

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: P906942

Luminaire Tested: DFN2DIP-SQ4F0-140D120US835-RLLFLL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P906942  
REPORT IS A COMBINATION OF REPORTS P900182 AND P896915  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-SQ4F0-140D120US835-RLLFLL  
Description: 4 foot, Square Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

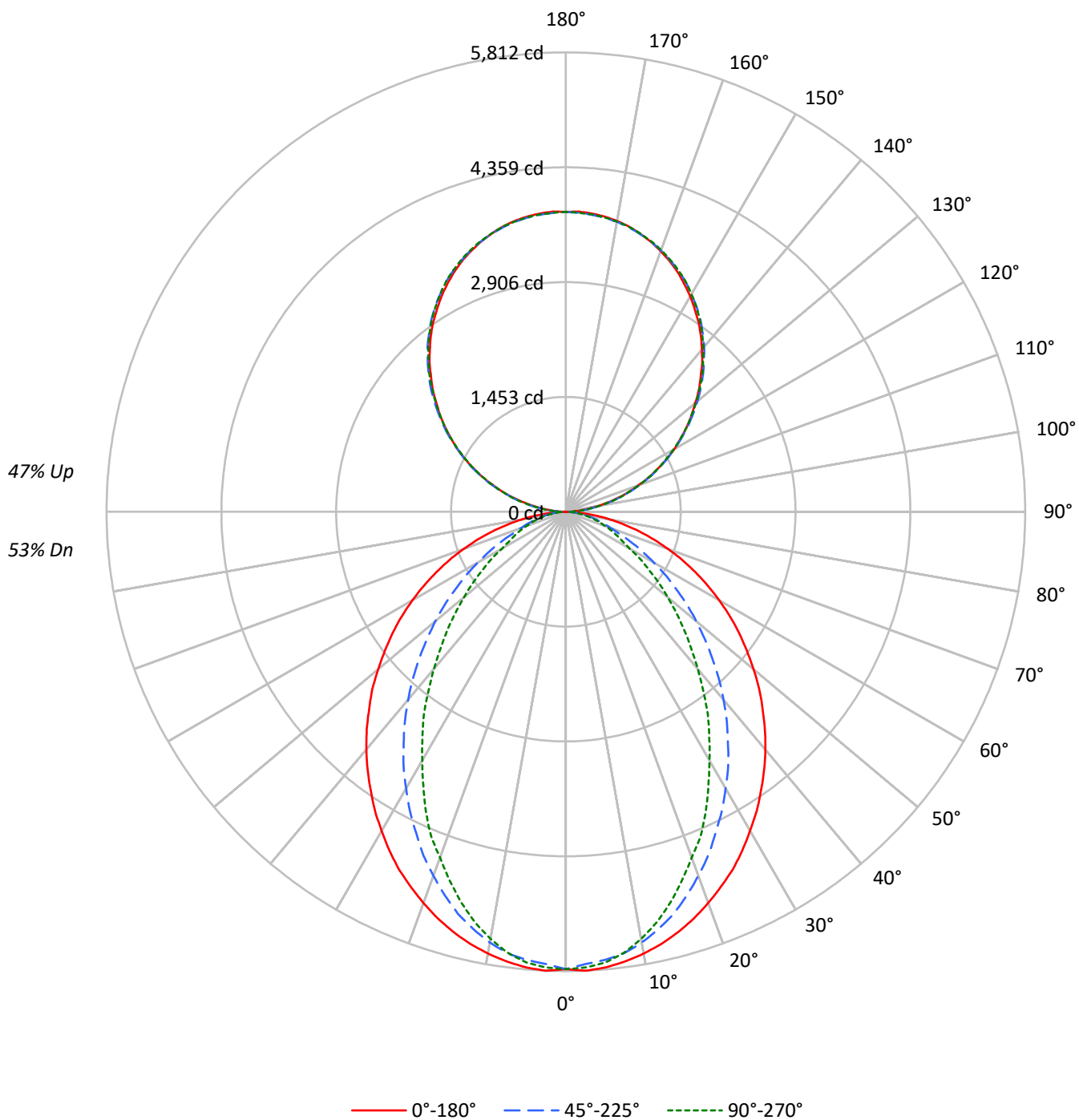
Lumens per Lamp: N/A  
Luminaire Lumens: 22520.0 lumens  
Efficiency: N/A  
Efficacy: 96.3 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 0.99 / 1.16  
Luminous Opening: Rectangular w/ Sides (W: 3.92' x L: 3.92' x H: 0.1')  
CIE Type: General Diffuse

Input Watts (W): 233.9  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9789  
Total Harmonic Distortion (THDi): 0.074  
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



TEST NUMBER: P906942

CATALOG NUMBER: DFN2DIP-SQ4F0-140D120US835-RLFL

**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 | 100 | 100 | 100 | 100 | 85 | 85 | 85 | 71 | 71 | 71 | 59 | 59 | 59 |
| 1   | 99  | 95  | 91  | 88  | 92  | 88  | 85  | 82  | 75 | 73 | 71 | 64 | 62 | 60 | 53 | 52 | 51 |
| 2   | 91  | 83  | 77  | 72  | 84  | 78  | 72  | 68  | 67 | 63 | 59 | 56 | 54 | 51 | 47 | 45 | 43 |
| 3   | 83  | 74  | 67  | 61  | 77  | 69  | 62  | 57  | 59 | 54 | 51 | 50 | 47 | 44 | 42 | 40 | 38 |
| 4   | 76  | 66  | 58  | 52  | 70  | 61  | 54  | 49  | 53 | 48 | 44 | 45 | 41 | 38 | 38 | 35 | 33 |
| 5   | 70  | 59  | 51  | 45  | 65  | 55  | 48  | 43  | 48 | 42 | 38 | 41 | 37 | 33 | 34 | 31 | 29 |
| 6   | 65  | 53  | 45  | 39  | 60  | 50  | 42  | 37  | 43 | 38 | 33 | 37 | 33 | 30 | 31 | 28 | 26 |
| 7   | 60  | 48  | 40  | 35  | 56  | 45  | 38  | 33  | 39 | 34 | 30 | 34 | 30 | 26 | 29 | 26 | 23 |
| 8   | 56  | 44  | 36  | 31  | 52  | 41  | 34  | 29  | 36 | 30 | 27 | 31 | 27 | 24 | 27 | 23 | 21 |
| 9   | 52  | 40  | 33  | 28  | 48  | 38  | 31  | 26  | 33 | 28 | 24 | 29 | 24 | 21 | 25 | 21 | 19 |
| 10  | 49  | 37  | 30  | 25  | 45  | 35  | 28  | 24  | 31 | 25 | 22 | 27 | 22 | 19 | 23 | 20 | 17 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 4060 | 4060 | 4060 |
| 5°  | 4066 | 3996 | 4022 |
| 10° | 4026 | 3919 | 3893 |
| 15° | 3971 | 3790 | 3691 |
| 20° | 3897 | 3612 | 3444 |
| 25° | 3822 | 3413 | 3205 |
