

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: P917886

Luminaire Tested: DFN2DIP-SQ4F0-160D110US930-RLLFLL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P917886  
REPORT IS A COMBINATION OF REPORTS P900166 AND P896915  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-SQ4F0-160D110US930-RLLFLL  
Description: 4 foot, Square Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

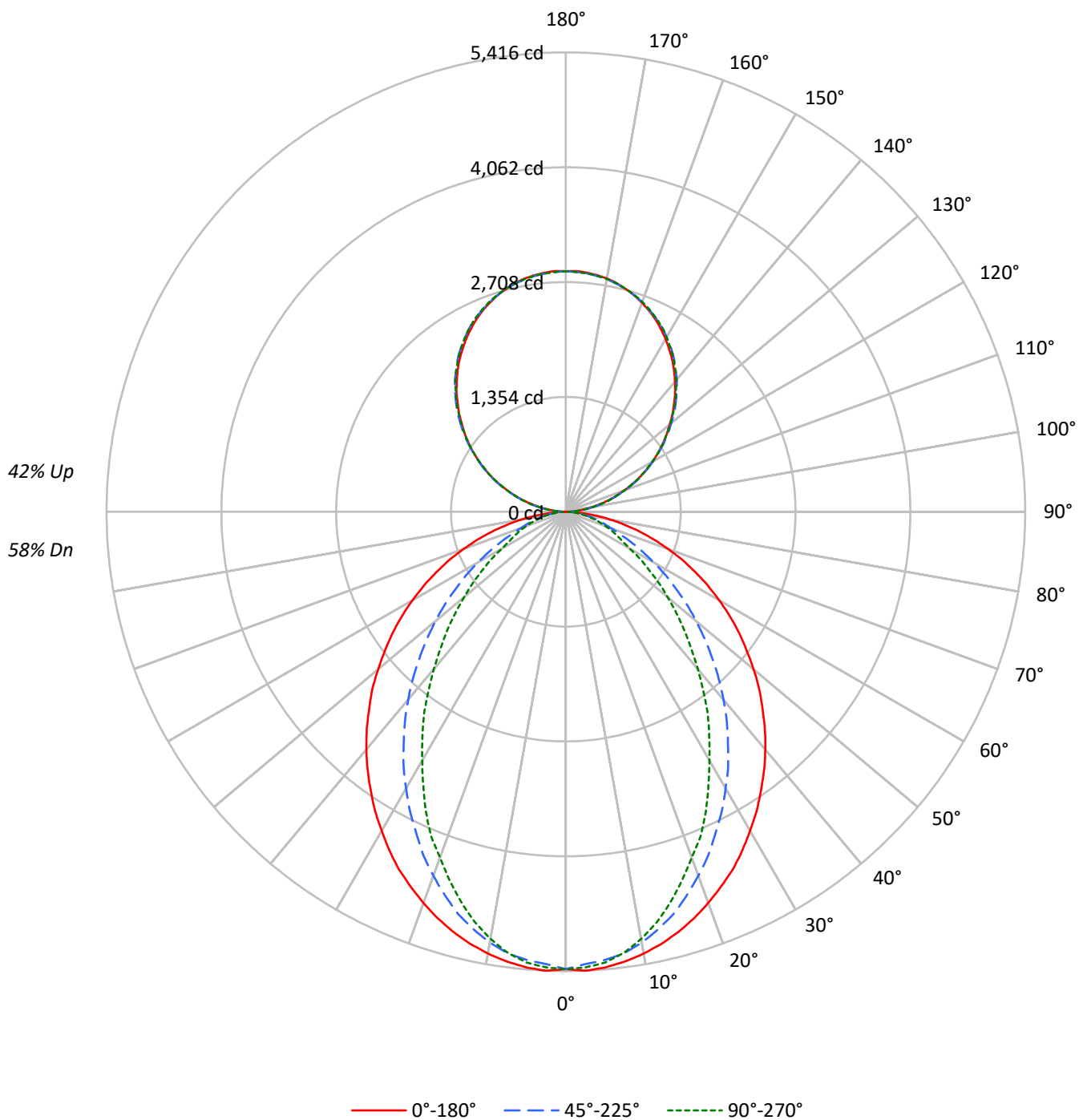
**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 19025.0 lumens  
Efficiency: N/A  
Efficacy: 76.3 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): 249.5  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9971  
Total Harmonic Distortion (THDi): 0.049  
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: P917886

CATALOG NUMBER: DFN2DIP-SQ4F0-160D110US930-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   | 109 | 109 | 109 | 109 | 102 | 102 | 102 | 102 | 88 | 88 | 88 | 75 | 75 | 75 | 64 | 64 | 64 |
| 1   | 100 | 96  | 92  | 89  | 93  | 90  | 87  | 84  | 78 | 76 | 73 | 67 | 65 | 64 | 57 | 56 | 55 |
| 2   | 92  | 85  | 79  | 74  | 85  | 79  | 74  | 70  | 69 | 65 | 62 | 60 | 57 | 54 | 51 | 49 | 47 |
| 3   | 84  | 75  | 68  | 62  | 78  | 70  | 64  | 59  | 61 | 57 | 53 | 53 | 50 | 47 | 46 | 43 | 41 |
| 4   | 77  | 67  | 59  | 53  | 72  | 63  | 56  | 50  | 55 | 50 | 45 | 48 | 44 | 40 | 41 | 38 | 36 |
| 5   | 71  | 60  | 52  | 46  | 66  | 56  | 49  | 44  | 50 | 44 | 40 | 43 | 39 | 35 | 37 | 34 | 31 |
| 6   | 66  | 54  | 46  | 40  | 61  | 51  | 44  | 38  | 45 | 39 | 35 | 39 | 35 | 31 | 34 | 31 | 28 |
| 7   | 61  | 49  | 41  | 36  | 57  | 46  | 39  | 34  | 41 | 35 | 31 | 36 | 31 | 28 | 31 | 28 | 25 |
| 8   | 57  | 45  | 37  | 32  | 53  | 42  | 35  | 30  | 37 | 32 | 28 | 33 | 29 | 25 | 29 | 25 | 23 |
| 9   | 53  | 41  | 33  | 28  | 49  | 39  | 32  | 27  | 34 | 29 | 25 | 31 | 26 | 23 | 27 | 23 | 21 |
| 10  | 50  | 38  | 30  | 26  | 46  | 36  | 29  | 25  | 32 | 26 | 23 | 28 | 24 | 21 | 25 | 21 | 19 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 3783 | 3783 | 3783 |
| 5°  | 3789 | 3724 | 3748 |
