 565.8  |
| 60°    | 1131.7 | 920.1  | 647.7  | 513.1  | 470.7  |
| 62.5°  | 1023.3 | 811.8  | 555.1  | 428.4  | 407.3  |
| 65°    | 912.2  | 697.9  | 460.1  | 370.3  | 362.1  |
| 67.5°  | 806.5  | 592.2  | 370.3  | 325.1  | 317.3  |
| 70°    | 695.4  | 489.2  | 306.6  | 280.2  | 269.5  |
| 72.5°  | 589.7  | 393.8  | 256.4  | 235.4  | 230.0  |
| 75°    | 486.5  | 301.2  | 211.5  | 193.0  | 190.5  |
| 77.5°  | 383.4  | 214.0  | 166.6  | 155.9  | 150.7  |
| 80°    | 288.1  | 153.4  | 126.8  | 116.4  | 116.4  |
| 82.5°  | 200.9  | 103.2  | 87.3   | 81.9   | 81.9   |
| 85°    | 113.6  | 58.1   | 50.2   | 50.2   | 50.2   |
| 87.5°  | 42.3   | 21.0   | 21.0   | 18.5   | 18.5   |
| 90°    | 1.6    | 20.7   | 34.4   | 43.2   | 46.6   |
| 92.5°  | 43.2   | 36.3   | 41.4   | 44.9   | 46.6   |
| 95°    | 112.1  | 55.1   | 67.3   | 76.0   | 74.2   |
| 97.5°  | 201.9  | 60.5   | 88.0   | 93.3   | 94.9   |
| 100°   | 305.7  | 69.1   | 98.4   | 112.1  | 115.6  |
| 102.5° | 419.4  | 416.2  | 101.9  | 120.8  | 126.0  |
| 105°   | 524.8  | 576.6  | 105.3  | 124.2  | 131.2  |
| 107.5° | 647.3  | 690.4  | 108.9  | 127.7  | 134.7  |
| 110°   | 764.9  | 800.9  | 302.2  | 129.6  | 136.3  |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 875.4  | 906.3  | 877.0  | 132.8  | 138.1  |
| 115°   | 992.6  | 1021.9 | 1065.1 | 265.9  | 141.7  |
| 117.5° | 1094.5 | 1128.9 | 1158.4 | 911.4  | 459.2  |
| 120°   | 1208.4 | 1234.3 | 1265.5 | 1286.2 | 1053.1 |
| 122.5° | 1304.9 | 1332.6 | 1367.4 | 1377.6 | 1379.4 |
| 125°   | 1403.4 | 1425.9 | 1458.8 | 1470.9 | 1475.9 |
| 127.5° | 1493.2 | 1517.3 | 1543.4 | 1560.6 | 1562.3 |
| 130°   | 1577.8 | 1605.5 | 1624.4 | 1643.5 | 1641.8 |
| 132.5° | 1664.2 | 1686.7 | 1705.6 | 1721.1 | 1719.5 |
| 135°   | 1736.7 | 1764.3 | 1779.8 | 1797.2 | 1793.7 |
| 137.5° | 1812.5 | 1833.3 | 1850.7 | 1867.9 | 1862.8 |
| 140°   | 1886.7 | 1900.7 | 1919.6 | 1935.1 | 1926.5 |
| 142.5° | 1949.0 | 1961.2 | 1983.5 | 1997.2 | 1988.6 |
| 145°   | 2014.7 | 2012.9 | 2042.2 | 2054.3 | 2045.7 |
| 147.5° | 2071.4 | 2066.4 | 2095.7 | 2104.3 | 2097.5 |
| 150°   | 2126.8 | 2114.8 | 2142.4 | 2152.6 | 2144.0 |
| 152.5° | 2173.3 | 2159.6 | 2185.5 | 2195.9 | 2183.8 |
| 155°   | 2218.3 | 2202.8 | 2223.5 | 2233.8 | 2220.1 |
| 157.5° | 2254.5 | 2240.8 | 2256.3 | 2268.5 | 2254.5 |
| 160°   | 2285.7 | 2275.2 | 2285.7 | 2295.9 | 2283.8 |
| 162.5° | 2313.2 | 2302.9 | 2311.5 | 2323.6 | 2308.0 |
| 165°   | 2337.3 | 2327.1 | 2332.2 | 2344.3 | 2332.2 |
| 167.5° | 2356.4 | 2345.9 | 2351.3 | 2363.4 | 2347.8 |
| 170°   | 2372.0 | 2361.6 | 2365.0 | 2377.1 | 2361.6 |
| 172.5° | 2382.3 | 2372.0 | 2375.5 | 2387.5 | 2372.0 |
