

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: P906549

Luminaire Tested: DFN2DIP-SQ3F0-090D110US835-FLLONL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P906549  
REPORT IS A COMBINATION OF REPORTS P901517 AND P898289  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-SQ3F0-090D110US835-FLLONL  
Description: 3 foot, Square Define Geo, with Direct Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

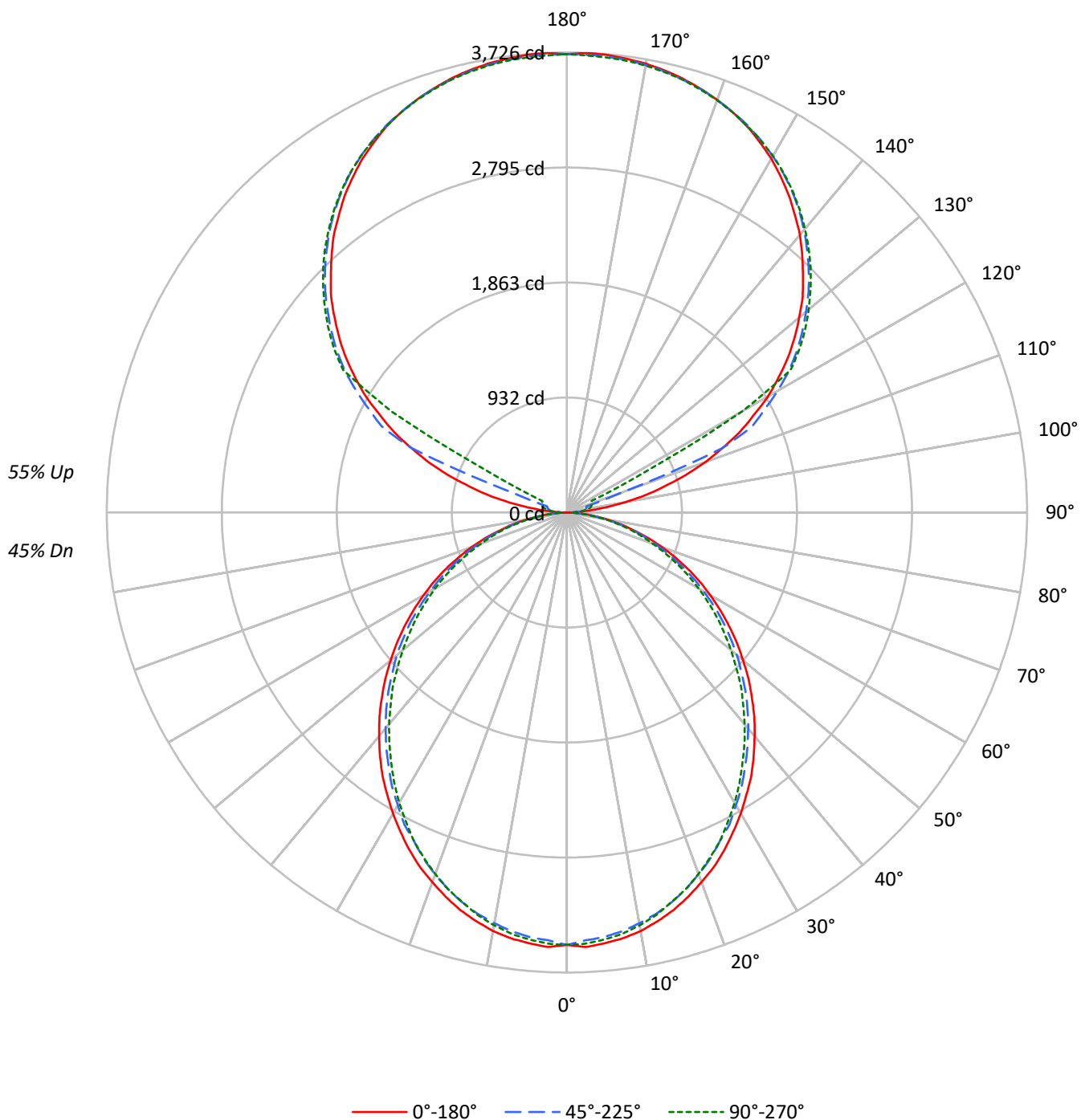
Lumens per Lamp: N/A  
Luminaire Lumens: 19800.0 lumens  
Efficiency: N/A  
Efficacy: 114.0 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 3.06' x L: 3.06' x H: 0.1')  
CIE Type: General Diffuse

Input Watts (W): 173.7  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.996  
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   | 106 | 106 | 106 | 106 | 97 | 97 | 97 | 97 | 81 | 81 | 81 | 65 | 65 | 65 | 52 | 52 | 52 |
| 1   | 97  | 92  | 89  | 85  | 88 | 85 | 82 | 79 | 71 | 68 | 66 | 58 | 56 | 54 | 46 | 45 | 44 |
| 2   | 88  | 81  | 75  | 69  | 80 | 74 | 69 | 64 | 62 | 58 | 55 | 51 | 48 | 45 | 40 | 38 | 37 |
| 3   | 80  | 71  | 64  | 58  | 73 | 65 | 59 | 54 | 55 | 50 | 46 | 45 | 41 | 38 | 36 | 33 | 31 |
| 4   | 73  | 63  | 55  | 49  | 67 | 58 | 51 | 46 | 48 | 43 | 39 | 40 | 36 | 33 | 32 | 29 | 27 |
| 5   | 67  | 56  | 48  | 42  | 61 | 52 | 44 | 39 | 43 | 38 | 34 | 36 | 32 | 29 | 29 | 26 | 23 |
| 6   | 62  | 50  | 42  | 36  | 57 | 46 | 39 | 34 | 39 | 34 | 29 | 32 | 28 | 25 | 26 | 23 | 21 |
| 7   | 57  | 45  | 37  | 32  | 52 | 42 | 35 | 30 | 35 | 30 | 26 | 29 | 25 | 22 | 24 | 21 | 18 |
| 8   | 53  | 41  | 33  | 28  | 49 | 38 | 31 | 26 | 32 | 27 | 23 | 27 | 23 | 20 | 22 | 19 | 16 |
| 9   | 50  | 37  | 30  | 25  | 45 | 35 | 28 | 23 | 30 | 24 | 21 | 25 | 21 | 18 | 20 | 17 | 15 |
| 10  | 46  | 34  | 27  | 22  | 42 | 32 | 25 | 21 | 27 | 22 | 18 | 23 | 19 | 16 | 19 | 16 | 13 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 4012 | 4012 | 4012 |
| 5°  | 4016 | 3954 | 3982 |
| 10° | 3981 | 3898 | 3927 |
| 15° | 3920 | 3831 | 3841 |
| 20° | 3838 | 3739 | 3754 |
| 25° | 3757 | 3630 | 3653 |
| 30° | 3656 | 3528 | 3525 |
| 35° | 3560 | 3408 | 3389 |
| 40° | 3442 | 3287 | 3260 |
| 45° | 3324 | 3166 | 3128 |
| 50° | 3195 | 3038 | 2976 |
| 55° | 3060 | 2890 | 2835 |
