

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: P912197

Luminaire Tested: DFN2DIP-SQ4F0-080D070US850-FLLONL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P912197  
REPORT IS A COMBINATION OF REPORTS P901601 AND P898471  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-SQ4F0-080D070US850-FLLONL  
Description: 4 foot, Square Define Geo, with Direct Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

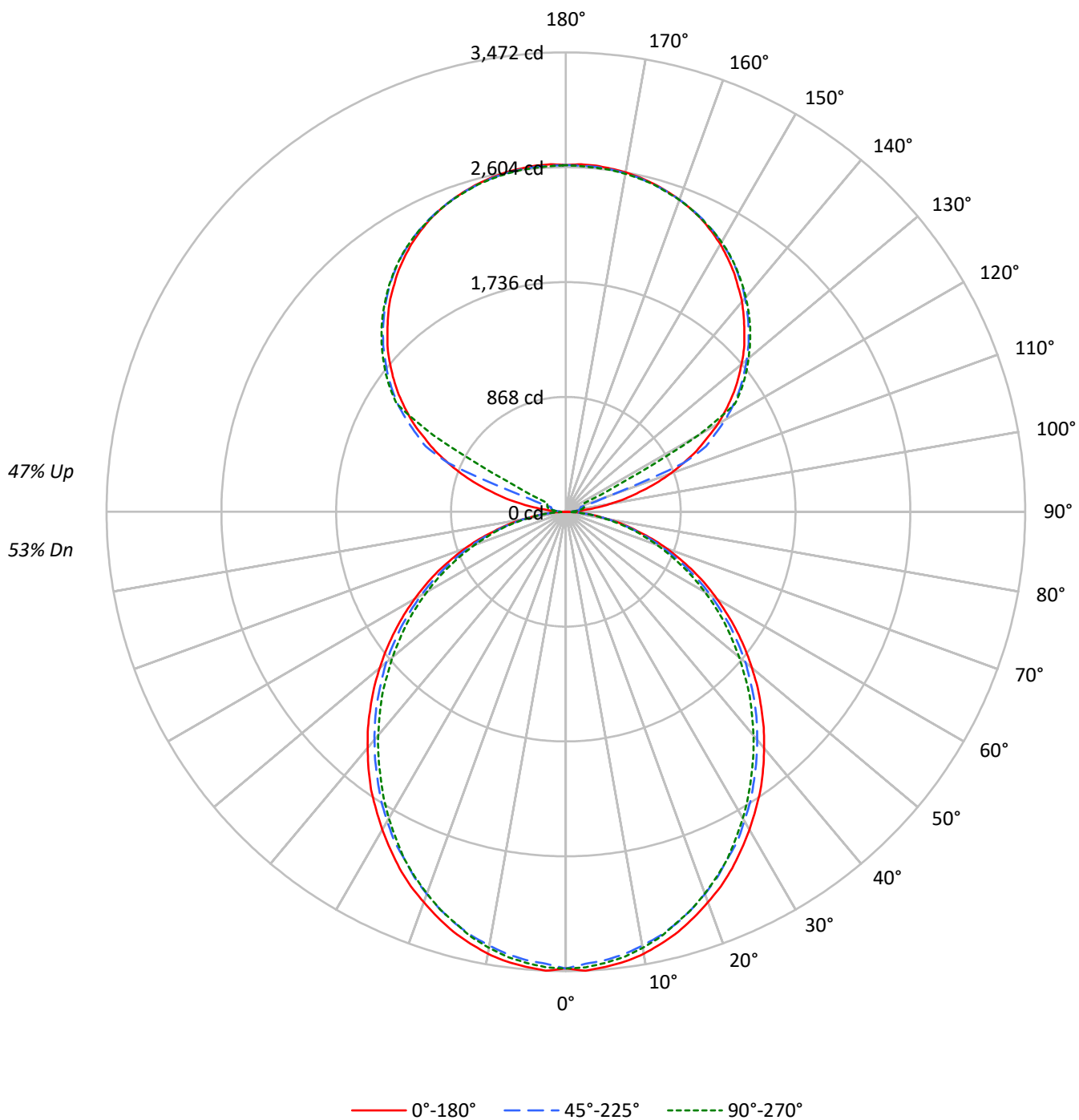
Lumens per Lamp: N/A  
Luminaire Lumens: 16468.7 lumens  
Efficiency: N/A  
Efficacy: 133.2 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 3.92' x L: 3.92' x H: 0.1')  
CIE Type: General Diffuse

Input Watts (W): 123.6  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9954  
Total Harmonic Distortion (THDi): 0.076  
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   | 108 | 108 | 108 | 108 | 100 | 100 | 100 | 100 | 85 | 85 | 85 | 72 | 72 | 72 | 59 | 59 | 59 |
| 1   | 99  | 94  | 90  | 87  | 91  | 87  | 84  | 81  | 75 | 72 | 70 | 63 | 61 | 60 | 52 | 51 | 50 |
| 2   | 90  | 82  | 76  | 71  | 83  | 76  | 71  | 66  | 65 | 61 | 58 | 55 | 52 | 50 | 46 | 44 | 42 |
| 3   | 82  | 72  | 65  | 59  | 76  | 67  | 61  | 56  | 58 | 53 | 49 | 49 | 45 | 42 | 41 | 38 | 36 |
| 4   | 75  | 64  | 56  | 50  | 69  | 60  | 53  | 47  | 51 | 46 | 42 | 44 | 40 | 36 | 37 | 33 | 31 |
| 5   | 69  | 57  | 49  | 43  | 63  | 53  | 46  | 41  | 46 | 40 | 36 | 39 | 35 | 31 | 33 | 30 | 27 |
| 6   | 63  | 51  | 43  | 37  | 59  | 48  | 41  | 35  | 41 | 36 | 31 | 35 | 31 | 28 | 30 | 26 | 24 |
| 7   | 59  | 46  | 38  | 33  | 54  | 43  | 36  | 31  | 38 | 32 | 28 | 32 | 28 | 24 | 27 | 24 | 21 |
| 8   | 54  | 42  | 34  | 29  | 50  | 39  | 32  | 27  | 34 | 29 | 25 | 30 | 25 | 22 | 25 | 22 | 19 |
| 9   | 51  | 38  | 31  | 26  | 47  | 36  | 29  | 25  | 31 | 26 | 22 | 27 | 23 | 20 | 23 | 20 | 17 |
| 10  | 47  | 35  | 28  | 23  | 44  | 33  | 26  | 22  | 29 | 24 | 20 | 25 | 21 | 18 | 21 | 18 | 16 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 2422 | 2422 | 2422 |
| 5°  | 2426 | 2389 | 2405 |
| 10° | 2406 | 2357 | 2373 |
| 15° | 2371 | 2319 | 2323 |
| 20° | 2323 | 2266 | 2272 |
| 25° | 2276 | 2202 | 2212 |
| 30° | 2216 | 2142 | 2136 |
| 35° | 2159 | 2072 | 2056 |
| 40° | 2090 | 2001 | 1980 |
| 45° | 2020 | 1930 | 1902 |