| 30° | 3721 | 3208 | 2902 |
| 35° | 3622 | 2988 | 2635 |
| 40° | 3522 | 2760 | 2329 |
| 45° | 3405 | 2508 | 2052 |
| 50° | 3284 | 2252 | 1781 |
| 55° | 3158 | 1980 | 1521 |
| 60° | 3012 | 1694 | 1253 |
| 65° | 2844 | 1404 | 1129 |
| 70° | 2640 | 1133 | 1024 |
| 75° | 2384 | 1001 | 934  |
| 80° | 2014 | 842  | 814  |
| 85° | 1402 | 566  | 619  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 3405 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 542.3   | 2.4       |
| 10°-20°   | 1488.7  | 6.6       |
| 20°-30°   | 2090.1  | 9.3       |
| 30°-40°   | 2278.3  | 10.1      |
| 40°-50°   | 2094.0  | 9.3       |
| 50°-60°   | 1644.5  | 7.3       |
| 60°-70°   | 1070.4  | 4.8       |
| 70°-80°   | 551.0   | 2.4       |
| 80°-90°   | 151.5   | 0.7       |
| 90°-100°  | 234.8   | 1.0       |
| 100°-110° | 746.2   | 3.3       |
| 110°-120° | 1276.9  | 5.7       |
| 120°-130° | 1679.4  | 7.5       |
| 130°-140° | 1885.0  | 8.4       |
| 140°-150° | 1848.5  | 8.2       |
| 150°-160° | 1550.6  | 6.9       |
| 160°-170° | 1028.3  | 4.6       |
| 170°-180° | 359.4   | 1.6       |
| 0°-30°    | 4121.0  | 18.3      |
| 0°-40°    | 6399.4  | 28.4      |
| 0°-60°    | 10137.9 | 45.0      |
| 0°-90°    | 11910.8 | 52.9      |
| 90°-120°  | 2257.9  | 10.0      |
| 90°-150°  | 7670.8  | 34.1      |
| 90°-180°  | 10609.0 | 47.1      |
| 0°-180°   | 22520.0 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 5786 | 5786  | 5786 | 5786  | 5786 |      |
| 5°   | 5786 | 5760  | 5692 | 5739  | 5723 | 549  |
| 15°  | 5503 | 5446  | 5268 | 5168  | 5116 | 1551 |
| 25°  | 4996 | 4828  | 4482 | 4268  | 4189 | 2297 |
| 35°  | 4304 | 4037  | 3577 | 3247  | 3131 | 2694 |
| 45°  | 3519 | 3168  | 2618 | 2246  | 2121 | 2718 |
| 55°  | 2676 | 2267  | 1702 | 1388  | 1288 | 2391 |
| 65°  | 1807 | 1382  | 911  | 733   | 717  | 1791 |
| 75°  | 963  | 597   | 419  | 382   | 377  | 1019 |
| 85°  | 225  | 115   | 99   | 99    | 99   | 258  |
| 90°  | 3    | 41    | 112  | 105   | 109  | 22   |
| 95°  | 167  | 199   | 205  | 205   | 199  | 186  |
| 105° | 689  | 698   | 705  | 710   | 710  | 727  |
| 115° | 1281 | 1300  | 1294 | 1291  | 1281 | 1267 |
| 125° | 1864 | 1892  | 1883 | 1873  | 1870 | 1666 |
| 135° | 2411 | 2446  | 2453 | 2450  | 2440 | 1863 |
| 145° | 2927 | 2950  | 2968 | 2971  | 2959 | 1829 |
