

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: P906837

Luminaire Tested: DFN2DIP-SQ4F0-100D140US835-FLLONL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P906837  
REPORT IS A COMBINATION OF REPORTS P901713 AND P898471  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-SQ4F0-100D140US835-FLLONL  
Description: 4 foot, Square Define Geo, with Direct Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

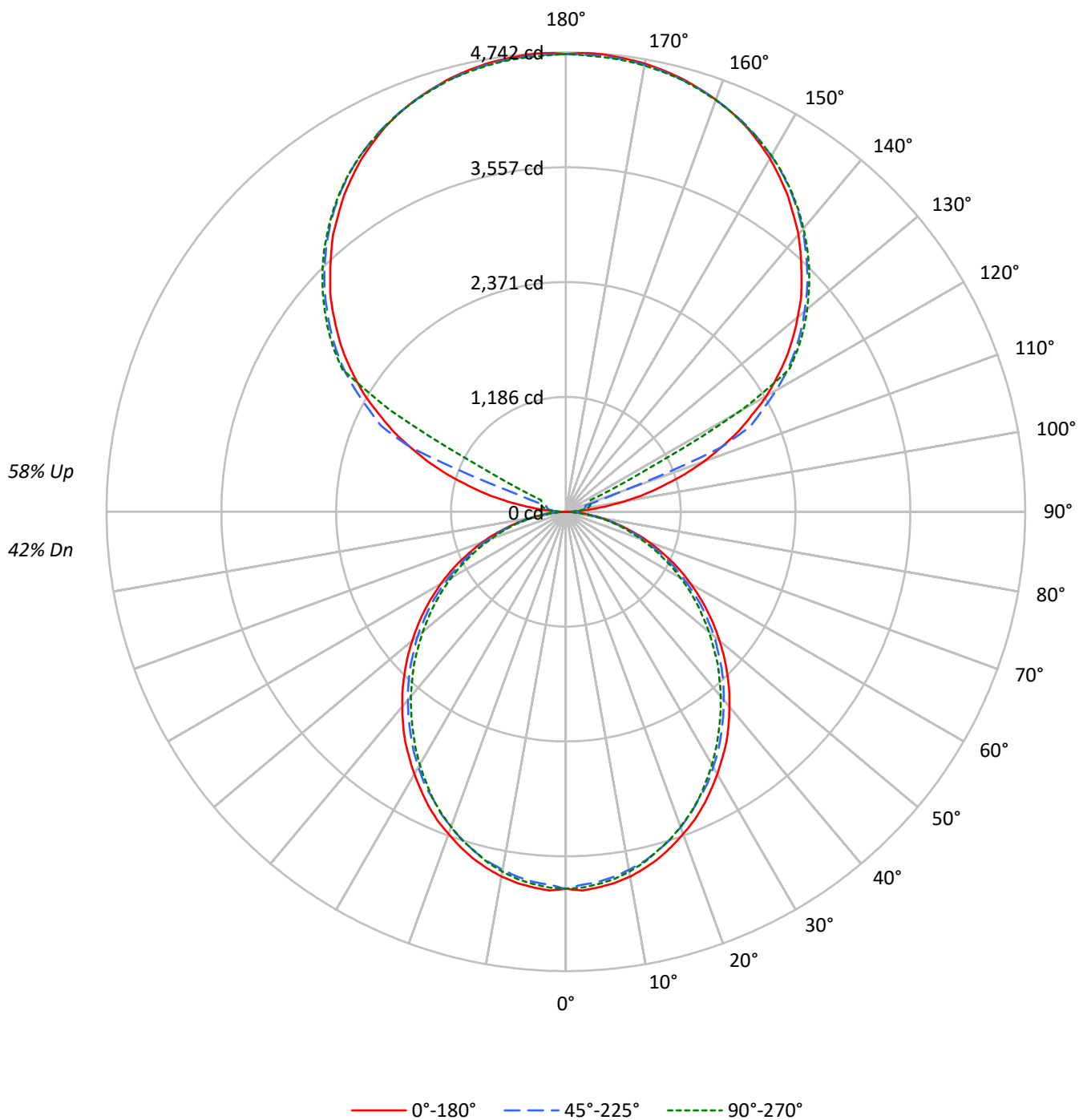
Lumens per Lamp: N/A  
Luminaire Lumens: 23760.0 lumens  
Efficiency: N/A  
Efficacy: 119.7 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 3.92' x L: 3.92' x H: 0.1')  
CIE Type: General Diffuse

Input Watts (W): 198.5  
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   | 105 | 105 | 105 | 105 | 96 | 96 | 96 | 96 | 79 | 79 | 79 | 63 | 63 | 63 | 49 | 49 | 49 |
| 1   | 96  | 92  | 88  | 84  | 87 | 84 | 80 | 78 | 69 | 67 | 65 | 55 | 54 | 52 | 43 | 42 | 41 |
| 2   | 87  | 80  | 74  | 69  | 79 | 73 | 68 | 64 | 60 | 57 | 53 | 49 | 46 | 44 | 38 | 36 | 34 |
| 3   | 80  | 70  | 63  | 57  | 72 | 64 | 58 | 53 | 53 | 49 | 45 | 43 | 40 | 37 | 33 | 31 | 29 |
| 4   | 73  | 62  | 54  | 48  | 66 | 57 | 50 | 45 | 47 | 42 | 38 | 38 | 35 | 32 | 30 | 27 | 25 |
| 5   | 67  | 55  | 47  | 41  | 61 | 51 | 44 | 39 | 42 | 37 | 33 | 34 | 30 | 27 | 27 | 24 | 22 |
| 6   | 62  | 50  | 42  | 36  | 56 | 46 | 39 | 33 | 38 | 33 | 29 | 31 | 27 | 24 | 24 | 22 | 19 |
| 7   | 57  | 45  | 37  | 31  | 52 | 41 | 34 | 29 | 34 | 29 | 25 | 28 | 24 | 21 | 22 | 19 | 17 |
| 8   | 53  | 41  | 33  | 28  | 48 | 37 | 31 | 26 | 31 | 26 | 22 | 26 | 22 | 19 | 20 | 18 | 15 |
| 9   | 49  | 37  | 30  | 25  | 45 | 34 | 28 | 23 | 29 | 24 | 20 | 24 | 20 | 17 | 19 | 16 | 14 |
| 10  | 46  | 34  | 27  | 22  | 42 | 31 | 25 | 21 | 26 | 21 | 18 | 22 | 18 | 15 | 18 | 15 | 13 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 2730 | 2730 | 2730 |
| 5°  | 2735 | 2693 | 2711 |
| 10° | 2712 | 2657 | 2675 |
| 15° | 2672 | 2614 | 2619 |
| 20° | 2618 | 2554 | 2561 |
| 25° | 2565 | 2481 | 2494 |
| 30° | 2498 | 2414 | 2408 |
| 35° | 2434 | 2335 | 2317 |
| 40° | 2356 | 2255 | 2231 |
| 45° | 2277 | 2175 | 2143 |
| 50° | 2192 | 2091 | 2041 |
| 55° | 2102 | 1994 | 1948 |
| 60° | 2001 | 1878 | 1841 |
| 65° | 1891 | 1759 | 1714 |