| 50° | 1945 | 1855 | 1811 |
| 55° | 1865 | 1769 | 1728 |
| 60° | 1775 | 1666 | 1633 |
| 65° | 1678 | 1560 | 1521 |
| 70° | 1553 | 1431 | 1400 |
| 75° | 1380 | 1277 | 1290 |
| 80° | 1172 | 1080 | 1078 |
| 85° | 848  | 739  | 724  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°  
Vertical Angle: 45°  
Luminance: 2020 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 324.9   | 2.0       |
| 10°-20°   | 914.2   | 5.6       |
| 20°-30°   | 1343.5  | 8.2       |
| 30°-40°   | 1560.4  | 9.5       |
| 40°-50°   | 1558.4  | 9.5       |
| 50°-60°   | 1358.9  | 8.3       |
| 60°-70°   | 1004.5  | 6.1       |
| 70°-80°   | 568.4   | 3.5       |
| 80°-90°   | 154.6   | 0.9       |
| 90°-100°  | 86.4    | 0.5       |
| 100°-110° | 322.1   | 2.0       |
| 110°-120° | 854.1   | 5.2       |
| 120°-130° | 1416.6  | 8.6       |
| 130°-140° | 1504.8  | 9.1       |
| 140°-150° | 1398.5  | 8.5       |
| 150°-160° | 1124.4  | 6.8       |
| 160°-170° | 724.5   | 4.4       |
| 170°-180° | 249.4   | 1.5       |
| 0°-30°    | 2582.6  | 15.7      |
| 0°-40°    | 4143.0  | 25.2      |
| 0°-60°    | 7060.4  | 42.9      |
| 0°-90°    | 8787.9  | 53.4      |
| 90°-120°  | 1262.6  | 7.7       |
| 90°-150°  | 5582.5  | 33.9      |
| 90°-180°  | 7681.0  | 46.6      |
| 0°-180°   | 16468.7 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 3452 | 3452  | 3452 | 3452  | 3452 |      |
| 5°   | 3452 | 3439  | 3402 | 3429  | 3423 | 328  |
| 15°  | 3286 | 3267  | 3223 | 3237  | 3220 | 926  |
| 25°  | 2974 | 2948  | 2892 | 2898  | 2892 | 1369 |
| 35°  | 2566 | 2533  | 2480 | 2460  | 2443 | 1602 |
| 45°  | 2088 | 2065  | 2015 | 1979  | 1965 | 1612 |
| 55°  | 1580 | 1560  | 1520 | 1481  | 1464 | 1413 |
| 65°  | 1066 | 1046  | 1012 | 983   | 966  | 1054 |
| 75°  | 558  | 551   | 534  | 515   | 521  | 595  |
| 85°  | 136  | 133   | 130  | 119   | 116  | 152  |
| 90°  | 2    | 23    | 38   | 48    | 51   | 15   |
| 95°  | 123  | 61    | 74   | 84    | 82   | 146  |
| 105° | 576  | 633   | 116  | 136   | 144  | 616  |
| 115° | 1090 | 1122  | 1170 | 292   | 156  | 1073 |
| 125° | 1541 | 1566  | 1602 | 1615  | 1621 | 1375 |
| 135° | 1907 | 1938  | 1954 | 1974  | 1970 | 1473 |
| 145° | 2212 | 2210  | 2243 | 2256  | 2246 | 1384 |
| 155° | 2436 | 2419  | 2442 | 2453  | 2438 | 1123 |
