

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: P915128

Luminaire Tested: DFN2DIP-SQ4F0-140D140US927-FLLFLL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P915128  
REPORT IS A COMBINATION OF REPORTS P900199 AND P896915  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-SQ4F0-140D140US927-FLLFLL  
Description: 4 foot, Square Define Geo, with Direct Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

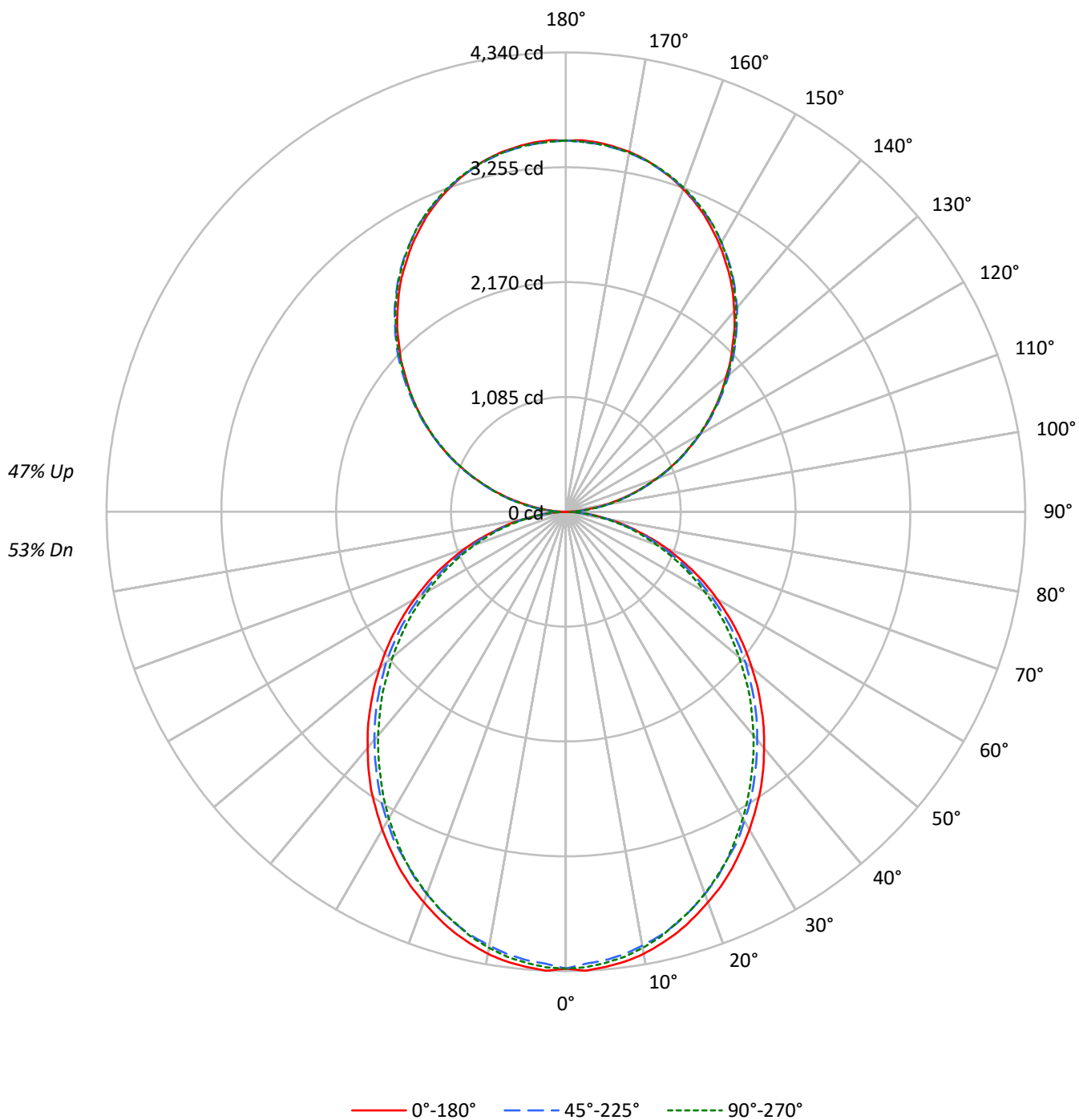
Lumens per Lamp: N/A  
Luminaire Lumens: 20794.8 lumens  
Efficiency: N/A  
Efficacy: 83.3 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 3.92' x L: 3.92' x H: 0.1')  
CIE Type: General Diffuse