| 70° | 1750 | 1613 | 1578 |
| 75° | 1555 | 1439 | 1454 |
| 80° | 1321 | 1217 | 1215 |
| 85° | 955  | 833  | 816  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 90°

Vertical Angle: 90°

Luminance: 2534 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 366.2   | 1.5       |
| 10°-20°   | 1030.4  | 4.3       |
| 20°-30°   | 1514.3  | 6.4       |
| 30°-40°   | 1758.8  | 7.4       |
| 40°-50°   | 1756.6  | 7.4       |
| 50°-60°   | 1531.7  | 6.4       |
| 60°-70°   | 1132.3  | 4.8       |
| 70°-80°   | 640.6   | 2.7       |
| 80°-90°   | 177.4   | 0.7       |
| 90°-100°  | 155.8   | 0.7       |
| 100°-110° | 580.8   | 2.4       |
| 110°-120° | 1540.3  | 6.5       |
| 120°-130° | 2554.8  | 10.8      |
| 130°-140° | 2713.8  | 11.4      |
| 140°-150° | 2522.1  | 10.6      |
| 150°-160° | 2027.7  | 8.5       |
| 160°-170° | 1306.6  | 5.5       |
| 170°-180° | 449.7   | 1.9       |
| 0°-30°    | 2911.0  | 12.3      |
| 0°-40°    | 4669.7  | 19.7      |
| 0°-60°    | 7958.0  | 33.5      |
| 0°-90°    | 9908.3  | 41.7      |
| 90°-120°  | 2276.9  | 9.6       |
| 90°-150°  | 10067.6 | 42.4      |
| 90°-180°  | 13852.0 | 58.3      |
| 0°-180°   | 23760.0 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 3891 | 3891  | 3891 | 3891  | 3891 |      |
| 5°   | 3891 | 3876  | 3835 | 3865  | 3858 | 369  |
| 15°  | 3704 | 3682  | 3633 | 3648  | 3630 | 1043 |
| 25°  | 3352 | 3323  | 3259 | 3266  | 3259 | 1543 |
| 35°  | 2892 | 2855  | 2795 | 2772  | 2754 | 1806 |
| 45°  | 2354 | 2327  | 2271 | 2230  | 2215 | 1816 |
| 55°  | 1781 | 1759  | 1714 | 1669  | 1650 | 1592 |
| 65°  | 1201 | 1179  | 1141 | 1108  | 1089 | 1188 |
| 75°  | 628  | 621   | 602  | 580   | 588  | 671  |
| 85°  | 153  | 150   | 146  | 135   | 131  | 171  |
| 90°  | 3    | 41    | 68   | 86    | 92   | 22   |
| 95°  | 222  | 109   | 133  | 151   | 147  | 263  |
| 105° | 1039 | 1142  | 209  | 246   | 260  | 1110 |
| 115° | 1966 | 2024  | 2110 | 527   | 280  | 1935 |
| 125° | 2779 | 2824  | 2889 | 2913  | 2923 | 2479 |
| 135° | 3440 | 3494  | 3525 | 3559  | 3552 | 2657 |
| 145° | 3990 | 3986  | 4044 | 4068  | 4051 | 2495 |
| 155° | 4393 | 4363  | 4404 | 4424  | 4397 | 2024 |
| 165° | 4629 | 4609  | 4619 | 4643  | 4619 | 1308 |
