

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: P920231

Luminaire Tested: DFN2DIP-SQ3F0-100D120US935-RLLONL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P920231  
REPORT IS A COMBINATION OF REPORTS P901538 AND P898289  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-SQ3F0-100D120US935-RLLONL  
Description: 3 foot, Square Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

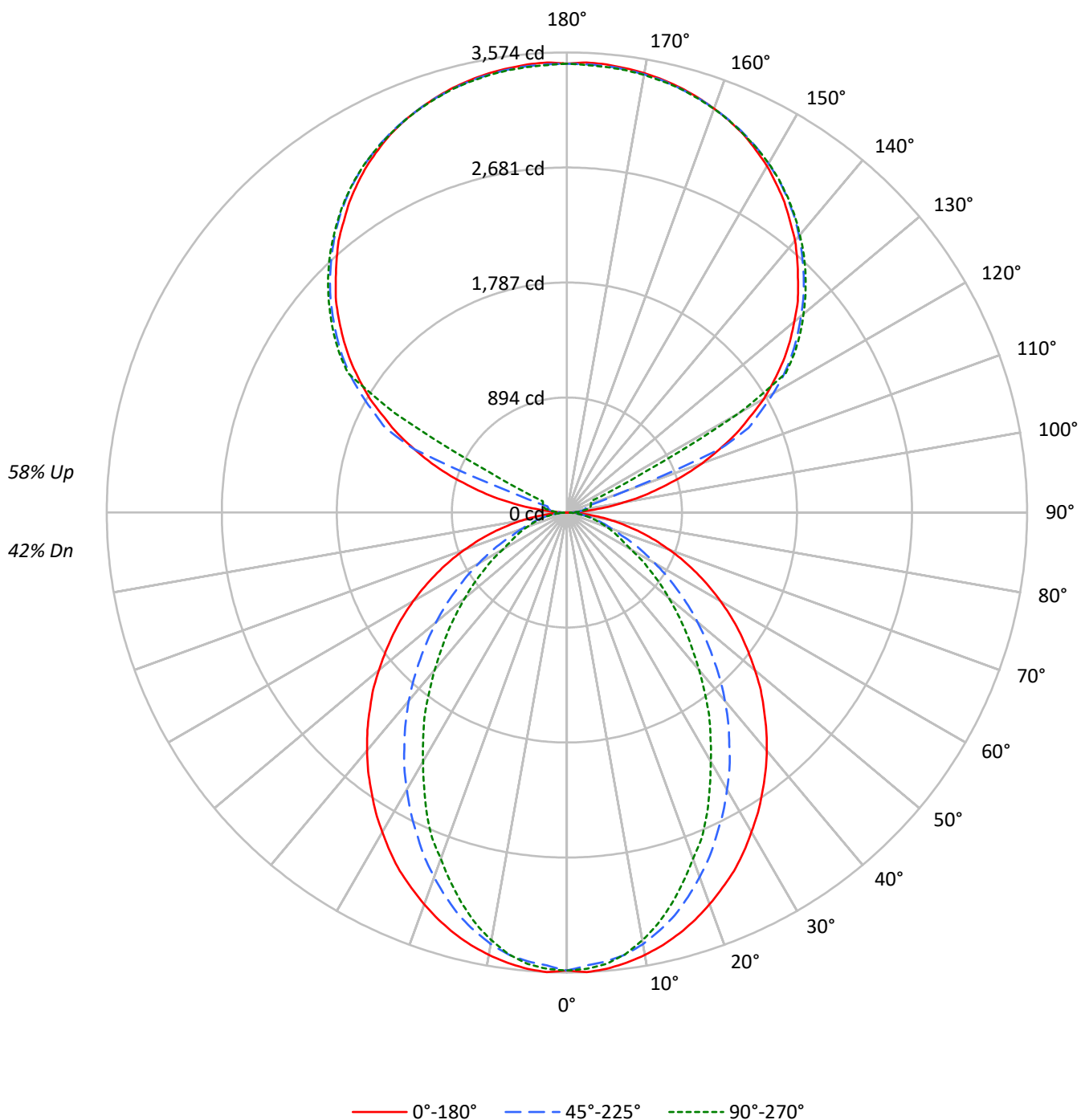
Lumens per Lamp: N/A  
Luminaire Lumens: 17547.1 lumens  
Efficiency: N/A  
Efficacy: 91.1 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 0.99 / 1.16  
Luminous Opening: Rectangular w/ Sides (W: 3.06' x L: 3.06' x H: 0.1')  
CIE Type: General Diffuse

Input Watts (W): 192.6  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9781  
Total Harmonic Distortion (THDi): 0.075  
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  | 89  | 85  | 88 | 84 | 81 | 78 | 70 | 67 | 65 | 56 | 55 | 53 | 43 | 43 | 42 |
| 2   | 88  | 81  | 75  | 70  | 80 | 74 | 69 | 65 | 61 | 58 | 55 | 50 | 47 | 45 | 39 | 37 | 36 |
| 3   | 81  | 72  | 65  | 59  | 73 | 66 | 60 | 55 | 55 | 50 | 46 | 44 | 41 | 39 | 35 | 33 | 31 |
| 4   | 74  | 64  | 56  | 50  | 67 | 58 | 52 | 47 | 49 | 44 | 40 | 40 | 36 | 33 | 31 | 29 | 27 |
| 5   | 68  | 57  | 49  | 43  | 62 | 52 | 45 | 40 | 44 | 39 | 35 | 36 | 32 | 29 | 28 | 26 | 24 |
| 6   | 63  | 51  | 43  | 38  | 57 | 47 | 40 | 35 | 39 | 34 | 30 | 32 | 29 | 26 | 26 | 23 | 21 |
| 7   | 58  | 46  | 38  | 33  | 53 | 43 | 36 | 31 | 36 | 31 | 27 | 30 | 26 | 23 | 24 | 21 | 19 |
| 8   | 54  | 42  | 34  | 29  | 49 | 39 | 32 | 27 | 33 | 28 | 24 | 27 | 23 | 20 | 22 | 19 | 17 |
| 9   | 50  | 38  | 31  | 26  | 46 | 35 | 29 | 25 | 30 | 25 | 22 | 25 | 21 | 18 | 20 | 17 | 15 |
| 10  | 47  | 35  | 28  | 23  | 43 | 33 | 26 | 22 | 28 | 23 | 19 | 23 | 19 | 17 | 19 | 16 | 14 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 4077 | 4077 | 4077 |
| 5°  | 4081 | 4010 | 4037 |
| 10° | 4038 | 3929 | 3904 |
| 15° | 3980 | 3796 | 3700 |
| 20° | 3904 | 3615 | 3450 |
| 25° | 3826 | 3412 | 3208 |
| 30° | 3722 | 3204 | 2902 |
| 35° | 3620 | 2981 | 2633 |
| 40° | 3516 | 2750 | 2325 |
| 45° | 3396 | 2494 | 2047 |
| 50° | 3271 | 2236 | 1774 |
| 55° | 3141 | 1961 | 1512 |
| 60° | 2990 | 1674 | 1244 |
