

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: P909341

Luminaire Tested: DFN2DIP-SQ3F0-110D090US840-FLLONL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P909341  
REPORT IS A COMBINATION OF REPORTS P901485 AND P898289  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-SQ3F0-110D090US840-FLLONL  
Description: 3 foot, Square Define Geo, with Direct Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

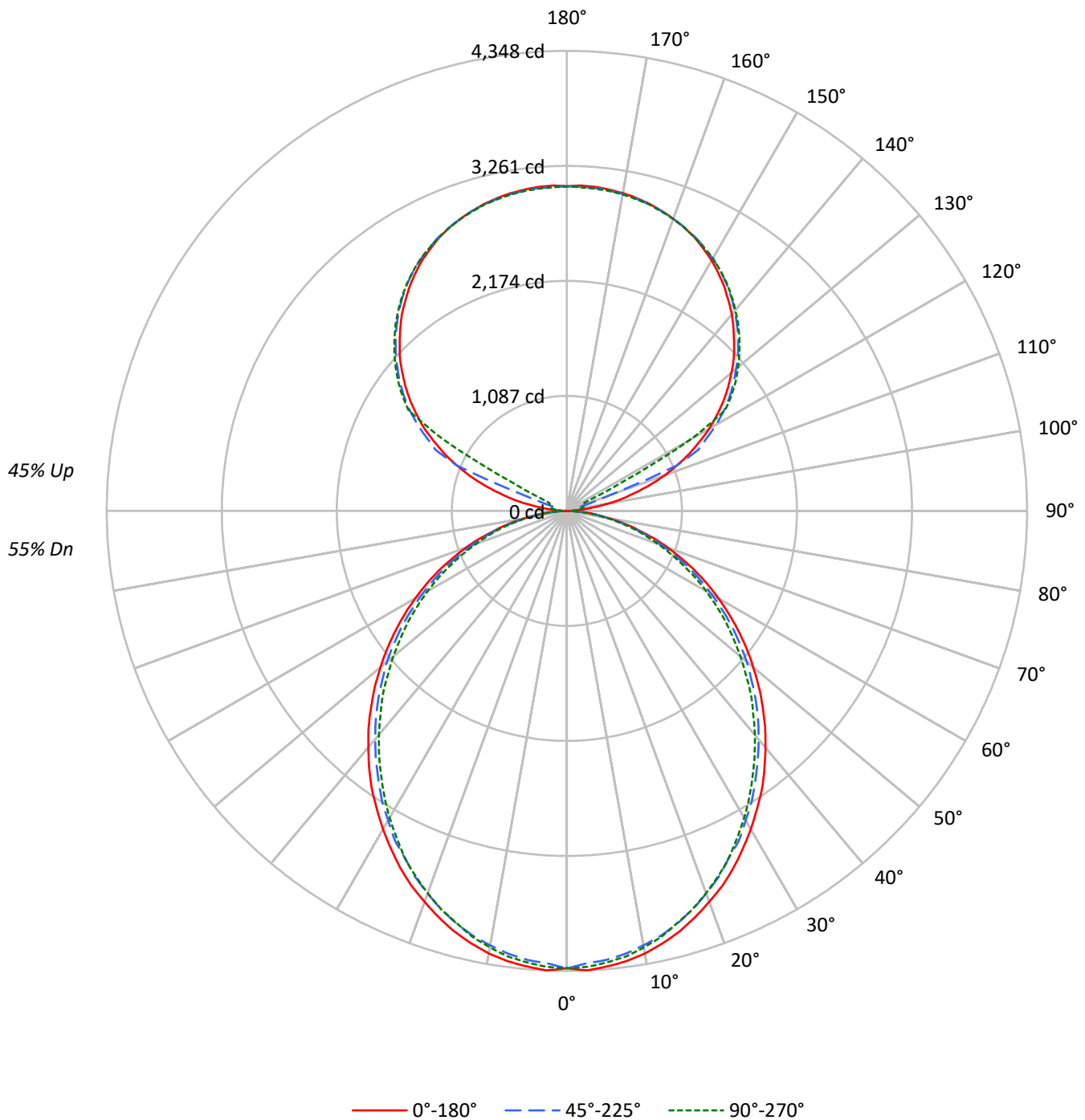
Lumens per Lamp: N/A  
Luminaire Lumens: 19995.3 lumens  
Efficiency: N/A  
Efficacy: 110.8 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 3.06' x L: 3.06' x H: 0.1')  
CIE Type: General Diffuse