| 165° | 2567 | 2556  | 2561 | 2574  | 2561 | 725  |
| 175° | 2626 | 2612  | 2616 | 2629  | 2610 | 250  |
| 180° | 2620 | 2620  | 2620 | 2620  | 2620 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 3452.1 | 3452.1 | 3452.1 | 3452.1 | 3452.1 |
| 2.5°   | 3472.2 | 3455.6 | 3419.0 | 3452.1 | 3445.8 |
| 5°     | 3452.1 | 3439.1 | 3402.5 | 3428.9 | 3422.6 |
| 7.5°   | 3428.9 | 3409.2 | 3372.6 | 3399.3 | 3392.7 |
| 10°    | 3392.7 | 3369.4 | 3329.6 | 3355.9 | 3346.2 |
| 12.5°  | 3342.6 | 3322.9 | 3283.1 | 3299.6 | 3293.0 |
| 15°    | 3286.3 | 3266.6 | 3223.2 | 3236.6 | 3220.1 |
| 17.5°  | 3216.5 | 3196.8 | 3153.4 | 3170.1 | 3153.4 |
| 20°    | 3140.1 | 3120.4 | 3073.9 | 3083.8 | 3070.7 |
| 22.5°  | 3064.1 | 3034.1 | 2990.8 | 2990.8 | 2984.1 |
| 25°    | 2974.2 | 2947.8 | 2891.5 | 2897.8 | 2891.5 |
| 27.5°  | 2874.5 | 2851.3 | 2808.3 | 2798.5 | 2781.9 |
| 30°    | 2775.3 | 2748.4 | 2698.9 | 2689.0 | 2675.6 |
| 32.5°  | 2668.9 | 2649.2 | 2595.9 | 2575.9 | 2562.6 |
| 35°    | 2566.0 | 2533.0 | 2479.7 | 2459.7 | 2443.1 |
| 37.5°  | 2449.8 | 2419.8 | 2366.7 | 2343.4 | 2326.9 |
| 40°    | 2330.5 | 2303.6 | 2250.5 | 2220.9 | 2207.5 |
| 42.5°  | 2214.2 | 2187.4 | 2134.6 | 2101.1 | 2081.5 |
| 45°    | 2088.1 | 2064.8 | 2014.8 | 1978.6 | 1965.3 |
| 47.5°  | 1965.3 | 1942.0 | 1888.7 | 1852.1 | 1832.4 |
| 50°    | 1835.6 | 1819.1 | 1772.5 | 1726.0 | 1709.5 |
| 52.5°  | 1709.5 | 1686.2 | 1643.3 | 1606.7 | 1583.4 |
| 55°    | 1580.2 | 1560.1 | 1520.4 | 1480.6 | 1464.0 |
| 57.5°  | 1450.7 | 1434.2 | 1390.8 | 1351.0 | 1337.6 |
| 60°    | 1321.0 | 1308.1 | 1261.5 | 1224.9 | 1215.0 |
| 62.5°  | 1194.9 | 1171.8 | 1138.6 | 1105.6 | 1092.1 |
| 65°    | 1065.7 | 1045.7 | 1012.5 | 982.6  | 966.0  |
| 67.5°  | 932.9  | 916.0  | 886.4  | 863.2  | 849.8  |
| 70°    | 810.0  | 796.6  | 766.8  | 743.5  | 730.4  |
| 72.5°  | 683.9  | 670.6  | 654.0  | 630.8  | 620.9  |
| 75°    | 557.5  | 551.2  | 534.3  | 514.6  | 521.2  |
| 77.5°  | 444.8  | 431.4  | 424.7  | 414.9  | 405.0  |
| 80°    | 332.1  | 328.6  | 321.9  | 312.1  | 305.3  |
| 82.5°  | 225.8  | 225.8  | 222.6  | 209.2  | 209.2  |
| 85°    | 136.0  | 132.7  | 129.6  | 119.4  | 116.2  |
| 87.5°  | 59.9   | 53.2   | 46.5   | 36.6   | 33.2   |
| 90°    | 1.8    | 22.7   | 37.8   | 47.5   | 51.1   |
| 92.5°  | 47.5   | 39.8   | 45.5   | 49.4   | 51.1   |
