

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: P915009

Luminaire Tested: DFN2DIP-SQ4F0-100D100US927-FLLONL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P915009  
REPORT IS A COMBINATION OF REPORTS P901659 AND P898471  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-SQ4F0-100D100US927-FLLONL  
Description: 4 foot, Square Define Geo, with Direct Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

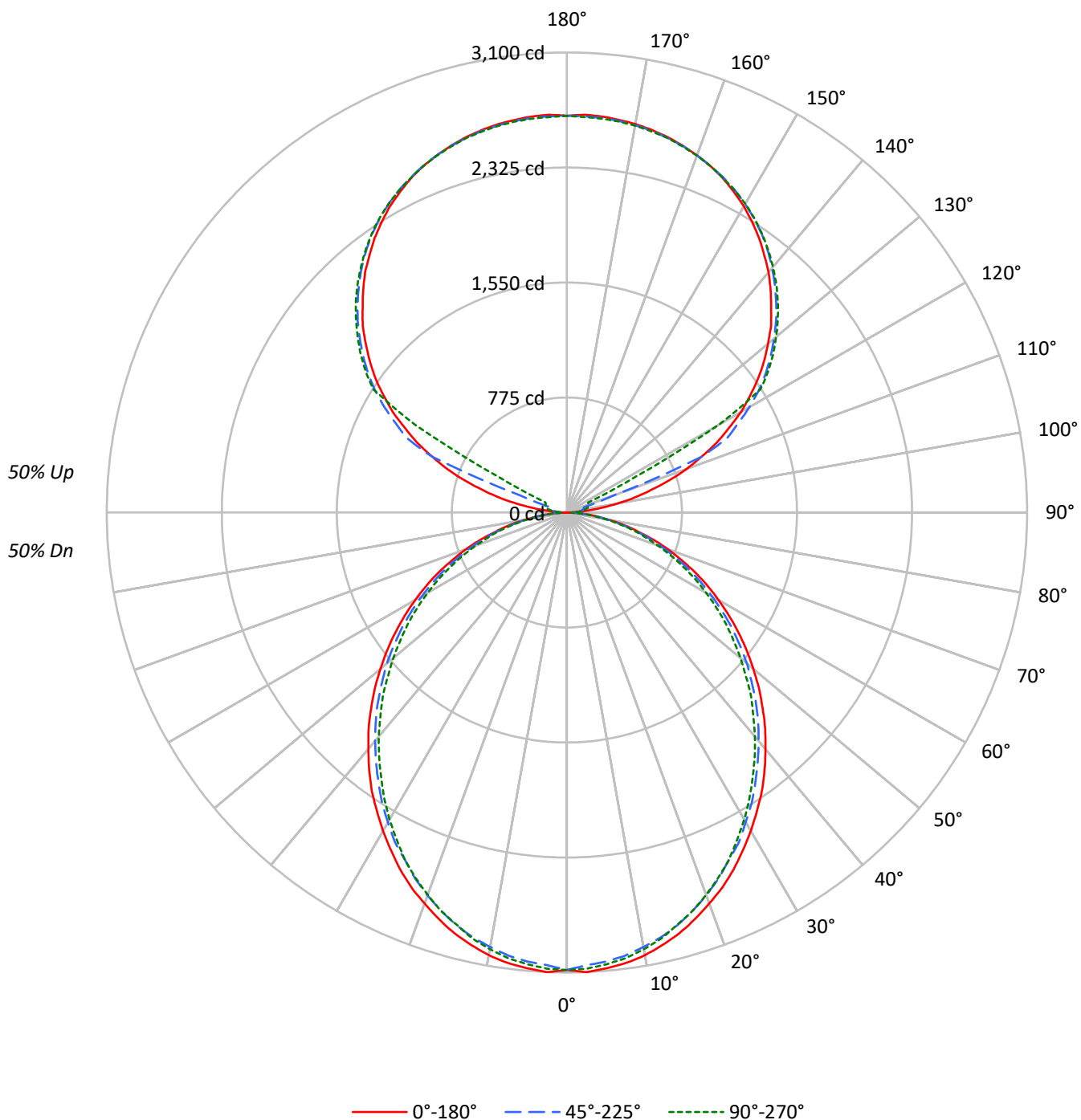
Lumens per Lamp: N/A  
Luminaire Lumens: 15685.2 lumens  
Efficiency: N/A  
Efficacy: 93.7 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 3.92' x L: 3.92' x H: 0.1')  
CIE Type: General Diffuse