| 175° | 4735 | 4711  | 4718 | 4742  | 4708 | 451  |
| 180° | 4725 | 4725  | 4725 | 4725  | 4725 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 3891.1 | 3891.1 | 3891.1 | 3891.1 | 3891.1 |
| 2.5°   | 3913.7 | 3895.0 | 3853.7 | 3891.1 | 3883.9 |
| 5°     | 3891.1 | 3876.4 | 3835.1 | 3864.9 | 3857.7 |
| 7.5°   | 3864.9 | 3842.6 | 3801.3 | 3831.5 | 3824.0 |
| 10°    | 3824.0 | 3797.8 | 3752.9 | 3782.7 | 3771.6 |
| 12.5°  | 3767.6 | 3745.4 | 3700.5 | 3719.2 | 3711.6 |
| 15°    | 3704.1 | 3681.9 | 3633.0 | 3648.1 | 3629.5 |
| 17.5°  | 3625.5 | 3603.3 | 3554.4 | 3573.1 | 3554.4 |
| 20°    | 3539.3 | 3517.1 | 3464.7 | 3475.8 | 3461.1 |
| 22.5°  | 3453.6 | 3419.9 | 3371.0 | 3371.0 | 3363.5 |
| 25°    | 3352.4 | 3322.6 | 3259.1 | 3266.2 | 3259.1 |
| 27.5°  | 3240.0 | 3213.8 | 3165.4 | 3154.3 | 3135.6 |
| 30°    | 3128.1 | 3097.9 | 3041.9 | 3030.8 | 3015.7 |
| 32.5°  | 3008.2 | 2986.0 | 2926.0 | 2903.4 | 2888.3 |
| 35°    | 2892.3 | 2855.0 | 2795.0 | 2772.4 | 2753.7 |
| 37.5°  | 2761.3 | 2727.5 | 2667.6 | 2641.4 | 2622.7 |
| 40°    | 2626.7 | 2596.5 | 2536.6 | 2503.3 | 2488.2 |
| 42.5°  | 2495.7 | 2465.5 | 2406.0 | 2368.3 | 2346.1 |
| 45°    | 2353.6 | 2327.4 | 2271.0 | 2230.1 | 2215.1 |
| 47.5°  | 2215.1 | 2188.9 | 2128.9 | 2087.6 | 2065.4 |
| 50°    | 2069.0 | 2050.3 | 1997.9 | 1945.5 | 1926.9 |
| 52.5°  | 1926.9 | 1900.7 | 1852.2 | 1811.0 | 1784.8 |
| 55°    | 1781.2 | 1758.6 | 1713.7 | 1668.8 | 1650.2 |
| 57.5°  | 1635.1 | 1616.4 | 1567.6 | 1522.8 | 1507.7 |
| 60°    | 1489.0 | 1474.3 | 1421.9 | 1380.6 | 1369.5 |
| 62.5°  | 1346.9 | 1320.7 | 1283.4 | 1246.1 | 1231.0 |
| 65°    | 1201.2 | 1178.6 | 1141.3 | 1107.5 | 1088.9 |
| 67.5°  | 1051.6 | 1032.5 | 999.2  | 973.0  | 957.9  |
| 70°    | 913.0  | 897.9  | 864.2  | 838.0  | 823.3  |
| 72.5°  | 770.9  | 755.8  | 737.2  | 711.0  | 699.8  |
| 75°    | 628.4  | 621.3  | 602.2  | 580.0  | 587.5  |
| 77.5°  | 501.4  | 486.3  | 478.7  | 467.6  | 456.5  |
| 80°    | 374.3  | 370.4  | 362.8  | 351.7  | 344.2  |
| 82.5°  | 254.5  | 254.5  | 250.9  | 235.8  | 235.8  |
| 85°    | 153.2  | 149.7  | 146.1  | 134.6  | 131.0  |
| 87.5°  | 67.5   | 59.9   | 52.4   | 41.3   | 37.3   |
| 90°    | 3.2    | 41.0   | 68.2   | 85.7   | 92.2   |
| 92.5°  | 85.7   | 71.9   | 82.0   | 88.9   | 92.2   |