| 60° | 2907 | 2716 | 2674 |
| 65° | 2739 | 2534 | 2483 |
| 70° | 2526 | 2313 | 2278 |
| 75° | 2232 | 2047 | 2087 |
| 80° | 1876 | 1708 | 1725 |
| 85° | 1320 | 1132 | 1129 |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 3324 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 329.6   | 1.7       |
| 10°-20°   | 927.4   | 4.7       |
| 20°-30°   | 1362.9  | 6.9       |
| 30°-40°   | 1582.9  | 8.0       |
| 40°-50°   | 1580.9  | 8.0       |
| 50°-60°   | 1378.5  | 7.0       |
| 60°-70°   | 1019.0  | 5.1       |
| 70°-80°   | 576.6   | 2.9       |
| 80°-90°   | 158.7   | 0.8       |
| 90°-100°  | 122.4   | 0.6       |
| 100°-110° | 456.3   | 2.3       |
| 110°-120° | 1210.3  | 6.1       |
| 120°-130° | 2007.3  | 10.1      |
| 130°-140° | 2132.2  | 10.8      |
| 140°-150° | 1981.7  | 10.0      |
| 150°-160° | 1593.2  | 8.0       |
| 160°-170° | 1026.6  | 5.2       |
| 170°-180° | 353.3   | 1.8       |
| 0°-30°    | 2619.9  | 13.2      |
| 0°-40°    | 4202.8  | 21.2      |
| 0°-60°    | 7162.3  | 36.2      |
| 0°-90°    | 8916.5  | 45.0      |
| 90°-120°  | 1789.0  | 9.0       |
| 90°-150°  | 7910.3  | 40.0      |
| 90°-180°  | 10883.0 | 55.0      |
| 0°-180°   | 19800.0 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 3502 | 3502  | 3502 | 3502  | 3502 |      |
| 5°   | 3502 | 3489  | 3452 | 3478  | 3472 | 332  |
| 15°  | 3334 | 3314  | 3270 | 3283  | 3266 | 939  |
| 25°  | 3017 | 2990  | 2933 | 2940  | 2933 | 1388 |
| 35°  | 2603 | 2570  | 2516 | 2495  | 2478 | 1626 |
| 45°  | 2118 | 2095  | 2044 | 2007  | 1994 | 1635 |
| 55°  | 1603 | 1583  | 1542 | 1502  | 1485 | 1433 |
| 65°  | 1081 | 1061  | 1027 | 997   | 980  | 1069 |
| 75°  | 566  | 559   | 542  | 522   | 529  | 604  |
| 85°  | 138  | 135   | 132  | 121   | 118  | 154  |
| 90°  | 3    | 32    | 54   | 67    | 72   | 18   |
| 95°  | 174  | 86    | 105  | 118   | 116  | 207  |
| 105° | 817  | 897   | 164  | 193   | 204  | 873  |
| 115° | 1544 | 1590  | 1658 | 414   | 220  | 1521 |
| 125° | 2184 | 2219  | 2270 | 2289  | 2297 | 1948 |
| 135° | 2702 | 2746  | 2769 | 2797  | 2791 | 2088 |
| 145° | 3135 | 3132  | 3178 | 3197  | 3183 | 1961 |
| 155° | 3452 | 3428  | 3460 | 3476  | 3455 | 1591 |
| 165° | 3637 | 3621  | 3629 | 3648  | 3629 | 1028 |