| 10° | 3751 | 3651 | 3627 |
| 15° | 3700 | 3531 | 3439 |
| 20° | 3631 | 3366 | 3209 |
| 25° | 3561 | 3180 | 2986 |
| 30° | 3467 | 2989 | 2704 |
| 35° | 3375 | 2784 | 2455 |
| 40° | 3282 | 2572 | 2170 |
| 45° | 3173 | 2337 | 1912 |
| 50° | 3060 | 2099 | 1659 |
| 55° | 2942 | 1845 | 1417 |
| 60° | 2806 | 1579 | 1167 |
| 65° | 2650 | 1308 | 1052 |
| 70° | 2460 | 1056 | 954  |
| 75° | 2222 | 932  | 870  |
| 80° | 1877 | 785  | 758  |
| 85° | 1306 | 528  | 578  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 3173 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 505.3   | 2.7       |
| 10°-20°   | 1387.1  | 7.3       |
| 20°-30°   | 1947.5  | 10.2      |
| 30°-40°   | 2122.9  | 11.2      |
| 40°-50°   | 1951.1  | 10.3      |
| 50°-60°   | 1532.3  | 8.1       |
| 60°-70°   | 997.4   | 5.2       |
| 70°-80°   | 513.4   | 2.7       |
| 80°-90°   | 139.1   | 0.7       |
| 90°-100°  | 175.5   | 0.9       |
| 100°-110° | 557.7   | 2.9       |
| 110°-120° | 954.3   | 5.0       |
| 120°-130° | 1255.1  | 6.6       |
| 130°-140° | 1408.8  | 7.4       |
| 140°-150° | 1381.5  | 7.3       |
| 150°-160° | 1158.9  | 6.1       |
| 160°-170° | 768.5   | 4.0       |
| 170°-180° | 268.6   | 1.4       |
| 0°-30°    | 3839.9  | 20.2      |
| 0°-40°    | 5962.7  | 31.3      |
| 0°-60°    | 9446.2  | 49.7      |
| 0°-90°    | 11096.1 | 58.3      |
| 90°-120°  | 1687.5  | 8.9       |
| 90°-150°  | 5732.8  | 30.1      |
| 90°-180°  | 7929.0  | 41.7      |
| 0°-180°   | 19025.0 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 5391 | 5391  | 5391 | 5391  | 5391 |      |
| 5°   | 5391 | 5367  | 5303 | 5347  | 5333 | 511  |
| 15°  | 5128 | 5074  | 4908 | 4816  | 4767 | 1445 |
| 25°  | 4655 | 4498  | 4176 | 3977  | 3903 | 2141 |
| 35°  | 4011 | 3762  | 3333 | 3025  | 2918 | 2510 |
| 45°  | 3279 | 2952  | 2440 | 2093  | 1976 | 2532 |
| 55°  | 2493 | 2112  | 1586 | 1293  | 1200 | 2228 |
| 65°  | 1683 | 1288  | 849  | 683   | 668  | 1669 |
| 75°  | 898  | 556   | 390  | 356   | 352  | 949  |
| 85°  | 210  | 107   | 93   | 93    | 93   | 241  |
| 90°  | 2    | 31    | 84   | 79    | 81   | 19   |