| 155° | 3347 | 3356  | 3366 | 3382  | 3372 | 1540 |
| 165° | 3641 | 3637  | 3637 | 3660  | 3644 | 1027 |
| 175° | 3788 | 3779  | 3772 | 3795  | 3776 | 360  |
| 180° | 3795 | 3795  | 3795 | 3795  | 3795 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 5786.2 | 5786.2 | 5786.2 | 5786.2 | 5786.2 |
| 2.5°   | 5812.3 | 5786.2 | 5728.4 | 5781.2 | 5770.6 |
| 5°     | 5786.2 | 5760.1 | 5691.7 | 5739.0 | 5723.4 |
| 7.5°   | 5739.0 | 5707.8 | 5634.5 | 5655.1 | 5629.0 |
| 10°    | 5676.2 | 5639.5 | 5535.1 | 5518.9 | 5487.8 |
| 12.5°  | 5597.8 | 5550.6 | 5408.9 | 5377.8 | 5320.1 |
| 15°    | 5503.4 | 5445.6 | 5267.8 | 5168.4 | 5116.2 |
| 17.5°  | 5393.4 | 5309.5 | 5089.5 | 4974.5 | 4890.6 |
| 20°    | 5267.8 | 5162.8 | 4901.2 | 4770.6 | 4655.1 |
| 22.5°  | 5131.7 | 5011.2 | 4707.3 | 4529.5 | 4451.2 |
| 25°    | 4995.6 | 4827.8 | 4482.3 | 4267.8 | 4188.9 |
| 27.5°  | 4833.4 | 4655.1 | 4272.8 | 4026.7 | 3906.2 |
| 30°    | 4660.6 | 4461.2 | 4042.3 | 3775.6 | 3633.9 |
| 32.5°  | 4492.8 | 4251.7 | 3822.8 | 3508.4 | 3377.3 |
| 35°    | 4304.5 | 4037.3 | 3576.7 | 3246.7 | 3131.1 |
| 37.5°  | 4121.2 | 3832.8 | 3346.1 | 2984.5 | 2853.9 |
| 40°    | 3927.3 | 3613.4 | 3105.0 | 2733.4 | 2597.3 |
| 42.5°  | 3728.4 | 3393.4 | 2864.5 | 2476.7 | 2346.1 |
| 45°    | 3518.9 | 3167.8 | 2618.4 | 2246.1 | 2120.6 |
| 47.5°  | 3320.0 | 2948.4 | 2382.8 | 2010.6 | 1895.6 |
| 50°    | 3100.0 | 2728.4 | 2152.2 | 1790.6 | 1681.1 |
| 52.5°  | 2885.0 | 2492.2 | 1932.2 | 1586.7 | 1487.2 |
| 55°    | 2675.6 | 2267.2 | 1701.7 | 1387.8 | 1288.3 |
| 57.5°  | 2461.1 | 2042.2 | 1497.8 | 1204.5 | 1120.6 |
| 60°    | 2241.1 | 1822.2 | 1282.8 | 1016.1 | 932.2  |
| 62.5°  | 2026.7 | 1607.8 | 1099.5 | 848.3  | 806.7  |
| 65°    | 1806.7 | 1382.2 | 911.1  | 733.3  | 717.2  |
| 67.5°  | 1597.2 | 1172.8 | 733.3  | 643.9  | 628.3  |
| 70°    | 1377.2 | 968.9  | 607.2  | 555.0  | 533.9  |
| 72.5°  | 1167.8 | 780.0  | 507.8  | 466.1  | 455.6  |
| 75°    | 963.3  | 596.7  | 418.9  | 382.2  | 377.2  |
| 77.5°  | 759.5  | 423.9  | 330.0  | 308.9  | 298.3  |
| 80°    | 570.6  | 303.9  | 251.1  | 230.6  | 230.6  |
| 82.5°  | 397.8  | 204.4  | 172.8  | 162.2  | 162.2  |
| 85°    | 225.0  | 115.0  | 99.4   | 99.4   | 99.4   |
| 87.5°  | 83.9   | 41.7   | 41.7   | 36.7   | 36.7   |