Input Watts (W): 167.4  
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   | 107 | 107 | 107 | 107 | 99 | 99 | 99 | 99 | 83 | 83 | 83 | 69 | 69 | 69 | 56 | 56 | 56 |
| 1   | 98  | 93  | 90  | 86  | 90 | 86 | 83 | 80 | 73 | 71 | 68 | 61 | 59 | 58 | 50 | 48 | 47 |
| 2   | 89  | 82  | 75  | 70  | 82 | 76 | 70 | 66 | 64 | 60 | 57 | 53 | 51 | 48 | 44 | 42 | 40 |
| 3   | 81  | 72  | 64  | 59  | 75 | 66 | 60 | 55 | 56 | 52 | 48 | 47 | 44 | 41 | 39 | 36 | 34 |
| 4   | 74  | 64  | 56  | 50  | 68 | 59 | 52 | 47 | 50 | 45 | 41 | 42 | 38 | 35 | 35 | 32 | 29 |
| 5   | 68  | 57  | 48  | 42  | 63 | 53 | 45 | 40 | 45 | 39 | 35 | 38 | 34 | 30 | 31 | 28 | 26 |
| 6   | 63  | 51  | 43  | 37  | 58 | 47 | 40 | 35 | 40 | 35 | 31 | 34 | 30 | 27 | 28 | 25 | 23 |
| 7   | 58  | 46  | 38  | 32  | 53 | 43 | 36 | 30 | 37 | 31 | 27 | 31 | 27 | 23 | 26 | 23 | 20 |
| 8   | 54  | 42  | 34  | 29  | 50 | 39 | 32 | 27 | 33 | 28 | 24 | 28 | 24 | 21 | 24 | 20 | 18 |
| 9   | 50  | 38  | 30  | 25  | 46 | 35 | 29 | 24 | 31 | 25 | 21 | 26 | 22 | 19 | 22 | 19 | 16 |
| 10  | 47  | 35  | 28  | 23  | 43 | 33 | 26 | 22 | 28 | 23 | 19 | 24 | 20 | 17 | 20 | 17 | 15 |

**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: 0°

Vertical Angle: 45°

Luminance: 1804 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 290.1   | 1.8       |
| 10°-20°   | 816.3   | 5.2       |
| 20°-30°   | 1199.6  | 7.6       |
| 30°-40°   | 1393.3  | 8.9       |
| 40°-50°   | 1391.5  | 8.9       |
| 50°-60°   | 1213.4  | 7.7       |
| 60°-70°   | 897.0   | 5.7       |
| 70°-80°   | 507.5   | 3.2       |
| 80°-90°   | 138.7   | 0.9       |
| 90°-100°  | 88.1    | 0.6       |
| 100°-110° | 328.6   | 2.1       |
| 110°-120° | 871.6   | 5.6       |
| 120°-130° | 1445.6  | 9.2       |
| 130°-140° | 1535.6  | 9.8       |
| 140°-150° | 1427.1  | 9.1       |
| 150°-160° | 1147.4  | 7.3       |
| 160°-170° | 739.3   | 4.7       |
| 170°-180° | 254.5   | 1.6       |
| 0°-30°    | 2306.0  | 14.7      |
| 0°-40°    | 3699.3  | 23.6      |
| 0°-60°    | 6304.2  | 40.2      |
| 0°-90°    | 7847.3  | 50.0      |
| 90°-120°  | 1288.4  | 8.2       |
| 90°-150°  | 5696.7  | 36.3      |
| 90°-180°  | 7838.0  | 50.0      |
| 0°-180°   | 15685.2 | 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    | 23    | 39   | 48    | 52   | 14   |
| 95°  | 126  | 62    | 75   | 85    | 83   | 149  |
| 105° | 588  | 646   | 118  | 139   | 147  | 628  |
| 115° | 1112 | 1145  | 1194 | 298   | 159  | 1095 |
| 125° | 1573 | 1598  | 1635 | 1648  | 1654 | 1403 |
| 135° | 1946 | 1977  | 1994 | 2014  | 2010 | 1503 |
| 145° | 2258 | 2256  | 2288 | 2302  | 2292 | 1412 |
| 155° | 2486 | 2469  | 2492 | 2503  | 2488 | 1146 |
| 165° | 2619 | 2608  | 2614 | 2627  | 2614 | 740  |
| 175° | 2679 | 2666  | 2670 | 2683  | 2664 | 255  |
| 180° | 2674 | 2674  | 2674 | 2674  | 2674 |      |

