

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: P912204

Luminaire Tested: DFN2DIP-SQ4F0-080D090US850-FLLFLL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P912204  
REPORT IS A COMBINATION OF REPORTS P900117 AND P896915  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-SQ4F0-080D090US850-FLLFLL  
Description: 4 foot, Square Define Geo, with Direct Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

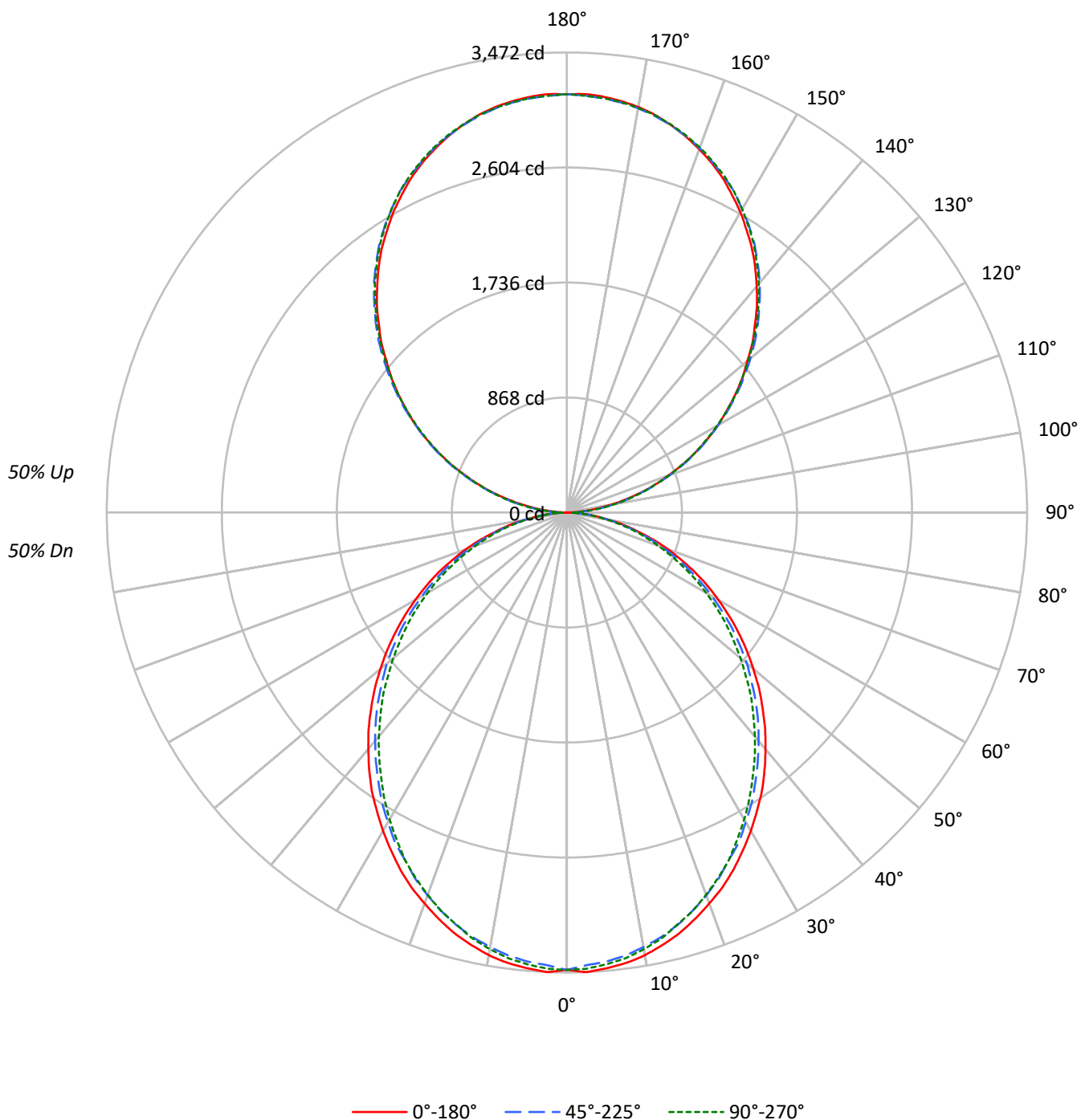
Lumens per Lamp: N/A  
Luminaire Lumens: 17616.5 lumens  
Efficiency: N/A  
Efficacy: 127.6 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 3.92' x L: 3.92' x H: 0.1')  
CIE Type: General Diffuse

Input Watts (W): 138.1  
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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CATALOG NUMBER: DFN2DIP-SQ4F0-080D090US850-FLLFLL

### Luminous Intensity Polar Plot



TEST NUMBER: P912204

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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 | 75 | 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  | 63  | 56  | 50  | 68 | 59 | 52 | 46 | 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 | 25 |
| 6   | 63  | 51  | 43  | 37  | 58 | 47 | 40 | 35 | 40 | 35 | 31 | 34 | 30 | 26 | 28 | 25 | 22 |
| 7   | 58  | 46  | 38  | 32  | 53 | 43 | 36 | 30 | 37 | 31 | 27 | 31 | 27 | 23 | 26 | 22 | 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°  | 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: 90°