Input Watts (W): 180.4  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9977  
Total Harmonic Distortion (THDi): 0.049  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT

TEST NUMBER: P909341

CATALOG NUMBER: DFN2DIP-SQ3F0-110D090US840-FLLONL

### Luminous Intensity Polar Plot



TEST NUMBER: P909341

CATALOG NUMBER: DFN2DIP-SQ3F0-110D090US840-FLONL

**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 | 101 | 101 | 101 | 101 | 86 | 86 | 86 | 73 | 73 | 73 | 61 | 61 | 61 |
| 1   | 99  | 95  | 91  | 87  | 92  | 88  | 85  | 81  | 76 | 73 | 71 | 64 | 62 | 61 | 54 | 52 | 51 |
| 2   | 90  | 83  | 76  | 71  | 83  | 77  | 71  | 67  | 66 | 62 | 59 | 56 | 53 | 51 | 47 | 45 | 43 |
| 3   | 82  | 73  | 65  | 59  | 76  | 68  | 61  | 56  | 58 | 53 | 49 | 50 | 46 | 43 | 42 | 39 | 37 |
| 4   | 75  | 64  | 56  | 50  | 70  | 60  | 53  | 47  | 52 | 46 | 42 | 44 | 40 | 37 | 37 | 34 | 32 |
| 5   | 69  | 57  | 49  | 43  | 64  | 54  | 46  | 41  | 47 | 41 | 36 | 40 | 35 | 32 | 34 | 30 | 28 |
| 6   | 64  | 51  | 43  | 37  | 59  | 48  | 41  | 35  | 42 | 36 | 32 | 36 | 32 | 28 | 31 | 27 | 24 |
| 7   | 59  | 46  | 38  | 33  | 55  | 44  | 36  | 31  | 38 | 32 | 28 | 33 | 28 | 25 | 28 | 24 | 22 |
| 8   | 55  | 42  | 34  | 29  | 51  | 40  | 33  | 28  | 35 | 29 | 25 | 30 | 25 | 22 | 26 | 22 | 19 |
| 9   | 51  | 39  | 31  | 26  | 47  | 36  | 29  | 25  | 32 | 26 | 22 | 28 | 23 | 20 | 24 | 20 | 18 |
| 10  | 48  | 35  | 28  | 23  | 44  | 33  | 27  | 22  | 29 | 24 | 20 | 26 | 21 | 18 | 22 | 19 | 16 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 4953 | 4953 | 4953 |
| 5°  | 4957 | 4880 | 4915 |
| 10° | 4914 | 4811 | 4847 |
| 15° | 4839 | 4729 | 4741 |
| 20° | 4738 | 4615 | 4633 |
| 25° | 4638 | 4481 | 4509 |
| 30° | 4512 | 4355 | 4350 |
| 35° | 4394 | 4207 | 4183 |
| 40° | 4248 | 4058 | 4024 |
| 45° | 4103 | 3908 | 3861 |
| 50° | 3944 | 3750 | 3673 |
| 55° | 3777 | 3568 | 3499 |
| 60° | 3588 | 3352 | 3300 |
| 65° | 3381 | 3128 | 3065 |
| 70° | 3118 | 2854 | 2812 |
| 75° | 2755 | 2526 | 2576 |
| 80° | 2316 | 2108 | 2129 |
| 85° | 1631 | 1397 | 1393 |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°  
Vertical Angle: 45°  
Luminance: 4103 cd/sqm