| 90°    | 3.4    | 41.2   | 112.1  | 105.3  | 108.7  |
| 92.5°  | 70.9   | 96.1   | 99.5   | 103.0  | 103.0  |
| 95°    | 167.0  | 199.1  | 204.8  | 204.8  | 199.1  |
| 97.5°  | 278.0  | 307.8  | 320.4  | 320.4  | 320.4  |
| 100°   | 406.2  | 432.5  | 441.6  | 441.6  | 438.2  |
| 102.5° | 541.2  | 560.6  | 573.2  | 576.7  | 573.2  |
| 105°   | 688.8  | 697.9  | 704.8  | 710.5  | 710.5  |
| 107.5° | 835.2  | 849.0  | 849.0  | 851.2  | 835.2  |
| 110°   | 977.1  | 995.4  | 995.4  | 995.4  | 986.3  |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 1130.4 | 1149.9 | 1146.4 | 1137.3 | 1130.4 |
| 115°   | 1281.4 | 1299.8 | 1294.0 | 1290.6 | 1281.4 |
| 117.5° | 1431.3 | 1456.5 | 1440.5 | 1431.3 | 1422.2 |
| 120°   | 1582.4 | 1607.5 | 1582.4 | 1582.4 | 1572.1 |
| 122.5° | 1719.7 | 1751.7 | 1735.7 | 1726.5 | 1719.7 |
| 125°   | 1863.8 | 1892.4 | 1883.3 | 1873.0 | 1869.5 |
| 127.5° | 2004.6 | 2040.0 | 2027.4 | 2013.7 | 2004.6 |
| 130°   | 2136.1 | 2177.3 | 2171.6 | 2164.7 | 2152.1 |
| 132.5° | 2283.7 | 2315.8 | 2318.0 | 2302.0 | 2292.9 |
| 135°   | 2410.7 | 2446.2 | 2453.1 | 2449.6 | 2440.5 |
| 137.5° | 2552.6 | 2581.2 | 2586.9 | 2584.6 | 2570.9 |
| 140°   | 2677.3 | 2705.9 | 2721.9 | 2721.9 | 2709.3 |
| 142.5° | 2805.5 | 2834.1 | 2843.2 | 2846.6 | 2834.1 |
| 145°   | 2926.7 | 2949.6 | 2967.9 | 2971.4 | 2958.8 |
| 147.5° | 3035.4 | 3064.0 | 3077.8 | 3083.5 | 3070.9 |
| 150°   | 3147.6 | 3167.0 | 3179.6 | 3189.9 | 3179.6 |
| 152.5° | 3247.1 | 3266.5 | 3282.6 | 3295.2 | 3282.6 |
| 155°   | 3346.6 | 3355.8 | 3366.1 | 3382.1 | 3371.8 |
| 157.5° | 3432.5 | 3439.3 | 3445.0 | 3467.9 | 3451.9 |
| 160°   | 3509.1 | 3516.0 | 3519.4 | 3538.9 | 3525.1 |
| 162.5° | 3580.0 | 3580.0 | 3583.5 | 3605.2 | 3589.2 |
| 165°   | 3640.7 | 3637.3 | 3637.3 | 3660.1 | 3644.1 |
| 167.5° | 3695.6 | 3685.3 | 3685.3 | 3708.2 | 3692.2 |
| 170°   | 3736.8 | 3727.6 | 3724.2 | 3747.1 | 3727.6 |
| 172.5° | 3765.4 | 3756.2 | 3752.8 | 3775.7 | 3756.2 |
| 175°   | 3788.3 | 3779.1 | 3772.3 | 3795.1 | 3775.7 |
| 177.5° | 3800.9 | 3791.7 | 3784.8 | 3804.3 | 3784.8 |
| 180°   | 3795.1 | 3795.1 | 3795.1 | 3795.1 | 3795.1 |

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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 | 12.29            | 13.15 | 13.23 | 14.10 | 15.33 | 8.25           | 9.11  | 9.19  | 10.06 | 11.29 |