Vertical Angle: 90°

Luminance: 2484 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 324.9   | 1.8       |
| 10°-20°   | 914.2   | 5.2       |
| 20°-30°   | 1343.5  | 7.6       |
| 30°-40°   | 1560.4  | 8.9       |
| 40°-50°   | 1558.4  | 8.8       |
| 50°-60°   | 1358.9  | 7.7       |
| 60°-70°   | 1004.5  | 5.7       |
| 70°-80°   | 568.4   | 3.2       |
| 80°-90°   | 159.0   | 0.9       |
| 90°-100°  | 195.3   | 1.1       |
| 100°-110° | 620.6   | 3.5       |
| 110°-120° | 1062.1  | 6.0       |
| 120°-130° | 1396.8  | 7.9       |
| 130°-140° | 1567.9  | 8.9       |
| 140°-150° | 1537.5  | 8.7       |
| 150°-160° | 1289.7  | 7.3       |
| 160°-170° | 855.3   | 4.9       |
| 170°-180° | 299.0   | 1.7       |
| 0°-30°    | 2582.6  | 14.7      |
| 0°-40°    | 4143.0  | 23.5      |
| 0°-60°    | 7060.4  | 40.1      |
| 0°-90°    | 8792.2  | 49.9      |
| 90°-120°  | 1878.1  | 10.7      |
| 90°-150°  | 6380.2  | 36.2      |
| 90°-180°  | 8824.0  | 50.1      |
| 0°-180°   | 17616.5 | 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°  | 3    | 34    | 93   | 88    | 90   | 17   |
| 95°  | 139  | 166   | 170  | 170   | 166  | 155  |
| 105° | 573  | 580   | 586  | 591   | 591  | 605  |
| 115° | 1066 | 1081  | 1076 | 1074  | 1066 | 1054 |
| 125° | 1550 | 1574  | 1566 | 1558  | 1555 | 1385 |
| 135° | 2005 | 2035  | 2040 | 2038  | 2030 | 1550 |
| 145° | 2434 | 2453  | 2468 | 2471  | 2461 | 1521 |
| 155° | 2784 | 2791  | 2800 | 2813  | 2805 | 1281 |
| 165° | 3028 | 3025  | 3025 | 3044  | 3031 | 854  |
| 175° | 3151 | 3143  | 3138 | 3157  | 3140 | 299  |
| 180° | 3157 | 3157  | 3157 | 3157  | 3157 |      |

TEST NUMBER: P912204

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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°    | 2.9    | 34.3   | 93.3   | 87.5   | 90.4   |
| 92.5°  | 59.0   | 80.0   | 82.8   | 85.6   | 85.6   |
| 95°    | 139.0  | 165.6  | 170.3  | 170.3  | 165.6  |
| 97.5°  | 231.2  | 256.0  | 266.5  | 266.5  | 266.5  |
| 100°   | 337.8  | 359.8  | 367.3  | 367.3  | 364.5  |
| 102.5° | 450.1  | 466.3  | 476.8  | 479.6  | 476.8  |
| 105°   | 572.9  | 580.5  | 586.2  | 591.0  | 591.0  |
| 107.5° | 694.7  | 706.1  | 706.1  | 708.0  | 694.7  |
| 110°   | 812.7  | 828.0  | 828.0  | 828.0  | 820.3  |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 940.2  | 956.4  | 953.5  | 946.0  | 940.2  |
| 115°   | 1065.9 | 1081.1 | 1076.3 | 1073.5 | 1065.9 |
| 117.5° | 1190.5 | 1211.5 | 1198.2 | 1190.5 | 1182.9 |
| 120°   | 1316.2 | 1337.0 | 1316.2 | 1316.2 | 1307.5 |
| 122.5° | 1430.3 | 1457.0 | 1443.7 | 1436.0 | 1430.3 |
| 125°   | 1550.3 | 1574.0 | 1566.5 | 1557.8 | 1555.0 |
| 127.5° | 1667.3 | 1696.8 | 1686.3 | 1674.9 | 1667.3 |
| 130°   | 1776.7 | 1811.0 | 1806.2 | 1800.5 | 1790.0 |
| 132.5° | 1899.5 | 1926.1 | 1928.0 | 1914.7 | 1907.1 |
| 135°   | 2005.1 | 2034.6 | 2040.3 | 2037.5 | 2029.9 |
| 137.5° | 2123.1 | 2146.9 | 2151.7 | 2149.8 | 2138.4 |
| 140°   | 2226.9 | 2250.6 | 2263.9 | 2263.9 | 2253.5 |
| 142.5° | 2333.4 | 2357.2 | 2364.8 | 2367.7 | 2357.2 |
| 145°   | 2434.4 | 2453.3 | 2468.5 | 2471.4 | 2461.0 |
| 147.5° | 2524.7 | 2548.5 | 2559.9 | 2564.7 | 2554.2 |
| 150°   | 2618.0 | 2634.2 | 2644.6 | 2653.2 | 2644.6 |
| 152.5° | 2700.7 | 2716.9 | 2730.2 | 2740.8 | 2730.2 |
| 155°   | 2783.6 | 2791.1 | 2799.8 | 2813.1 | 2804.6 |
| 157.5° | 2854.9 | 2860.7 | 2865.4 | 2884.4 | 2871.1 |
| 160°   | 2918.7 | 2924.4 | 2927.3 | 2943.4 | 2932.0 |
| 162.5° | 2977.7 | 2977.7 | 2980.5 | 2998.6 | 2985.3 |
| 165°   | 3028.1 | 3025.2 | 3025.2 | 3044.3 | 3031.0 |
| 167.5° | 3073.8 | 3065.3 | 3065.3 | 3084.2 | 3070.9 |
| 170°   | 3108.1 | 3100.4 | 3097.7 | 3116.6 | 3100.4 |
| 172.5° | 3131.8 | 3124.3 | 3121.4 | 3140.5 | 3124.3 |
| 175°   | 3150.9 | 3143.2 | 3137.6 | 3156.7 | 3140.5 |
| 177.5° | 3161.3 | 3153.8 | 3148.0 | 3164.2 | 3148.0 |
| 180°   | 3156.7 | 3156.7 | 3156.7 | 3156.7 | 3156.7 |