| 65° | 2815 | 1382 | 1118 |
| 70° | 2604 | 1110 | 1010 |
| 75° | 2338 | 973  | 916  |
| 80° | 1954 | 808  | 790  |
| 85° | 1325 | 526  | 585  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 3396 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 333.5   | 1.9       |
| 10°-20°   | 915.5   | 5.2       |
| 20°-30°   | 1285.4  | 7.3       |
| 30°-40°   | 1401.2  | 8.0       |
| 40°-50°   | 1287.8  | 7.3       |
| 50°-60°   | 1011.4  | 5.8       |
| 60°-70°   | 658.3   | 3.8       |
| 70°-80°   | 338.9   | 1.9       |
| 80°-90°   | 92.7    | 0.5       |
| 90°-100°  | 115.0   | 0.7       |
| 100°-110° | 428.6   | 2.4       |
| 110°-120° | 1136.8  | 6.5       |
| 120°-130° | 1885.4  | 10.7      |
| 130°-140° | 2002.8  | 11.4      |
| 140°-150° | 1861.3  | 10.6      |
| 150°-160° | 1496.5  | 8.5       |
| 160°-170° | 964.3   | 5.5       |
| 170°-180° | 331.9   | 1.9       |
| 0°-30°    | 2534.4  | 14.4      |
| 0°-40°    | 3935.6  | 22.4      |
| 0°-60°    | 6234.8  | 35.5      |
| 0°-90°    | 7324.6  | 41.7      |
| 90°-120°  | 1680.4  | 9.6       |
| 90°-150°  | 7429.9  | 42.3      |
| 90°-180°  | 10223.0 | 58.3      |
| 0°-180°   | 17547.1 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 3558 | 3558  | 3558 | 3558  | 3558 |      |
| 5°   | 3558 | 3542  | 3500 | 3530  | 3520 | 337  |
| 15°  | 3385 | 3349  | 3240 | 3178  | 3146 | 954  |
| 25°  | 3072 | 2969  | 2757 | 2625  | 2576 | 1413 |
| 35°  | 2647 | 2483  | 2200 | 1997  | 1926 | 1657 |
| 45°  | 2164 | 1948  | 1610 | 1381  | 1304 | 1671 |
| 55°  | 1646 | 1394  | 1046 | 854   | 792  | 1470 |
| 65°  | 1111 | 850   | 560  | 451   | 441  | 1102 |
| 75°  | 592  | 367   | 258  | 235   | 232  | 627  |
| 85°  | 138  | 71    | 61   | 61    | 61   | 159  |
| 90°  | 2    | 30    | 50   | 63    | 68   | 16   |
| 95°  | 164  | 81    | 98   | 111   | 108  | 194  |
| 105° | 767  | 843   | 154  | 182   | 192  | 820  |
| 115° | 1451 | 1494  | 1557 | 389   | 207  | 1428 |
| 125° | 2051 | 2084  | 2132 | 2150  | 2157 | 1829 |
| 135° | 2538 | 2579  | 2601 | 2627  | 2622 | 1961 |
| 145° | 2945 | 2942  | 2985 | 3002  | 2990 | 1842 |
| 155° | 3242 | 3220  | 3250 | 3265  | 3245 | 1494 |
| 165° | 3416 | 3401  | 3409 | 3426  | 3409 | 965  |