| 175° | 3720 | 3702  | 3707 | 3726  | 3699 | 354  |
| 180° | 3712 | 3712  | 3712 | 3712  | 3712 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 3501.9 | 3501.9 | 3501.9 | 3501.9 | 3501.9 |
| 2.5°   | 3522.3 | 3505.5 | 3468.4 | 3501.9 | 3495.5 |
| 5°     | 3501.9 | 3488.7 | 3451.6 | 3478.4 | 3471.9 |
| 7.5°   | 3478.4 | 3458.4 | 3421.2 | 3448.4 | 3441.6 |
| 10°    | 3441.6 | 3418.0 | 3377.6 | 3404.4 | 3394.4 |
| 12.5°  | 3390.8 | 3370.8 | 3330.5 | 3347.2 | 3340.5 |
| 15°    | 3333.7 | 3313.7 | 3269.7 | 3283.3 | 3266.5 |
| 17.5°  | 3262.9 | 3242.9 | 3199.0 | 3215.8 | 3199.0 |
| 20°    | 3185.4 | 3165.4 | 3118.2 | 3128.2 | 3115.0 |
| 22.5°  | 3108.2 | 3077.9 | 3033.9 | 3033.9 | 3027.1 |
| 25°    | 3017.1 | 2990.3 | 2933.2 | 2939.6 | 2933.2 |
| 27.5°  | 2916.0 | 2892.4 | 2848.9 | 2838.9 | 2822.1 |
| 30°    | 2815.3 | 2788.1 | 2737.7 | 2727.7 | 2714.2 |
| 32.5°  | 2707.4 | 2687.4 | 2633.4 | 2613.1 | 2599.5 |
| 35°    | 2603.1 | 2569.5 | 2515.5 | 2495.2 | 2478.4 |
| 37.5°  | 2485.2 | 2454.8 | 2400.8 | 2377.3 | 2360.5 |
| 40°    | 2364.0 | 2336.9 | 2282.9 | 2252.9 | 2239.4 |
| 42.5°  | 2246.1 | 2219.0 | 2165.4 | 2131.5 | 2111.5 |
| 45°    | 2118.2 | 2094.7 | 2043.9 | 2007.1 | 1993.6 |
| 47.5°  | 1993.6 | 1970.0 | 1916.0 | 1878.9 | 1858.9 |
| 50°    | 1862.1 | 1845.3 | 1798.1 | 1751.0 | 1734.2 |
| 52.5°  | 1734.2 | 1710.6 | 1667.0 | 1629.9 | 1606.3 |
| 55°    | 1603.1 | 1582.7 | 1542.3 | 1502.0 | 1485.2 |
| 57.5°  | 1471.6 | 1454.8 | 1410.9 | 1370.5 | 1356.9 |
| 60°    | 1340.1 | 1326.9 | 1279.7 | 1242.6 | 1232.6 |
| 62.5°  | 1212.2 | 1188.6 | 1155.0 | 1121.5 | 1107.9 |
| 65°    | 1081.1 | 1060.7 | 1027.1 | 996.8  | 980.0  |
| 67.5°  | 946.4  | 929.3  | 899.2  | 875.7  | 862.1  |
| 70°    | 821.7  | 808.1  | 777.8  | 754.2  | 741.0  |
| 72.5°  | 693.8  | 680.2  | 663.4  | 639.9  | 629.9  |
| 75°    | 565.6  | 559.1  | 542.0  | 522.0  | 528.8  |
| 77.5°  | 451.2  | 437.7  | 430.9  | 420.9  | 410.9  |
| 80°    | 336.9  | 333.3  | 326.5  | 316.5  | 309.8  |
| 82.5°  | 229.0  | 229.0  | 225.8  | 212.2  | 212.2  |
| 85°    | 137.9  | 134.7  | 131.5  | 121.1  | 117.9  |
| 87.5°  | 60.7   | 53.9   | 47.2   | 37.2   | 33.6   |
| 90°    | 2.6    | 32.2   | 53.6   | 67.3   | 72.4   |
| 92.5°  | 67.3   | 56.5   | 64.4   | 69.9   | 72.4   |