| 95°  | 125  | 149   | 153  | 153   | 149  | 139  |
| 105° | 515  | 522   | 527  | 531   | 531  | 543  |
| 115° | 958  | 971   | 967  | 965   | 958  | 947  |
| 125° | 1393 | 1414  | 1407 | 1400  | 1397 | 1245 |
| 135° | 1802 | 1828  | 1833 | 1831  | 1824 | 1393 |
| 145° | 2187 | 2204  | 2218 | 2221  | 2211 | 1367 |
| 155° | 2501 | 2508  | 2516 | 2528  | 2520 | 1151 |
| 165° | 2721 | 2718  | 2718 | 2735  | 2723 | 768  |
| 175° | 2831 | 2824  | 2819 | 2836  | 2822 | 269  |
| 180° | 2836 | 2836  | 2836 | 2836  | 2836 |      |



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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 5391.4 | 5391.4 | 5391.4 | 5391.4 | 5391.4 |
| 2.5°   | 5415.7 | 5391.4 | 5337.5 | 5386.8 | 5376.9 |
| 5°     | 5391.4 | 5367.0 | 5303.4 | 5347.4 | 5332.9 |
| 7.5°   | 5347.4 | 5318.4 | 5250.0 | 5269.2 | 5244.9 |
| 10°    | 5288.9 | 5254.8 | 5157.4 | 5142.4 | 5113.4 |
| 12.5°  | 5215.9 | 5171.9 | 5039.9 | 5010.9 | 4957.1 |
| 15°    | 5127.9 | 5074.1 | 4908.4 | 4815.7 | 4767.0 |
| 17.5°  | 5025.4 | 4947.2 | 4742.3 | 4635.1 | 4556.9 |
| 20°    | 4908.4 | 4810.6 | 4566.7 | 4445.1 | 4337.5 |
| 22.5°  | 4781.6 | 4669.2 | 4386.1 | 4220.5 | 4147.4 |
| 25°    | 4654.8 | 4498.4 | 4176.4 | 3976.6 | 3903.2 |
| 27.5°  | 4503.6 | 4337.5 | 3981.3 | 3752.0 | 3639.7 |
| 30°    | 4342.6 | 4156.8 | 3766.4 | 3518.0 | 3386.0 |
| 32.5°  | 4186.3 | 3961.6 | 3562.0 | 3269.0 | 3146.8 |
| 35°    | 4010.8 | 3761.8 | 3332.7 | 3025.2 | 2917.5 |
| 37.5°  | 3840.0 | 3571.3 | 3117.9 | 2780.8 | 2659.2 |
| 40°    | 3659.3 | 3366.9 | 2893.2 | 2546.8 | 2420.0 |
| 42.5°  | 3474.0 | 3161.8 | 2669.0 | 2307.7 | 2186.1 |
| 45°    | 3278.8 | 2951.7 | 2439.7 | 2092.9 | 1975.9 |
| 47.5°  | 3093.5 | 2747.2 | 2220.2 | 1873.4 | 1766.3 |
| 50°    | 2888.5 | 2542.2 | 2005.4 | 1668.4 | 1566.4 |
| 52.5°  | 2688.2 | 2322.2 | 1800.4 | 1478.5 | 1385.8 |
| 55°    | 2493.0 | 2112.5 | 1585.6 | 1293.1 | 1200.4 |
| 57.5°  | 2293.2 | 1902.9 | 1395.6 | 1122.3 | 1044.1 |
| 60°    | 2088.2 | 1697.9 | 1195.2 | 946.8  | 868.6  |
| 62.5°  | 1888.4 | 1498.1 | 1024.4 | 790.4  | 751.6  |