| 175°   | 2390.9 | 2378.7 | 2382.3 | 2394.3 | 2377.1 |
| 177.5° | 2394.3 | 2382.3 | 2384.1 | 2396.2 | 2380.6 |
| 180°   | 2385.7 | 2385.7 | 2385.7 | 2385.7 | 2385.7 |

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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 | 10.95            | 11.75 | 11.94 | 12.75 | 14.08 | 6.91           | 7.71  | 7.90  | 8.71  | 10.04 |
|                 | 3H   | 12.62            | 13.33 | 13.62 | 14.35 | 15.69 | 8.09           | 8.80  | 9.09  | 9.81  | 11.16 |
|                 | 4H   | 13.22            | 13.90 | 14.24 | 14.91 | 16.27 | 8.53           | 9.21  | 9.55  | 10.22 | 11.58 |
|                 | 6H   | 13.64            | 14.26 | 14.67 | 15.28 | 16.65 | 8.85           | 9.47  | 9.88  | 10.49 | 11.86 |
|                 | 8H   | 13.76            | 14.35 | 14.80 | 15.39 | 16.75 | 8.93           | 9.53  | 9.97  | 10.56 | 11.92 |
|                 | 12H  | 13.82            | 14.38 | 14.86 | 15.41 | 16.80 | 8.97           | 9.54  | 10.01 | 10.56 | 11.95 |
| 4H              | 2H   | 10.96            | 11.64 | 11.99 | 12.65 | 14.01 | 7.50           | 8.17  | 8.52  | 9.19  | 10.54 |
|                 | 3H   | 12.78            | 13.34 | 13.82 | 14.39 | 15.76 | 8.84           | 9.40  | 9.87  | 10.44 | 11.81 |
|                 | 4H   | 13.47            | 13.98 | 14.51 | 15.02 | 16.41 | 9.38           | 9.89  | 10.42 | 10.93 | 12.32 |
|                 | 6H   | 13.98            | 14.42 | 15.03 | 15.48 | 16.87 | 9.79           | 10.23 | 10.84 | 11.29 | 12.68 |
|                 | 8H   | 14.15            | 14.56 | 15.20 | 15.61 | 17.02 | 9.91           | 10.33 | 10.97 | 11.38 | 12.78 |
|                 | 12H  | 14.24            | 14.61 | 15.31 | 15.68 | 17.09 | 9.97           | 10.35 | 11.04 | 11.41 | 12.82 |
| 8H              | 4H   | 13.43            | 13.85 | 14.48 | 14.90 | 16.30 | 9.65           | 10.07 | 10.71 | 11.12 | 12.52 |
|                 | 6H   | 13.99            | 14.33 | 15.07 | 15.43 | 16.83 | 10.16          | 10.50 | 11.24 | 11.60 | 13.00 |
|                 | 8H   | 14.21            | 14.50 | 15.29 | 15.58 | 17.00 | 10.35          | 10.65 | 11.43 | 11.72 | 13.14 |
|                 | 12H  | 14.34            | 14.60 | 15.42 | 15.67 | 17.13 | 10.46          | 10.72 | 11.55 | 11.80 | 13.26 |
| 12H             | 4H   | 13.38            | 13.76 | 14.45 | 14.82 | 16.23 | 9.66           | 10.03 | 10.73 | 11.09 | 12.50 |
|                 | 6H   | 13.97            | 14.27 | 15.05 | 15.34 | 16.76 | 10.21          | 10.51 | 11.29 | 11.59 | 13.01 |
|                 | 8H   | 14.18            | 14.45 | 15.27 | 15.52 | 16.98 | 10.41          | 10.68 | 11.50 | 11.75 | 13.21 |