| 95°    | 222.1  | 109.2  | 133.2  | 150.6  | 147.0  |
| 97.5°  | 399.9  | 119.8  | 174.2  | 184.7  | 188.0  |
| 100°   | 605.3  | 136.8  | 194.9  | 222.1  | 229.0  |
| 102.5° | 830.6  | 824.1  | 201.8  | 239.1  | 249.7  |
| 105°   | 1039.3 | 1142.0 | 208.7  | 246.0  | 259.8  |
| 107.5° | 1282.1 | 1367.3 | 215.6  | 252.9  | 266.7  |
| 110°   | 1514.7 | 1586.2 | 598.4  | 256.6  | 270.0  |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 1733.5 | 1794.8 | 1736.8 | 263.1  | 273.6  |
| 115°   | 1965.8 | 2023.8 | 2109.5 | 526.6  | 280.5  |
| 117.5° | 2167.5 | 2235.7 | 2294.2 | 1805.0 | 909.4  |
| 120°   | 2393.3 | 2444.4 | 2506.1 | 2547.1 | 2085.5 |
| 122.5° | 2584.5 | 2639.3 | 2707.9 | 2728.2 | 2731.9 |
| 125°   | 2779.4 | 2824.0 | 2889.0 | 2912.9 | 2923.1 |
| 127.5° | 2957.2 | 3005.1 | 3056.6 | 3090.7 | 3094.0 |
| 130°   | 3124.8 | 3179.7 | 3217.0 | 3254.8 | 3251.5 |
| 132.5° | 3295.8 | 3340.4 | 3377.8 | 3408.6 | 3405.4 |
| 135°   | 3439.5 | 3494.3 | 3524.7 | 3559.2 | 3552.3 |
| 137.5° | 3589.7 | 3630.7 | 3665.2 | 3699.3 | 3689.2 |
| 140°   | 3736.7 | 3764.3 | 3801.6 | 3832.5 | 3815.4 |
| 142.5° | 3860.1 | 3884.0 | 3928.3 | 3955.5 | 3938.4 |
| 145°   | 3990.0 | 3986.3 | 4044.4 | 4068.4 | 4051.3 |
| 147.5° | 4102.5 | 4092.3 | 4150.4 | 4167.4 | 4154.0 |
| 150°   | 4212.1 | 4188.1 | 4242.9 | 4263.2 | 4246.2 |
| 152.5° | 4304.2 | 4277.0 | 4328.2 | 4348.9 | 4324.9 |
| 155°   | 4393.1 | 4362.7 | 4403.7 | 4424.0 | 4396.8 |
| 157.5° | 4465.0 | 4437.8 | 4468.7 | 4492.6 | 4465.0 |
| 160°   | 4526.7 | 4506.0 | 4526.7 | 4547.0 | 4523.1 |
| 162.5° | 4581.1 | 4560.8 | 4577.9 | 4601.8 | 4571.0 |
| 165°   | 4629.0 | 4608.7 | 4618.9 | 4642.8 | 4618.9 |
| 167.5° | 4666.8 | 4646.1 | 4656.6 | 4680.6 | 4649.7 |
| 170°   | 4697.6 | 4676.9 | 4683.8 | 4707.8 | 4676.9 |
| 172.5° | 4717.9 | 4697.6 | 4704.5 | 4728.5 | 4697.6 |
| 175°   | 4735.0 | 4711.0 | 4717.9 | 4741.9 | 4707.8 |
| 177.5° | 4741.9 | 4717.9 | 4721.6 | 4745.5 | 4714.7 |
| 180°   | 4724.8 | 4724.8 | 4724.8 | 4724.8 | 4724.8 |

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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 | 9.96             | 10.75 | 10.98 | 11.78 | 13.16 | 9.51           | 10.30 | 10.54 | 11.34 | 12.72 |