|                 | 3H   | 13.98            | 14.74 | 14.93 | 15.70 | 16.96 | 9.44           | 10.21 | 10.40 | 11.17 | 12.42 |
|                 | 4H   | 14.59            | 15.31 | 15.55 | 16.28 | 17.54 | 9.90           | 10.62 | 10.86 | 11.58 | 12.85 |
|                 | 6H   | 15.02            | 15.68 | 15.99 | 16.65 | 17.93 | 10.22          | 10.88 | 11.19 | 11.85 | 13.13 |
|                 | 8H   | 15.15            | 15.78 | 16.13 | 16.76 | 18.04 | 10.31          | 10.94 | 11.29 | 11.93 | 13.20 |
|                 | 12H  | 15.21            | 15.81 | 16.20 | 16.79 | 18.09 | 10.36          | 10.96 | 11.34 | 11.94 | 13.24 |
| 4H              | 2H   | 12.31            | 13.04 | 13.28 | 14.00 | 15.26 | 8.85           | 9.58  | 9.82  | 10.54 | 11.81 |
|                 | 3H   | 14.15            | 14.75 | 15.13 | 15.74 | 17.02 | 10.21          | 10.81 | 11.19 | 11.80 | 13.08 |
|                 | 4H   | 14.85            | 15.39 | 15.83 | 16.38 | 17.68 | 10.76          | 11.30 | 11.75 | 12.29 | 13.60 |
|                 | 6H   | 15.37            | 15.84 | 16.37 | 16.85 | 18.15 | 11.18          | 11.65 | 12.18 | 12.66 | 13.96 |
|                 | 8H   | 15.55            | 15.99 | 16.55 | 16.99 | 18.30 | 11.31          | 11.75 | 12.31 | 12.75 | 14.07 |
|                 | 12H  | 15.64            | 16.04 | 16.66 | 17.06 | 18.38 | 11.38          | 11.77 | 12.39 | 12.79 | 14.11 |
| 8H              | 4H   | 14.82            | 15.26 | 15.82 | 16.26 | 17.57 | 11.04          | 11.48 | 12.04 | 12.49 | 13.80 |
|                 | 6H   | 15.39            | 15.75 | 16.41 | 16.80 | 18.11 | 11.56          | 11.93 | 12.59 | 12.97 | 14.28 |
|                 | 8H   | 15.61            | 15.93 | 16.64 | 16.96 | 18.29 | 11.75          | 12.07 | 12.79 | 13.11 | 14.44 |
|                 | 12H  | 15.75            | 16.03 | 16.79 | 17.06 | 18.43 | 11.88          | 12.16 | 12.91 | 13.18 | 14.56 |
| 12H             | 4H   | 14.77            | 15.17 | 15.79 | 16.19 | 17.51 | 11.05          | 11.44 | 12.07 | 12.47 | 13.78 |
|                 | 6H   | 15.36            | 15.68 | 16.40 | 16.72 | 18.05 | 11.61          | 11.93 | 12.65 | 12.97 | 14.30 |
|                 | 8H   | 15.59            | 15.87 | 16.63 | 16.90 | 18.27 | 11.83          | 12.11 | 12.86 | 13.13 | 14.51 |