TEST NUMBER: P909341

CATALOG NUMBER: DFN2DIP-SQ3F0-110D090US840-FLONL

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 406.8   | 2.0       |
| 10°-20°   | 1144.7  | 5.7       |
| 20°-30°   | 1682.2  | 8.4       |
| 30°-40°   | 1953.7  | 9.8       |
| 40°-50°   | 1951.3  | 9.8       |
| 50°-60°   | 1701.5  | 8.5       |
| 60°-70°   | 1257.8  | 6.3       |
| 70°-80°   | 711.6   | 3.6       |
| 80°-90°   | 193.2   | 1.0       |
| 90°-100°  | 101.2   | 0.5       |
| 100°-110° | 377.0   | 1.9       |
| 110°-120° | 1000.0  | 5.0       |
| 120°-130° | 1658.6  | 8.3       |
| 130°-140° | 1761.8  | 8.8       |
| 140°-150° | 1637.4  | 8.2       |
| 150°-160° | 1316.4  | 6.6       |
| 160°-170° | 848.2   | 4.2       |
| 170°-180° | 292.0   | 1.5       |
| 0°-30°    | 3233.7  | 16.2      |
| 0°-40°    | 5187.4  | 25.9      |
| 0°-60°    | 8840.2  | 44.2      |
| 0°-90°    | 11002.8 | 55.0      |
| 90°-120°  | 1478.2  | 7.4       |
| 90°-150°  | 6535.9  | 32.7      |
| 90°-180°  | 8992.0  | 45.0      |
| 0°-180°   | 19995.3 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 4322 | 4322  | 4322 | 4322  | 4322 |      |
| 5°   | 4322 | 4306  | 4260 | 4293  | 4285 | 410  |
| 15°  | 4115 | 4090  | 4036 | 4052  | 4032 | 1159 |
| 25°  | 3724 | 3691  | 3620 | 3628  | 3620 | 1714 |
| 35°  | 3213 | 3172  | 3105 | 3080  | 3059 | 2006 |
| 45°  | 2614 | 2585  | 2523 | 2477  | 2461 | 2018 |
| 55°  | 1979 | 1954  | 1904 | 1854  | 1833 | 1769 |
| 65°  | 1334 | 1309  | 1268 | 1230  | 1210 | 1319 |
| 75°  | 698  | 690   | 669  | 644   | 653  | 745  |
| 85°  | 170  | 166   | 162  | 150   | 146  | 190  |
| 90°  | 2    | 27    | 44   | 56    | 60   | 18   |
| 95°  | 144  | 71    | 86   | 98    | 95   | 171  |
| 105° | 675  | 741   | 135  | 160   | 169  | 721  |
| 115° | 1276 | 1314  | 1370 | 342   | 182  | 1256 |
| 125° | 1804 | 1833  | 1876 | 1891  | 1898 | 1609 |
| 135° | 2233 | 2268  | 2288 | 2311  | 2306 | 1725 |
| 145° | 2590 | 2588  | 2626 | 2641  | 2630 | 1620 |
| 155° | 2852 | 2832  | 2859 | 2872  | 2854 | 1314 |
| 165° | 3005 | 2992  | 2999 | 3014  | 2999 | 849  |
| 175° | 3074 | 3058  | 3063 | 3078  | 3056 | 293  |
| 180° | 3067 | 3067  | 3067 | 3067  | 3067 |      |