|                 | 3H   | 11.61            | 12.32 | 12.65 | 13.37 | 14.77 | 11.12          | 11.83 | 12.16 | 12.88 | 14.28 |
|                 | 4H   | 12.20            | 12.87 | 13.25 | 13.92 | 15.33 | 11.71          | 12.38 | 12.76 | 13.42 | 14.84 |
|                 | 6H   | 12.60            | 13.22 | 13.66 | 14.27 | 15.69 | 12.10          | 12.72 | 13.16 | 13.77 | 15.19 |
|                 | 8H   | 12.71            | 13.30 | 13.77 | 14.36 | 15.78 | 12.20          | 12.79 | 13.27 | 13.86 | 15.28 |
|                 | 12H  | 12.75            | 13.31 | 13.82 | 14.37 | 15.82 | 12.24          | 12.80 | 13.31 | 13.86 | 15.31 |
| 4H              | 2H   | 10.41            | 11.08 | 11.46 | 12.12 | 13.54 | 10.05          | 10.73 | 11.11 | 11.77 | 13.18 |
|                 | 3H   | 12.27            | 12.83 | 13.33 | 13.91 | 15.33 | 11.87          | 12.43 | 12.93 | 13.50 | 14.92 |
|                 | 4H   | 12.99            | 13.50 | 14.06 | 14.56 | 16.01 | 12.56          | 13.08 | 13.63 | 14.14 | 15.59 |
|                 | 6H   | 13.50            | 13.94 | 14.58 | 15.03 | 16.47 | 13.07          | 13.51 | 14.15 | 14.60 | 16.04 |
|                 | 8H   | 13.65            | 14.07 | 14.73 | 15.14 | 16.60 | 13.22          | 13.63 | 14.29 | 14.71 | 16.16 |
|                 | 12H  | 13.72            | 14.10 | 14.82 | 15.19 | 16.65 | 13.28          | 13.65 | 14.37 | 14.74 | 16.20 |
| 8H              | 4H   | 13.18            | 13.59 | 14.26 | 14.67 | 16.13 | 12.80          | 13.21 | 13.88 | 14.29 | 15.75 |
|                 | 6H   | 13.81            | 14.15 | 14.91 | 15.27 | 16.73 | 13.43          | 13.77 | 14.53 | 14.89 | 16.34 |
|                 | 8H   | 14.03            | 14.33 | 15.14 | 15.44 | 16.91 | 13.64          | 13.94 | 14.75 | 15.04 | 16.52 |
|                 | 12H  | 14.17            | 14.43 | 15.28 | 15.53 | 17.04 | 13.76          | 14.02 | 14.87 | 15.12 | 16.63 |
| 12H             | 4H   | 13.16            | 13.53 | 14.26 | 14.63 | 16.09 | 12.79          | 13.17 | 13.89 | 14.26 | 15.72 |
|                 | 6H   | 13.84            | 14.14 | 14.95 | 15.24 | 16.72 | 13.47          | 13.77 | 14.58 | 14.87 | 16.35 |
|                 | 8H   | 14.08            | 14.35 | 15.19 | 15.45 | 16.96 | 13.70          | 13.97 | 14.81 | 15.07 | 16.58 |