| 95°    | 174.5  | 85.8   | 104.6  | 118.3  | 115.5  |
| 97.5°  | 314.2  | 94.1   | 136.8  | 145.1  | 147.7  |
| 100°   | 475.6  | 107.5  | 153.1  | 174.5  | 179.9  |
| 102.5° | 652.6  | 647.5  | 158.5  | 187.9  | 196.2  |
| 105°   | 816.6  | 897.3  | 164.0  | 193.3  | 204.2  |
| 107.5° | 1007.4 | 1074.3 | 169.4  | 198.7  | 209.6  |
| 110°   | 1190.1 | 1246.3 | 470.2  | 201.6  | 212.1  |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 1362.1 | 1410.2 | 1364.6 | 206.7  | 215.0  |
| 115°   | 1544.5 | 1590.1 | 1657.5 | 413.7  | 220.4  |
| 117.5° | 1703.1 | 1756.7 | 1802.6 | 1418.2 | 714.5  |
| 120°   | 1880.4 | 1920.6 | 1969.1 | 2001.3 | 1638.6 |
| 122.5° | 2030.7 | 2073.7 | 2127.6 | 2143.6 | 2146.5 |
| 125°   | 2183.8 | 2218.9 | 2269.9 | 2288.7 | 2296.7 |
| 127.5° | 2323.5 | 2361.1 | 2401.6 | 2428.4 | 2431.0 |
| 130°   | 2455.2 | 2498.3 | 2527.6 | 2557.3 | 2554.8 |
| 132.5° | 2589.5 | 2624.6 | 2654.0 | 2678.2 | 2675.7 |
| 135°   | 2702.5 | 2745.5 | 2769.4 | 2796.6 | 2791.1 |
| 137.5° | 2820.5 | 2852.7 | 2879.8 | 2906.6 | 2898.6 |
| 140°   | 2936.0 | 2957.6 | 2987.0 | 3011.2 | 2997.8 |
| 142.5° | 3032.9 | 3051.7 | 3086.5 | 3107.9 | 3094.5 |
| 145°   | 3135.0 | 3132.1 | 3177.7 | 3196.6 | 3183.2 |
| 147.5° | 3223.4 | 3215.4 | 3261.0 | 3274.4 | 3263.9 |
| 150°   | 3309.5 | 3290.7 | 3333.7 | 3349.7 | 3336.3 |
| 152.5° | 3381.9 | 3360.5 | 3400.7 | 3417.0 | 3398.2 |
| 155°   | 3451.8 | 3427.8 | 3460.0 | 3476.0 | 3454.6 |
| 157.5° | 3508.2 | 3486.8 | 3511.1 | 3529.9 | 3508.2 |
| 160°   | 3556.7 | 3540.4 | 3556.7 | 3572.6 | 3553.8 |
| 162.5° | 3599.4 | 3583.5 | 3596.9 | 3615.7 | 3591.5 |
| 165°   | 3637.1 | 3621.1 | 3629.1 | 3647.9 | 3629.1 |
| 167.5° | 3666.7 | 3650.5 | 3658.8 | 3677.6 | 3653.4 |
| 170°   | 3691.0 | 3674.7 | 3680.1 | 3699.0 | 3674.7 |
| 172.5° | 3706.9 | 3691.0 | 3696.4 | 3715.2 | 3691.0 |
| 175°   | 3720.3 | 3701.5 | 3706.9 | 3725.8 | 3699.0 |
| 177.5° | 3725.8 | 3706.9 | 3709.8 | 3728.6 | 3704.4 |
| 180°   | 3712.4 | 3712.4 | 3712.4 | 3712.4 | 3712.4 |

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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 | 11.59            | 12.41 | 12.59 | 13.42 | 14.76 | 11.14          | 11.96 | 12.14 | 12.97 | 14.31 |