TEST NUMBER: P909341

CATALOG NUMBER: DFN2DIP-SQ3F0-110D090US840-FLONL

**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 4322.4 | 4322.4 | 4322.4 | 4322.4 | 4322.4 |
| 2.5°   | 4347.5 | 4326.8 | 4280.9 | 4322.4 | 4314.4 |
| 5°     | 4322.4 | 4306.1 | 4260.2 | 4293.2 | 4285.4 |
| 7.5°   | 4293.2 | 4268.6 | 4222.8 | 4256.3 | 4247.9 |
| 10°    | 4247.9 | 4218.7 | 4168.9 | 4201.9 | 4189.6 |
| 12.5°  | 4185.3 | 4160.5 | 4110.8 | 4131.5 | 4123.1 |
| 15°    | 4114.7 | 4090.0 | 4035.7 | 4052.5 | 4031.8 |
| 17.5°  | 4027.3 | 4002.7 | 3948.5 | 3969.2 | 3948.5 |
| 20°    | 3931.7 | 3907.0 | 3848.8 | 3861.1 | 3844.9 |
| 22.5°  | 3836.5 | 3798.9 | 3744.7 | 3744.7 | 3736.3 |
| 25°    | 3724.0 | 3691.0 | 3620.4 | 3628.3 | 3620.4 |
| 27.5°  | 3599.2 | 3570.1 | 3516.3 | 3503.9 | 3483.2 |
| 30°    | 3474.8 | 3441.3 | 3379.1 | 3366.8 | 3350.0 |
| 32.5°  | 3341.6 | 3317.0 | 3250.4 | 3225.2 | 3208.4 |
| 35°    | 3212.9 | 3171.5 | 3104.8 | 3079.7 | 3059.0 |
| 37.5°  | 3067.4 | 3029.9 | 2963.3 | 2934.2 | 2913.5 |
| 40°    | 2917.9 | 2884.4 | 2817.8 | 2780.8 | 2764.0 |
| 42.5°  | 2772.4 | 2738.9 | 2672.7 | 2630.8 | 2606.2 |
| 45°    | 2614.5 | 2585.4 | 2522.7 | 2477.4 | 2460.6 |
| 47.5°  | 2460.6 | 2431.6 | 2364.9 | 2319.1 | 2294.3 |
| 50°    | 2298.4 | 2277.7 | 2219.4 | 2161.2 | 2140.5 |
| 52.5°  | 2140.5 | 2111.3 | 2057.6 | 2011.7 | 1982.6 |
| 55°    | 1978.6 | 1953.5 | 1903.7 | 1853.8 | 1833.1 |
| 57.5°  | 1816.3 | 1795.6 | 1741.4 | 1691.5 | 1674.8 |
| 60°    | 1654.1 | 1637.8 | 1579.5 | 1533.7 | 1521.4 |
| 62.5°  | 1496.2 | 1467.1 | 1425.6 | 1384.2 | 1367.5 |
| 65°    | 1334.3 | 1309.2 | 1267.8 | 1230.3 | 1209.6 |
| 67.5°  | 1168.1 | 1147.0 | 1109.9 | 1080.9 | 1064.1 |
| 70°    | 1014.2 | 997.4  | 960.0  | 930.9  | 914.5  |
| 72.5°  | 856.4  | 839.6  | 818.9  | 789.8  | 777.4  |
| 75°    | 698.0  | 690.1  | 668.9  | 644.3  | 652.7  |
| 77.5°  | 556.9  | 540.2  | 531.8  | 519.5  | 507.2  |
| 80°    | 415.9  | 411.4  | 403.0  | 390.7  | 382.3  |
| 82.5°  | 282.7  | 282.7  | 278.7  | 262.0  | 262.0  |
| 85°    | 170.3  | 166.2  | 162.3  | 149.5  | 145.5  |
| 87.5°  | 74.9   | 66.6   | 58.2   | 45.8   | 41.4   |
| 90°    | 2.1    | 26.7   | 44.2   | 55.6   | 59.8   |
| 92.5°  | 55.6   | 46.7   | 53.2   | 57.8   | 59.8   |
| 95°    | 144.2  | 70.9   | 86.4   | 97.8   | 95.4   |
| 97.5°  | 259.6  | 77.8   | 113.1  | 119.9  | 122.0  |
| 100°   | 392.9  | 88.9   | 126.5  | 144.2  | 148.7  |
| 102.5° | 539.3  | 535.0  | 131.0  | 155.2  | 162.1  |
| 105°   | 674.7  | 741.4  | 135.4  | 159.8  | 168.6  |
| 107.5° | 832.3  | 887.7  | 140.0  | 164.2  | 173.2  |
| 110°   | 983.3  | 1029.8 | 388.5  | 166.5  | 175.3  |

TEST NUMBER: P909341

CATALOG NUMBER: DFN2DIP-SQ3F0-110D090US840-FLLONL

**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 1125.4 | 1165.2 | 1127.5 | 170.8  | 177.6  |
| 115°   | 1276.2 | 1313.8 | 1369.5 | 341.8  | 182.1  |
| 117.5° | 1407.1 | 1451.5 | 1489.3 | 1171.8 | 590.4  |
| 120°   | 1553.7 | 1586.9 | 1627.0 | 1653.6 | 1353.9 |
| 122.5° | 1677.9 | 1713.4 | 1758.0 | 1771.1 | 1773.5 |
| 125°   | 1804.3 | 1833.3 | 1875.5 | 1891.1 | 1897.6 |
| 127.5° | 1919.8 | 1950.9 | 1984.4 | 2006.5 | 2008.6 |
| 130°   | 2028.6 | 2064.3 | 2088.5 | 2112.9 | 2110.9 |
| 132.5° | 2139.6 | 2168.6 | 2192.8 | 2212.9 | 2210.8 |
| 135°   | 2232.9 | 2268.5 | 2288.3 | 2310.7 | 2306.2 |
| 137.5° | 2330.5 | 2357.0 | 2379.4 | 2401.6 | 2395.0 |
| 140°   | 2425.8 | 2443.8 | 2468.0 | 2488.0 | 2477.0 |
| 142.5° | 2506.0 | 2521.5 | 2550.2 | 2567.9 | 2556.9 |
| 145°   | 2590.3 | 2587.9 | 2625.7 | 2641.2 | 2630.1 |
| 147.5° | 2663.3 | 2656.8 | 2694.4 | 2705.5 | 2696.7 |
| 150°   | 2734.5 | 2719.0 | 2754.5 | 2767.6 | 2756.6 |
| 152.5° | 2794.3 | 2776.6 | 2809.8 | 2823.3 | 2807.7 |
| 155°   | 2852.1 | 2832.3 | 2858.8 | 2872.1 | 2854.4 |
| 157.5° | 2898.7 | 2881.0 | 2901.0 | 2916.6 | 2898.7 |
| 160°   | 2938.7 | 2925.3 | 2938.7 | 2951.9 | 2936.4 |
| 162.5° | 2974.1 | 2960.8 | 2971.9 | 2987.5 | 2967.5 |
| 165°   | 3005.2 | 2991.9 | 2998.6 | 3014.1 | 2998.6 |
| 167.5° | 3029.7 | 3016.3 | 3023.0 | 3038.6 | 3018.6 |
| 170°   | 3049.7 | 3036.3 | 3040.7 | 3056.3 | 3036.3 |
| 172.5° | 3062.9 | 3049.7 | 3054.1 | 3069.7 | 3049.7 |
| 175°   | 3073.9 | 3058.4 | 3062.9 | 3078.4 | 3056.3 |
| 177.5° | 3078.4 | 3062.9 | 3065.2 | 3080.8 | 3060.8 |
| 180°   | 3067.4 | 3067.4 | 3067.4 | 3067.4 | 3067.4 |