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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°    | 1.8    | 23.2   | 38.6   | 48.5   | 52.1   |
| 92.5°  | 48.5   | 40.6   | 46.4   | 50.3   | 52.1   |
| 95°    | 125.6  | 61.8   | 75.3   | 85.2   | 83.2   |
| 97.5°  | 226.2  | 67.7   | 98.5   | 104.5  | 106.4  |
| 100°   | 342.5  | 77.4   | 110.3  | 125.6  | 129.6  |
| 102.5° | 470.0  | 466.4  | 114.2  | 135.3  | 141.2  |
| 105°   | 588.1  | 646.2  | 118.1  | 139.2  | 147.0  |
| 107.5° | 725.5  | 773.7  | 122.0  | 143.1  | 150.9  |
| 110°   | 857.1  | 897.5  | 338.6  | 145.2  | 152.7  |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 980.9  | 1015.6 | 982.8  | 148.9  | 154.9  |
| 115°   | 1112.3 | 1145.2 | 1193.7 | 297.9  | 158.8  |
| 117.5° | 1226.5 | 1265.1 | 1298.1 | 1021.4 | 514.6  |
| 120°   | 1354.2 | 1383.1 | 1418.1 | 1441.3 | 1180.1 |
| 122.5° | 1462.4 | 1493.4 | 1532.2 | 1543.7 | 1545.8 |
| 125°   | 1572.7 | 1598.0 | 1634.7 | 1648.3 | 1654.0 |
| 127.5° | 1673.3 | 1700.4 | 1729.6 | 1748.9 | 1750.7 |
| 130°   | 1768.1 | 1799.2 | 1820.4 | 1841.7 | 1839.8 |
| 132.5° | 1864.9 | 1890.1 | 1911.3 | 1928.7 | 1926.9 |
| 135°   | 1946.2 | 1977.2 | 1994.5 | 2014.0 | 2010.1 |
| 137.5° | 2031.2 | 2054.4 | 2073.9 | 2093.3 | 2087.5 |
| 140°   | 2114.3 | 2130.0 | 2151.1 | 2168.6 | 2158.9 |
| 142.5° | 2184.2 | 2197.7 | 2222.8 | 2238.1 | 2228.6 |
| 145°   | 2257.7 | 2255.7 | 2288.5 | 2302.1 | 2292.4 |
| 147.5° | 2321.3 | 2315.6 | 2348.4 | 2358.1 | 2350.6 |
| 150°   | 2383.4 | 2369.8 | 2400.9 | 2412.4 | 2402.7 |
| 152.5° | 2435.5 | 2420.1 | 2449.1 | 2460.8 | 2447.2 |
| 155°   | 2485.9 | 2468.6 | 2491.8 | 2503.3 | 2487.9 |
| 157.5° | 2526.5 | 2511.1 | 2528.6 | 2542.1 | 2526.5 |
| 160°   | 2561.4 | 2549.7 | 2561.4 | 2572.9 | 2559.4 |
| 162.5° | 2592.2 | 2580.7 | 2590.4 | 2603.9 | 2586.5 |
| 165°   | 2619.3 | 2607.8 | 2613.6 | 2627.1 | 2613.6 |
| 167.5° | 2640.7 | 2628.9 | 2635.0 | 2648.5 | 2631.0 |
| 170°   | 2658.1 | 2646.4 | 2650.3 | 2663.9 | 2646.4 |
| 172.5° | 2669.6 | 2658.1 | 2662.0 | 2675.6 | 2658.1 |
| 175°   | 2679.2 | 2665.7 | 2669.6 | 2683.2 | 2663.9 |
| 177.5° | 2683.2 | 2669.6 | 2671.7 | 2685.3 | 2667.7 |
| 180°   | 2673.5 | 2673.5 | 2673.5 | 2673.5 | 2673.5 |