| 175° | 3494 | 3477  | 3482 | 3500  | 3474 | 333  |
| 180° | 3487 | 3487  | 3487 | 3487  | 3487 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 3558.5 | 3558.5 | 3558.5 | 3558.5 | 3558.5 |
| 2.5°   | 3574.5 | 3558.5 | 3522.9 | 3555.4 | 3548.9 |
| 5°     | 3558.5 | 3542.4 | 3500.4 | 3529.5 | 3519.8 |
| 7.5°   | 3529.5 | 3510.3 | 3465.2 | 3477.8 | 3461.8 |
| 10°    | 3490.8 | 3468.3 | 3404.0 | 3394.1 | 3375.0 |
| 12.5°  | 3442.7 | 3413.6 | 3326.5 | 3307.4 | 3271.8 |
| 15°    | 3384.6 | 3349.0 | 3239.7 | 3178.5 | 3146.4 |
| 17.5°  | 3316.9 | 3265.3 | 3130.1 | 3059.3 | 3007.7 |
| 20°    | 3239.7 | 3175.1 | 3014.2 | 2933.9 | 2862.8 |
| 22.5°  | 3156.0 | 3081.9 | 2894.9 | 2785.7 | 2737.5 |
| 25°    | 3072.3 | 2969.2 | 2756.6 | 2624.7 | 2576.2 |
| 27.5°  | 2972.5 | 2862.8 | 2627.8 | 2476.4 | 2402.3 |
| 30°    | 2866.3 | 2743.6 | 2486.0 | 2322.0 | 2234.9 |
| 32.5°  | 2763.1 | 2614.8 | 2351.0 | 2157.7 | 2077.0 |
| 35°    | 2647.2 | 2482.9 | 2199.7 | 1996.7 | 1925.6 |
| 37.5°  | 2534.5 | 2357.2 | 2057.9 | 1835.5 | 1755.1 |
| 40°    | 2415.3 | 2222.2 | 1909.6 | 1681.0 | 1597.3 |
| 42.5°  | 2292.9 | 2086.9 | 1761.7 | 1523.2 | 1442.9 |
| 45°    | 2164.1 | 1948.2 | 1610.3 | 1381.4 | 1304.2 |
| 47.5°  | 2041.9 | 1813.3 | 1465.4 | 1236.5 | 1165.8 |
| 50°    | 1906.5 | 1677.9 | 1323.6 | 1101.2 | 1033.9 |
| 52.5°  | 1774.3 | 1532.7 | 1188.3 | 975.8  | 914.6  |
| 55°    | 1645.5 | 1394.4 | 1046.5 | 853.5  | 792.3  |
| 57.5°  | 1513.6 | 1255.9 | 921.2  | 740.7  | 689.1  |
| 60°    | 1378.3 | 1120.7 | 788.9  | 624.9  | 573.3  |
| 62.5°  | 1246.4 | 988.8  | 676.1  | 521.8  | 496.1  |
| 65°    | 1111.1 | 850.1  | 560.3  | 451.0  | 441.1  |
| 67.5°  | 982.3  | 721.3  | 451.0  | 396.0  | 386.4  |
| 70°    | 847.0  | 595.9  | 373.4  | 341.3  | 328.4  |
| 72.5°  | 718.2  | 479.7  | 312.3  | 286.6  | 280.2  |
| 75°    | 592.5  | 367.0  | 257.6  | 235.1  | 232.0  |
| 77.5°  | 467.1  | 260.7  | 202.9  | 189.9  | 183.5  |
| 80°    | 350.9  | 186.9  | 154.5  | 141.8  | 141.8  |
| 82.5°  | 244.6  | 125.7  | 106.2  | 99.8   | 99.8   |
| 85°    | 138.4  | 70.7   | 61.1   | 61.1   | 61.1   |
| 87.5°  | 51.6   | 25.7   | 25.7   | 22.6   | 22.6   |
| 90°    | 2.4    | 30.2   | 50.4   | 63.2   | 68.0   |
| 92.5°  | 63.2   | 53.0   | 60.5   | 65.6   | 68.0   |