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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 | 13.25            | 14.16 | 14.16 | 15.09 | 16.29 | 12.80          | 13.71 | 13.72 | 14.64 | 15.84 |
|                 | 3H   | 14.91            | 15.72 | 15.83 | 16.66 | 17.89 | 14.42          | 15.23 | 15.34 | 16.17 | 17.40 |
|                 | 4H   | 15.49            | 16.27 | 16.43 | 17.21 | 18.44 | 15.00          | 15.77 | 15.94 | 16.72 | 17.95 |
|                 | 6H   | 15.89            | 16.60 | 16.84 | 17.56 | 18.80 | 15.39          | 16.10 | 16.34 | 17.06 | 18.30 |
|                 | 8H   | 16.00            | 16.67 | 16.96 | 17.64 | 18.89 | 15.50          | 16.17 | 16.45 | 17.14 | 18.38 |
|                 | 12H  | 16.05            | 16.69 | 17.01 | 17.65 | 18.92 | 15.54          | 16.18 | 16.50 | 17.14 | 18.41 |
| 4H              | 2H   | 13.71            | 14.48 | 14.66 | 15.43 | 16.66 | 13.36          | 14.13 | 14.30 | 15.07 | 16.30 |
|                 | 3H   | 15.58            | 16.22 | 16.53 | 17.20 | 18.44 | 15.17          | 15.81 | 16.12 | 16.79 | 18.03 |
|                 | 4H   | 16.29            | 16.88 | 17.25 | 17.85 | 19.12 | 15.86          | 16.45 | 16.83 | 17.42 | 18.69 |
|                 | 6H   | 16.80            | 17.31 | 17.78 | 18.30 | 19.57 | 16.37          | 16.88 | 17.35 | 17.87 | 19.14 |
|                 | 8H   | 16.95            | 17.42 | 17.93 | 18.41 | 19.69 | 16.51          | 16.99 | 17.49 | 17.97 | 19.26 |
|                 | 12H  | 17.02            | 17.45 | 18.02 | 18.46 | 19.74 | 16.58          | 17.00 | 17.57 | 18.01 | 19.29 |
| 8H              | 4H   | 16.48            | 16.96 | 17.46 | 17.95 | 19.23 | 16.11          | 16.58 | 17.09 | 17.57 | 18.85 |
|                 | 6H   | 17.11            | 17.50 | 18.12 | 18.53 | 19.81 | 16.73          | 17.12 | 17.73 | 18.15 | 19.43 |
|                 | 8H   | 17.33            | 17.68 | 18.34 | 18.69 | 19.99 | 16.94          | 17.28 | 17.95 | 18.30 | 19.60 |
|                 | 12H  | 17.46            | 17.76 | 18.48 | 18.78 | 20.12 | 17.05          | 17.35 | 18.07 | 18.36 | 19.71 |
| 12H             | 4H   | 16.47            | 16.90 | 17.47 | 17.90 | 19.19 | 16.10          | 16.53 | 17.10 | 17.53 | 18.82 |
|                 | 6H   | 17.14            | 17.49 | 18.15 | 18.50 | 19.80 | 16.77          | 17.11 | 17.78 | 18.13 | 19.43 |
|                 | 8H   | 17.38            | 17.69 | 18.40 | 18.70 | 20.04 | 17.00          | 17.30 | 18.02 | 18.32 | 19.66 |