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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 | 9.97             | 10.83 | 10.92 | 11.80 | 13.07 | 9.52           | 10.38 | 10.48 | 11.36 | 12.63 |
|                 | 3H   | 11.63            | 12.41 | 12.60 | 13.39 | 14.68 | 11.14          | 11.91 | 12.11 | 12.90 | 14.19 |
|                 | 4H   | 12.22            | 12.95 | 13.20 | 13.94 | 15.24 | 11.73          | 12.46 | 12.71 | 13.45 | 14.75 |
|                 | 6H   | 12.63            | 13.30 | 13.62 | 14.29 | 15.61 | 12.13          | 12.80 | 13.12 | 13.79 | 15.10 |
|                 | 8H   | 12.73            | 13.37 | 13.73 | 14.38 | 15.69 | 12.23          | 12.87 | 13.23 | 13.88 | 15.19 |
|                 | 12H  | 12.78            | 13.39 | 13.79 | 14.39 | 15.73 | 12.27          | 12.88 | 13.28 | 13.88 | 15.22 |
| 4H              | 2H   | 10.43            | 11.16 | 11.42 | 12.15 | 13.45 | 10.07          | 10.81 | 11.06 | 11.79 | 13.09 |
|                 | 3H   | 12.30            | 12.91 | 13.30 | 13.92 | 15.24 | 11.89          | 12.50 | 12.89 | 13.52 | 14.83 |
|                 | 4H   | 13.02            | 13.58 | 14.02 | 14.58 | 15.92 | 12.59          | 13.15 | 13.60 | 14.16 | 15.50 |
|                 | 6H   | 13.54            | 14.02 | 14.55 | 15.05 | 16.38 | 13.10          | 13.59 | 14.12 | 14.62 | 15.95 |
|                 | 8H   | 13.69            | 14.14 | 14.71 | 15.16 | 16.51 | 13.25          | 13.70 | 14.27 | 14.72 | 16.08 |
|                 | 12H  | 13.76            | 14.17 | 14.80 | 15.21 | 16.57 | 13.31          | 13.72 | 14.35 | 14.76 | 16.12 |
| 8H              | 4H   | 13.21            | 13.66 | 14.23 | 14.69 | 16.04 | 12.84          | 13.29 | 13.86 | 14.31 | 15.66 |
|                 | 6H   | 13.85            | 14.22 | 14.89 | 15.29 | 16.64 | 13.47          | 13.84 | 14.51 | 14.90 | 16.25 |
|                 | 8H   | 14.07            | 14.40 | 15.12 | 15.45 | 16.82 | 13.68          | 14.01 | 14.73 | 15.06 | 16.43 |
|                 | 12H  | 14.21            | 14.50 | 15.26 | 15.54 | 16.95 | 13.80          | 14.09 | 14.85 | 15.13 | 16.54 |
| 12H             | 4H   | 13.20            | 13.61 | 14.24 | 14.65 | 16.00 | 12.83          | 13.24 | 13.87 | 14.28 | 15.63 |
|                 | 6H   | 13.88            | 14.21 | 14.93 | 15.26 | 16.63 | 13.51          | 13.84 | 14.56 | 14.89 | 16.26 |
|                 | 8H   | 14.13            | 14.41 | 15.18 | 15.46 | 16.87 | 13.75          | 14.03 | 14.80 | 15.08 | 16.49 |