| 95°    | 123.1  | 60.6   | 73.9   | 83.5   | 81.5   |
| 97.5°  | 221.7  | 66.4   | 96.6   | 102.5  | 104.2  |
| 100°   | 335.7  | 75.9   | 108.0  | 123.1  | 127.0  |
| 102.5° | 460.6  | 457.0  | 111.9  | 132.6  | 138.4  |
| 105°   | 576.3  | 633.2  | 115.7  | 136.4  | 144.1  |
| 107.5° | 710.9  | 758.2  | 119.6  | 140.3  | 147.9  |
| 110°   | 840.0  | 879.5  | 331.8  | 142.3  | 149.7  |



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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 961.3  | 995.2  | 963.1  | 145.8  | 151.7  |
| 115°   | 1090.0 | 1122.2 | 1169.7 | 292.0  | 155.6  |
| 117.5° | 1201.9 | 1239.8 | 1272.1 | 1000.9 | 504.3  |
| 120°   | 1327.0 | 1355.4 | 1389.7 | 1412.4 | 1156.5 |
| 122.5° | 1433.0 | 1463.4 | 1501.6 | 1512.8 | 1514.8 |
| 125°   | 1541.2 | 1565.9 | 1602.0 | 1615.3 | 1620.8 |
| 127.5° | 1639.8 | 1666.3 | 1694.9 | 1713.8 | 1715.6 |
| 130°   | 1732.7 | 1763.1 | 1783.8 | 1804.8 | 1803.0 |
| 132.5° | 1827.5 | 1852.3 | 1873.0 | 1890.1 | 1888.3 |
| 135°   | 1907.1 | 1937.5 | 1954.5 | 1973.6 | 1969.8 |
| 137.5° | 1990.4 | 2013.3 | 2032.4 | 2051.3 | 2045.7 |
| 140°   | 2071.9 | 2087.2 | 2108.0 | 2125.1 | 2115.6 |
| 142.5° | 2140.4 | 2153.7 | 2178.2 | 2193.3 | 2183.8 |
| 145°   | 2212.5 | 2210.5 | 2242.6 | 2255.9 | 2246.5 |
| 147.5° | 2274.8 | 2269.2 | 2301.4 | 2310.8 | 2303.4 |
| 150°   | 2335.6 | 2322.4 | 2352.7 | 2363.9 | 2354.5 |
| 152.5° | 2386.7 | 2371.6 | 2400.0 | 2411.4 | 2398.2 |
| 155°   | 2436.0 | 2419.1 | 2441.8 | 2453.1 | 2438.0 |
| 157.5° | 2475.8 | 2460.8 | 2477.8 | 2491.1 | 2475.8 |
| 160°   | 2510.1 | 2498.6 | 2510.1 | 2521.3 | 2508.0 |
| 162.5° | 2540.3 | 2529.0 | 2538.4 | 2551.7 | 2534.6 |
| 165°   | 2566.8 | 2555.6 | 2561.1 | 2574.4 | 2561.1 |
| 167.5° | 2587.7 | 2576.2 | 2582.1 | 2595.4 | 2578.3 |
| 170°   | 2604.8 | 2593.4 | 2597.2 | 2610.5 | 2593.4 |
| 172.5° | 2616.1 | 2604.8 | 2608.7 | 2621.9 | 2604.8 |
| 175°   | 2625.6 | 2612.2 | 2616.1 | 2629.3 | 2610.5 |
| 177.5° | 2629.3 | 2616.1 | 2618.1 | 2631.4 | 2614.2 |
| 180°   | 2619.9 | 2619.9 | 2619.9 | 2619.9 | 2619.9 |

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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 | 10.66            | 11.56 | 11.59 | 12.50 | 13.72 | 10.22          | 11.11 | 11.15 | 12.06 | 13.28 |