Input Watts (W): 249.6  
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: P915128

CATALOG NUMBER: DFN2DIP-SQ4F0-140D140US927-FLLFL

**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   | 98  | 94  | 90  | 87  | 91  | 87  | 84  | 81  | 74 | 72 | 70 | 63 | 61 | 59 | 52 | 51 | 50 |
| 2   | 90  | 82  | 76  | 71  | 83  | 76  | 71  | 66  | 65 | 61 | 58 | 55 | 52 | 50 | 46 | 44 | 42 |
| 3   | 82  | 72  | 65  | 59  | 75  | 67  | 61  | 55  | 58 | 53 | 49 | 49 | 45 | 42 | 41 | 38 | 36 |
| 4   | 75  | 64  | 56  | 50  | 69  | 60  | 52  | 47  | 51 | 46 | 41 | 43 | 39 | 36 | 36 | 33 | 31 |
| 5   | 69  | 57  | 49  | 43  | 63  | 53  | 46  | 40  | 46 | 40 | 36 | 39 | 35 | 31 | 33 | 29 | 27 |
| 6   | 63  | 51  | 43  | 37  | 58  | 48  | 40  | 35  | 41 | 36 | 31 | 35 | 31 | 27 | 30 | 26 | 24 |
| 7   | 59  | 46  | 38  | 33  | 54  | 43  | 36  | 31  | 37 | 32 | 28 | 32 | 28 | 24 | 27 | 24 | 21 |
| 8   | 54  | 42  | 34  | 29  | 50  | 39  | 32  | 27  | 34 | 29 | 24 | 29 | 25 | 22 | 25 | 21 | 19 |
| 9   | 51  | 38  | 31  | 26  | 47  | 36  | 29  | 24  | 31 | 26 | 22 | 27 | 23 | 19 | 23 | 20 | 17 |
| 10  | 47  | 35  | 28  | 23  | 44  | 33  | 26  | 22  | 29 | 23 | 20 | 25 | 21 | 18 | 21 | 18 | 15 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 3028 | 3028 | 3028 |
| 5°  | 3033 | 2986 | 3007 |
| 10° | 3008 | 2947 | 2967 |
| 15° | 2964 | 2899 | 2904 |
| 20° | 2904 | 2832 | 2840 |
| 25° | 2845 | 2752 | 2765 |
| 30° | 2770 | 2678 | 2671 |
| 35° | 2699 | 2590 | 2570 |
| 40° | 2612 | 2501 | 2475 |
| 45° | 2526 | 2412 | 2377 |
| 50° | 2431 | 2319 | 2264 |
| 55° | 2332 | 2211 | 2160 |
| 60° | 2219 | 2083 | 2041 |
| 65° | 2097 | 1950 | 1901 |
| 70° | 1941 | 1789 | 1750 |
| 75° | 1725 | 1596 | 1613 |
| 80° | 1466 | 1350 | 1347 |
| 85° | 1059 | 923  | 906  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 90°