|                 | 3H   | 13.24            | 13.97 | 14.25 | 14.99 | 16.35 | 12.75          | 13.48 | 13.76 | 14.50 | 15.86 |
|                 | 4H   | 13.82            | 14.52 | 14.85 | 15.54 | 16.91 | 13.33          | 14.02 | 14.35 | 15.05 | 16.41 |
|                 | 6H   | 14.22            | 14.86 | 15.25 | 15.88 | 17.26 | 13.72          | 14.36 | 14.75 | 15.38 | 16.76 |
|                 | 8H   | 14.32            | 14.93 | 15.36 | 15.97 | 17.35 | 13.82          | 14.43 | 14.86 | 15.47 | 16.85 |
|                 | 12H  | 14.36            | 14.94 | 15.41 | 15.98 | 17.38 | 13.86          | 14.43 | 14.90 | 15.47 | 16.87 |
| 4H              | 2H   | 12.04            | 12.74 | 13.07 | 13.76 | 15.13 | 11.68          | 12.38 | 12.71 | 13.40 | 14.77 |
|                 | 3H   | 13.90            | 14.48 | 14.93 | 15.53 | 16.91 | 13.49          | 14.07 | 14.53 | 15.12 | 16.50 |
|                 | 4H   | 14.61            | 15.14 | 15.65 | 16.18 | 17.58 | 14.18          | 14.71 | 15.23 | 15.75 | 17.16 |
|                 | 6H   | 15.11            | 15.57 | 16.17 | 16.64 | 18.04 | 14.68          | 15.14 | 15.73 | 16.20 | 17.60 |
|                 | 8H   | 15.26            | 15.69 | 16.31 | 16.74 | 18.16 | 14.82          | 15.25 | 15.88 | 16.31 | 17.72 |
|                 | 12H  | 15.33            | 15.71 | 16.40 | 16.79 | 18.21 | 14.88          | 15.27 | 15.95 | 16.34 | 17.76 |
| 8H              | 4H   | 14.79            | 15.22 | 15.85 | 16.28 | 17.69 | 14.42          | 14.84 | 15.47 | 15.90 | 17.32 |
|                 | 6H   | 15.42            | 15.77 | 16.50 | 16.87 | 18.28 | 15.03          | 15.39 | 16.11 | 16.49 | 17.90 |
|                 | 8H   | 15.63            | 15.94 | 16.72 | 17.03 | 18.46 | 15.24          | 15.55 | 16.33 | 16.63 | 18.07 |
|                 | 12H  | 15.76            | 16.03 | 16.85 | 17.11 | 18.58 | 15.35          | 15.62 | 16.44 | 16.70 | 18.17 |
| 12H             | 4H   | 14.78            | 15.16 | 15.85 | 16.23 | 17.66 | 14.41          | 14.79 | 15.48 | 15.87 | 17.29 |
|                 | 6H   | 15.45            | 15.76 | 16.53 | 16.84 | 18.27 | 15.07          | 15.38 | 16.16 | 16.47 | 17.90 |
|                 | 8H   | 15.68            | 15.95 | 16.77 | 17.03 | 18.50 | 15.30          | 15.57 | 16.39 | 16.65 | 18.12 |