|                 | 3H   | 12.33            | 13.13 | 13.27 | 14.09 | 15.33 | 11.84          | 12.64 | 12.78 | 13.60 | 14.84 |
|                 | 4H   | 12.92            | 13.68 | 13.88 | 14.64 | 15.89 | 12.43          | 13.19 | 13.38 | 14.15 | 15.40 |
|                 | 6H   | 13.33            | 14.03 | 14.29 | 14.99 | 16.26 | 12.83          | 13.53 | 13.79 | 14.49 | 15.76 |
|                 | 8H   | 13.44            | 14.10 | 14.41 | 15.08 | 16.35 | 12.93          | 13.60 | 13.90 | 14.58 | 15.85 |
|                 | 12H  | 13.49            | 14.12 | 14.46 | 15.09 | 16.39 | 12.98          | 13.61 | 13.95 | 14.58 | 15.88 |
| 4H              | 2H   | 11.13            | 11.89 | 12.09 | 12.85 | 14.10 | 10.77          | 11.53 | 11.73 | 12.49 | 13.75 |
|                 | 3H   | 13.00            | 13.63 | 13.97 | 14.62 | 15.89 | 12.59          | 13.23 | 13.56 | 14.22 | 15.49 |
|                 | 4H   | 13.72            | 14.30 | 14.70 | 15.28 | 16.58 | 13.30          | 13.88 | 14.28 | 14.86 | 16.15 |
|                 | 6H   | 14.24            | 14.74 | 15.23 | 15.75 | 17.04 | 13.81          | 14.31 | 14.80 | 15.31 | 16.61 |
|                 | 8H   | 14.40            | 14.86 | 15.39 | 15.86 | 17.17 | 13.96          | 14.42 | 14.95 | 15.42 | 16.73 |
|                 | 12H  | 14.47            | 14.89 | 15.48 | 15.91 | 17.22 | 14.02          | 14.44 | 15.03 | 15.46 | 16.77 |
| 8H              | 4H   | 13.92            | 14.39 | 14.91 | 15.39 | 16.69 | 13.54          | 14.01 | 14.54 | 15.01 | 16.32 |
|                 | 6H   | 14.56            | 14.94 | 15.58 | 15.98 | 17.29 | 14.17          | 14.56 | 15.19 | 15.60 | 16.91 |
|                 | 8H   | 14.78            | 15.12 | 15.81 | 16.15 | 17.47 | 14.39          | 14.73 | 15.42 | 15.76 | 17.08 |
|                 | 12H  | 14.92            | 15.22 | 15.95 | 16.24 | 17.61 | 14.51          | 14.81 | 15.54 | 15.83 | 17.20 |
| 12H             | 4H   | 13.91            | 14.33 | 14.92 | 15.34 | 16.66 | 13.54          | 13.96 | 14.55 | 14.98 | 16.29 |
|                 | 6H   | 14.59            | 14.93 | 15.61 | 15.96 | 17.28 | 14.22          | 14.56 | 15.24 | 15.59 | 16.91 |
|                 | 8H   | 14.84            | 15.13 | 15.86 | 16.16 | 17.52 | 14.46          | 14.75 | 15.48 | 15.78 | 17.14 |