Vertical Angle: 90°

Luminance: 2759 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 406.2   | 2.0       |
| 10°-20°   | 1142.8  | 5.5       |
| 20°-30°   | 1679.5  | 8.1       |
| 30°-40°   | 1950.6  | 9.4       |
| 40°-50°   | 1948.2  | 9.4       |
| 50°-60°   | 1698.7  | 8.2       |
| 60°-70°   | 1255.7  | 6.0       |
| 70°-80°   | 710.5   | 3.4       |
| 80°-90°   | 197.5   | 0.9       |
| 90°-100°  | 217.0   | 1.0       |
| 100°-110° | 689.6   | 3.3       |
| 110°-120° | 1180.2  | 5.7       |
| 120°-130° | 1552.1  | 7.5       |
| 130°-140° | 1742.2  | 8.4       |
| 140°-150° | 1708.4  | 8.2       |
| 150°-160° | 1433.1  | 6.9       |
| 160°-170° | 950.4   | 4.6       |
| 170°-180° | 332.2   | 1.6       |
| 0°-30°    | 3228.4  | 15.5      |
| 0°-40°    | 5179.0  | 24.9      |
| 0°-60°    | 8825.9  | 42.4      |
| 0°-90°    | 10989.6 | 52.8      |
| 90°-120°  | 2086.8  | 10.0      |
| 90°-150°  | 7089.5  | 34.1      |
| 90°-180°  | 9805.0  | 47.2      |
| 0°-180°   | 20794.8 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 4315 | 4315  | 4315 | 4315  | 4315 |      |
| 5°   | 4315 | 4299  | 4253 | 4286  | 4278 | 410  |
| 15°  | 4108 | 4083  | 4029 | 4046  | 4025 | 1157 |
| 25°  | 3718 | 3685  | 3614 | 3622  | 3614 | 1711 |
| 35°  | 3208 | 3166  | 3100 | 3075  | 3054 | 2003 |
| 45°  | 2610 | 2581  | 2519 | 2473  | 2457 | 2014 |
| 55°  | 1976 | 1950  | 1901 | 1851  | 1830 | 1766 |
| 65°  | 1332 | 1307  | 1266 | 1228  | 1208 | 1317 |
| 75°  | 697  | 689   | 668  | 643   | 652  | 744  |
| 85°  | 170  | 166   | 162  | 149   | 145  | 190  |
| 90°  | 3    | 38    | 104  | 97    | 100  | 20   |
| 95°  | 154  | 184   | 189  | 189   | 184  | 172  |
| 105° | 637  | 645   | 651  | 657   | 657  | 672  |
| 115° | 1184 | 1201  | 1196 | 1193  | 1184 | 1171 |
| 125° | 1723 | 1749  | 1740 | 1731  | 1728 | 1539 |
| 135° | 2228 | 2261  | 2267 | 2264  | 2256 | 1722 |
| 145° | 2705 | 2726  | 2743 | 2746  | 2734 | 1690 |
| 155° | 3093 | 3102  | 3111 | 3126  | 3116 | 1424 |
| 165° | 3365 | 3362  | 3362 | 3383  | 3368 | 949  |
| 175° | 3501 | 3493  | 3486 | 3508  | 3490 | 333  |
| 180° | 3508 | 3508  | 3508 | 3508  | 3508 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 4315.4 | 4315.4 | 4315.4 | 4315.4 | 4315.4 |
| 2.5°   | 4340.4 | 4319.8 | 4274.0 | 4315.4 | 4307.5 |
| 5°     | 4315.4 | 4299.1 | 4253.3 | 4286.3 | 4278.4 |
| 7.5°   | 4286.3 | 4261.7 | 4215.9 | 4249.3 | 4240.9 |
| 10°    | 4240.9 | 4211.9 | 4162.2 | 4195.2 | 4182.9 |
| 12.5°  | 4178.4 | 4153.8 | 4104.1 | 4124.7 | 4116.4 |
| 15°    | 4108.0 | 4083.4 | 4029.2 | 4046.0 | 4025.2 |
| 17.5°  | 4020.9 | 3996.2 | 3942.1 | 3962.7 | 3942.1 |
| 20°    | 3925.3 | 3900.7 | 3842.6 | 3854.9 | 3838.6 |
| 22.5°  | 3830.2 | 3792.8 | 3738.6 | 3738.6 | 3730.3 |
| 25°    | 3717.9 | 3684.9 | 3614.5 | 3622.4 | 3614.5 |
| 27.5°  | 3593.3 | 3564.3 | 3510.6 | 3498.3 | 3477.6 |
| 30°    | 3469.2 | 3435.8 | 3373.7 | 3361.4 | 3344.6 |
| 32.5°  | 3336.3 | 3311.6 | 3245.1 | 3220.1 | 3203.3 |
| 35°    | 3207.7 | 3166.3 | 3099.8 | 3074.8 | 3054.0 |
| 37.5°  | 3062.4 | 3025.0 | 2958.5 | 2929.5 | 2908.7 |
| 40°    | 2913.2 | 2879.7 | 2813.2 | 2776.3 | 2759.5 |