| 95°    | 163.8  | 80.6   | 98.2   | 111.2  | 108.5  |
| 97.5°  | 295.2  | 88.4   | 128.5  | 136.3  | 138.7  |
| 100°   | 446.7  | 101.0  | 143.8  | 163.8  | 169.0  |
| 102.5° | 613.0  | 608.2  | 148.9  | 176.5  | 184.3  |
| 105°   | 767.0  | 842.8  | 154.0  | 181.6  | 191.7  |
| 107.5° | 946.2  | 1009.1 | 159.1  | 186.7  | 196.8  |
| 110°   | 1117.8 | 1170.6 | 441.6  | 189.3  | 199.2  |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 1279.4 | 1324.6 | 1281.8 | 194.2  | 201.9  |
| 115°   | 1450.7 | 1493.6 | 1556.8 | 388.6  | 207.1  |
| 117.5° | 1599.6 | 1650.0 | 1693.2 | 1332.0 | 671.1  |
| 120°   | 1766.3 | 1804.0 | 1849.5 | 1879.8 | 1539.1 |
| 122.5° | 1907.4 | 1947.8 | 1998.5 | 2013.4 | 2016.1 |
| 125°   | 2051.2 | 2084.1 | 2132.1 | 2149.7 | 2157.2 |
| 127.5° | 2182.4 | 2217.8 | 2255.8 | 2281.0 | 2283.4 |
| 130°   | 2306.1 | 2346.6 | 2374.1 | 2402.0 | 2399.6 |
| 132.5° | 2432.2 | 2465.2 | 2492.8 | 2515.6 | 2513.2 |
| 135°   | 2538.3 | 2578.8 | 2601.2 | 2626.7 | 2621.7 |
| 137.5° | 2649.2 | 2679.4 | 2704.9 | 2730.1 | 2722.6 |
| 140°   | 2757.7 | 2778.0 | 2805.6 | 2828.4 | 2815.8 |
| 142.5° | 2848.7 | 2866.4 | 2899.1 | 2919.1 | 2906.6 |
| 145°   | 2944.6 | 2941.9 | 2984.7 | 3002.5 | 2989.8 |
| 147.5° | 3027.6 | 3020.1 | 3063.0 | 3075.6 | 3065.7 |
| 150°   | 3108.5 | 3090.8 | 3131.3 | 3146.3 | 3133.7 |
| 152.5° | 3176.5 | 3156.4 | 3194.2 | 3209.5 | 3191.8 |
| 155°   | 3242.1 | 3219.6 | 3249.9 | 3264.9 | 3244.8 |
| 157.5° | 3295.1 | 3275.1 | 3297.9 | 3315.5 | 3295.1 |
| 160°   | 3340.7 | 3325.4 | 3340.7 | 3355.7 | 3338.0 |
| 162.5° | 3380.9 | 3365.9 | 3378.5 | 3396.1 | 3373.4 |
| 165°   | 3416.2 | 3401.2 | 3408.7 | 3426.4 | 3408.7 |
| 167.5° | 3444.1 | 3428.8 | 3436.6 | 3454.2 | 3431.5 |
| 170°   | 3466.8 | 3451.6 | 3456.6 | 3474.3 | 3451.6 |
| 172.5° | 3481.8 | 3466.8 | 3472.0 | 3489.6 | 3466.8 |
| 175°   | 3494.4 | 3476.7 | 3481.8 | 3499.5 | 3474.3 |
| 177.5° | 3499.5 | 3481.8 | 3484.5 | 3502.2 | 3479.5 |
| 180°   | 3487.0 | 3487.0 | 3487.0 | 3487.0 | 3487.0 |

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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 | 11.17            | 11.94 | 12.20 | 12.97 | 14.36 | 7.13           | 7.90  | 8.16  | 8.93  | 10.32 |