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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 | 10.35            | 11.21 | 11.31 | 12.18 | 13.46 | 9.90           | 10.76 | 10.86 | 11.74 | 13.01 |
|                 | 3H   | 12.01            | 12.79 | 12.98 | 13.77 | 15.06 | 11.52          | 12.29 | 12.49 | 13.28 | 14.57 |
|                 | 4H   | 12.60            | 13.33 | 13.59 | 14.32 | 15.62 | 12.11          | 12.84 | 13.09 | 13.83 | 15.13 |
|                 | 6H   | 13.01            | 13.68 | 14.00 | 14.67 | 15.99 | 12.51          | 13.18 | 13.50 | 14.17 | 15.49 |
|                 | 8H   | 13.11            | 13.75 | 14.11 | 14.76 | 16.08 | 12.61          | 13.25 | 13.61 | 14.26 | 15.57 |
|                 | 12H  | 13.16            | 13.77 | 14.17 | 14.78 | 16.11 | 12.65          | 13.26 | 13.66 | 14.27 | 15.60 |
| 4H              | 2H   | 10.81            | 11.54 | 11.80 | 12.53 | 13.83 | 10.46          | 11.19 | 11.44 | 12.17 | 13.48 |
|                 | 3H   | 12.68            | 13.29 | 13.68 | 14.31 | 15.62 | 12.27          | 12.88 | 13.27 | 13.90 | 15.22 |
|                 | 4H   | 13.40            | 13.96 | 14.40 | 14.96 | 16.30 | 12.97          | 13.53 | 13.98 | 14.54 | 15.88 |
|                 | 6H   | 13.92            | 14.40 | 14.93 | 15.43 | 16.77 | 13.49          | 13.97 | 14.50 | 15.00 | 16.33 |
|                 | 8H   | 14.07            | 14.52 | 15.09 | 15.54 | 16.90 | 13.63          | 14.08 | 14.65 | 15.11 | 16.46 |
|                 | 12H  | 14.14            | 14.55 | 15.18 | 15.59 | 16.95 | 13.70          | 14.10 | 14.73 | 15.14 | 16.50 |
| 8H              | 4H   | 13.59            | 14.04 | 14.61 | 15.07 | 16.42 | 13.22          | 13.67 | 14.24 | 14.69 | 16.04 |
|                 | 6H   | 14.23            | 14.60 | 15.27 | 15.67 | 17.02 | 13.85          | 14.22 | 14.89 | 15.29 | 16.64 |
|                 | 8H   | 14.45            | 14.78 | 15.51 | 15.83 | 17.20 | 14.06          | 14.39 | 15.11 | 15.44 | 16.81 |
|                 | 12H  | 14.59            | 14.88 | 15.64 | 15.92 | 17.34 | 14.18          | 14.47 | 15.23 | 15.51 | 16.92 |
| 12H             | 4H   | 13.58            | 13.99 | 14.62 | 15.03 | 16.38 | 13.21          | 13.62 | 14.25 | 14.66 | 16.02 |
|                 | 6H   | 14.26            | 14.59 | 15.31 | 15.64 | 17.01 | 13.89          | 14.22 | 14.94 | 15.27 | 16.64 |
|                 | 8H   | 14.51            | 14.79 | 15.56 | 15.84 | 17.25 | 14.13          | 14.41 | 15.18 | 15.46 | 16.87 |