| 42.5°  | 2767.9 | 2734.5 | 2668.4 | 2626.6 | 2601.9 |
| 45°    | 2610.2 | 2581.2 | 2518.7 | 2473.3 | 2456.6 |
| 47.5°  | 2456.6 | 2427.6 | 2361.1 | 2315.3 | 2290.7 |
| 50°    | 2294.6 | 2274.0 | 2215.8 | 2157.7 | 2137.0 |
| 52.5°  | 2137.0 | 2107.9 | 2054.2 | 2008.4 | 1979.4 |
| 55°    | 1975.5 | 1950.4 | 1900.6 | 1850.9 | 1830.2 |
| 57.5°  | 1813.4 | 1792.7 | 1738.6 | 1688.9 | 1672.1 |
| 60°    | 1651.4 | 1635.1 | 1577.0 | 1531.2 | 1518.8 |
| 62.5°  | 1493.8 | 1464.7 | 1423.3 | 1382.0 | 1365.2 |
| 65°    | 1332.2 | 1307.1 | 1265.7 | 1228.3 | 1207.6 |
| 67.5°  | 1166.2 | 1145.1 | 1108.1 | 1079.0 | 1062.3 |
| 70°    | 1012.6 | 995.9  | 958.5  | 929.4  | 913.1  |
| 72.5°  | 855.0  | 838.2  | 817.5  | 788.5  | 776.2  |
| 75°    | 697.0  | 689.0  | 667.9  | 643.3  | 651.6  |
| 77.5°  | 556.0  | 539.3  | 530.9  | 518.6  | 506.3  |
| 80°    | 415.2  | 410.7  | 402.4  | 390.1  | 381.7  |
| 82.5°  | 282.2  | 282.2  | 278.2  | 261.5  | 261.5  |
| 85°    | 169.9  | 166.0  | 162.0  | 149.2  | 145.3  |
| 87.5°  | 74.9   | 66.5   | 58.1   | 45.8   | 41.4   |
| 90°    | 3.2    | 38.1   | 103.6  | 97.3   | 100.4  |
| 92.5°  | 65.6   | 88.8   | 92.0   | 95.1   | 95.1   |
| 95°    | 154.4  | 184.0  | 189.3  | 189.3  | 184.0  |
| 97.5°  | 257.0  | 284.5  | 296.1  | 296.1  | 296.1  |
| 100°   | 375.4  | 399.7  | 408.1  | 408.1  | 405.0  |
| 102.5° | 500.2  | 518.2  | 529.8  | 533.0  | 529.8  |
| 105°   | 636.6  | 645.1  | 651.4  | 656.6  | 656.6  |
| 107.5° | 771.9  | 784.7  | 784.7  | 786.7  | 771.9  |
| 110°   | 903.1  | 920.0  | 920.0  | 920.0  | 911.5  |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 1044.7 | 1062.7 | 1059.5 | 1051.1 | 1044.7 |
| 115°   | 1184.3 | 1201.3 | 1196.0 | 1192.8 | 1184.3 |
| 117.5° | 1322.9 | 1346.2 | 1331.3 | 1322.9 | 1314.4 |
| 120°   | 1462.4 | 1485.7 | 1462.4 | 1462.4 | 1452.9 |
| 122.5° | 1589.4 | 1618.9 | 1604.2 | 1595.7 | 1589.4 |
| 125°   | 1722.6 | 1749.0 | 1740.5 | 1731.0 | 1727.8 |
| 127.5° | 1852.6 | 1885.4 | 1873.7 | 1861.1 | 1852.6 |
| 130°   | 1974.2 | 2012.3 | 2007.0 | 2000.7 | 1989.0 |
| 132.5° | 2110.6 | 2140.2 | 2142.4 | 2127.6 | 2119.1 |
| 135°   | 2228.0 | 2260.8 | 2267.1 | 2264.0 | 2255.5 |
| 137.5° | 2359.1 | 2385.6 | 2390.9 | 2388.7 | 2376.1 |
| 140°   | 2474.4 | 2500.8 | 2515.7 | 2515.7 | 2504.0 |
| 142.5° | 2592.8 | 2619.3 | 2627.7 | 2630.9 | 2619.3 |
| 145°   | 2704.9 | 2726.1 | 2743.0 | 2746.2 | 2734.5 |
| 147.5° | 2805.4 | 2831.8 | 2844.5 | 2849.8 | 2838.1 |
| 150°   | 2909.0 | 2927.0 | 2938.6 | 2948.1 | 2938.6 |
| 152.5° | 3001.0 | 3019.0 | 3033.8 | 3045.4 | 3033.8 |
| 155°   | 3093.0 | 3101.5 | 3111.0 | 3125.8 | 3116.3 |
| 157.5° | 3172.3 | 3178.6 | 3183.9 | 3205.1 | 3190.3 |
| 160°   | 3243.2 | 3249.5 | 3252.7 | 3270.7 | 3257.9 |
| 162.5° | 3308.7 | 3308.7 | 3311.9 | 3332.0 | 3317.2 |
| 165°   | 3364.8 | 3361.6 | 3361.6 | 3382.8 | 3368.0 |
| 167.5° | 3415.5 | 3406.0 | 3406.0 | 3427.1 | 3412.3 |
| 170°   | 3453.6 | 3445.1 | 3441.9 | 3463.1 | 3445.1 |
| 172.5° | 3480.1 | 3471.6 | 3468.4 | 3489.6 | 3471.6 |
| 175°   | 3501.2 | 3492.7 | 3486.4 | 3507.5 | 3489.6 |
| 177.5° | 3512.8 | 3504.4 | 3498.0 | 3515.9 | 3498.0 |
| 180°   | 3507.5 | 3507.5 | 3507.5 | 3507.5 | 3507.5 |