|                 | 3H   | 12.84            | 13.53 | 13.88 | 14.57 | 15.98 | 8.31           | 9.00  | 9.35  | 10.04 | 11.45 |
|                 | 4H   | 13.44            | 14.09 | 14.50 | 15.14 | 16.55 | 8.75           | 9.40  | 9.81  | 10.45 | 11.86 |
|                 | 6H   | 13.86            | 14.46 | 14.92 | 15.51 | 16.93 | 9.07           | 9.66  | 10.13 | 10.71 | 12.14 |
|                 | 8H   | 13.98            | 14.55 | 15.05 | 15.61 | 17.04 | 9.15           | 9.72  | 10.22 | 10.79 | 12.21 |
|                 | 12H  | 14.04            | 14.58 | 15.11 | 15.64 | 17.08 | 9.19           | 9.73  | 10.26 | 10.79 | 12.23 |
| 4H              | 2H   | 11.18            | 11.83 | 12.24 | 12.88 | 14.29 | 7.72           | 8.37  | 8.78  | 9.41  | 10.83 |
|                 | 3H   | 13.00            | 13.54 | 14.07 | 14.61 | 16.04 | 9.06           | 9.60  | 10.12 | 10.67 | 12.10 |
|                 | 4H   | 13.69            | 14.18 | 14.76 | 15.24 | 16.69 | 9.60           | 10.09 | 10.67 | 11.15 | 12.60 |
|                 | 6H   | 14.19            | 14.62 | 15.28 | 15.70 | 17.15 | 10.01          | 10.43 | 11.09 | 11.52 | 12.96 |
|                 | 8H   | 14.36            | 14.76 | 15.45 | 15.84 | 17.30 | 10.13          | 10.52 | 11.21 | 11.60 | 13.06 |
|                 | 12H  | 14.45            | 14.81 | 15.55 | 15.90 | 17.37 | 10.19          | 10.55 | 11.29 | 11.64 | 13.10 |
| 8H              | 4H   | 13.65            | 14.04 | 14.73 | 15.12 | 16.58 | 9.87           | 10.26 | 10.95 | 11.34 | 12.80 |
|                 | 6H   | 14.21            | 14.53 | 15.31 | 15.65 | 17.11 | 10.38          | 10.70 | 11.48 | 11.82 | 13.28 |
|                 | 8H   | 14.42            | 14.71 | 15.53 | 15.81 | 17.28 | 10.56          | 10.85 | 11.67 | 11.95 | 13.43 |
|                 | 12H  | 14.55            | 14.80 | 15.67 | 15.90 | 17.42 | 10.67          | 10.92 | 11.79 | 12.02 | 13.54 |
| 12H             | 4H   | 13.60            | 13.95 | 14.70 | 15.05 | 16.51 | 9.87           | 10.23 | 10.97 | 11.32 | 12.78 |
|                 | 6H   | 14.18            | 14.47 | 15.29 | 15.57 | 17.05 | 10.42          | 10.71 | 11.53 | 11.81 | 13.29 |
|                 | 8H   | 14.39            | 14.65 | 15.51 | 15.75 | 17.26 | 10.63          | 10.88 | 11.74 | 11.98 | 13.49 |