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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 | 11.39            | 12.28 | 12.32 | 13.23 | 14.46 | 10.95          | 11.84 | 11.88 | 12.79 | 14.02 |
|                 | 3H   | 13.06            | 13.85 | 14.00 | 14.81 | 16.07 | 12.57          | 13.36 | 13.51 | 14.32 | 15.58 |
|                 | 4H   | 13.65            | 14.40 | 14.61 | 15.37 | 16.63 | 13.16          | 13.91 | 14.11 | 14.87 | 16.14 |
|                 | 6H   | 14.06            | 14.75 | 15.02 | 15.72 | 16.99 | 13.55          | 14.25 | 14.52 | 15.22 | 16.49 |
|                 | 8H   | 14.16            | 14.82 | 15.14 | 15.81 | 17.08 | 13.66          | 14.32 | 14.64 | 15.31 | 16.58 |
|                 | 12H  | 14.21            | 14.84 | 15.19 | 15.82 | 17.12 | 13.70          | 14.33 | 14.69 | 15.31 | 16.61 |
| 4H              | 2H   | 11.86            | 12.61 | 12.82 | 13.57 | 14.84 | 11.50          | 12.26 | 12.47 | 13.22 | 14.48 |
|                 | 3H   | 13.73            | 14.36 | 14.70 | 15.35 | 16.63 | 13.32          | 13.95 | 14.30 | 14.94 | 16.22 |
|                 | 4H   | 14.45            | 15.02 | 15.43 | 16.01 | 17.31 | 14.02          | 14.60 | 15.01 | 15.59 | 16.89 |
|                 | 6H   | 14.97            | 15.46 | 15.96 | 16.47 | 17.77 | 14.54          | 15.03 | 15.53 | 16.04 | 17.34 |
|                 | 8H   | 15.12            | 15.58 | 16.12 | 16.59 | 17.90 | 14.68          | 15.15 | 15.68 | 16.15 | 17.46 |
|                 | 12H  | 15.20            | 15.62 | 16.21 | 16.64 | 17.95 | 14.75          | 15.17 | 15.76 | 16.19 | 17.50 |
| 8H              | 4H   | 14.65            | 15.11 | 15.64 | 16.11 | 17.43 | 14.27          | 14.73 | 15.27 | 15.74 | 17.05 |
|                 | 6H   | 15.28            | 15.67 | 16.31 | 16.71 | 18.02 | 14.90          | 15.28 | 15.92 | 16.33 | 17.64 |
|                 | 8H   | 15.51            | 15.85 | 16.54 | 16.88 | 18.21 | 15.12          | 15.45 | 16.15 | 16.49 | 17.82 |
|                 | 12H  | 15.64            | 15.94 | 16.68 | 16.97 | 18.34 | 15.23          | 15.53 | 16.27 | 16.56 | 17.93 |
| 12H             | 4H   | 14.63            | 15.05 | 15.65 | 16.07 | 17.39 | 14.27          | 14.68 | 15.28 | 15.70 | 17.02 |
|                 | 6H   | 15.31            | 15.65 | 16.34 | 16.68 | 18.01 | 14.94          | 15.28 | 15.97 | 16.31 | 17.64 |
|                 | 8H   | 15.56            | 15.86 | 16.59 | 16.88 | 18.26 | 15.18          | 15.48 | 16.21 | 16.50 | 17.88 |