| 65°    | 1683.4 | 1287.9 | 849.0  | 683.3  | 668.3  |
| 67.5°  | 1488.2 | 1092.7 | 683.3  | 600.0  | 585.5  |
| 70°    | 1283.3 | 902.8  | 565.8  | 517.1  | 497.5  |
| 72.5°  | 1088.1 | 726.8  | 473.1  | 434.3  | 424.4  |
| 75°    | 897.6  | 556.0  | 390.3  | 356.1  | 351.5  |
| 77.5°  | 707.6  | 394.9  | 307.4  | 287.8  | 278.0  |
| 80°    | 531.7  | 283.2  | 234.0  | 214.8  | 214.8  |
| 82.5°  | 370.6  | 190.5  | 161.0  | 151.2  | 151.2  |
| 85°    | 209.6  | 107.1  | 92.7   | 92.7   | 92.7   |
| 87.5°  | 78.2   | 38.8   | 38.8   | 34.2   | 34.2   |
| 90°    | 2.5    | 30.8   | 83.8   | 78.7   | 81.2   |
| 92.5°  | 53.0   | 71.8   | 74.4   | 77.0   | 77.0   |
| 95°    | 124.8  | 148.8  | 153.0  | 153.0  | 148.8  |
| 97.5°  | 207.8  | 230.0  | 239.5  | 239.5  | 239.5  |
| 100°   | 303.5  | 323.2  | 330.0  | 330.0  | 327.5  |
| 102.5° | 404.5  | 419.0  | 428.4  | 431.0  | 428.4  |
| 105°   | 514.8  | 521.6  | 526.8  | 531.0  | 531.0  |
| 107.5° | 624.2  | 634.5  | 634.5  | 636.2  | 624.2  |
| 110°   | 730.3  | 744.0  | 744.0  | 744.0  | 737.1  |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 844.8  | 859.3  | 856.8  | 849.9  | 844.8  |
| 115°   | 957.7  | 971.3  | 967.1  | 964.6  | 957.7  |
| 117.5° | 1069.8 | 1088.5 | 1076.5 | 1069.8 | 1062.9 |
| 120°   | 1182.6 | 1201.4 | 1182.6 | 1182.6 | 1174.9 |
| 122.5° | 1285.2 | 1309.1 | 1297.1 | 1290.3 | 1285.2 |
| 125°   | 1392.9 | 1414.3 | 1407.4 | 1399.8 | 1397.2 |
| 127.5° | 1498.1 | 1524.6 | 1515.2 | 1505.0 | 1498.1 |
| 130°   | 1596.4 | 1627.3 | 1622.9 | 1617.8 | 1608.4 |
| 132.5° | 1706.7 | 1730.7 | 1732.4 | 1720.4 | 1713.6 |
| 135°   | 1801.6 | 1828.1 | 1833.3 | 1830.8 | 1823.9 |
| 137.5° | 1907.7 | 1929.1 | 1933.3 | 1931.6 | 1921.4 |
| 140°   | 2000.9 | 2022.3 | 2034.3 | 2034.3 | 2024.9 |
| 142.5° | 2096.7 | 2118.1 | 2124.9 | 2127.4 | 2118.1 |
| 145°   | 2187.3 | 2204.4 | 2218.1 | 2220.6 | 2211.3 |
| 147.5° | 2268.6 | 2289.9 | 2300.2 | 2304.4 | 2295.1 |
| 150°   | 2352.4 | 2366.9 | 2376.3 | 2384.0 | 2376.3 |
| 152.5° | 2426.7 | 2441.2 | 2453.2 | 2462.7 | 2453.2 |
| 155°   | 2501.2 | 2507.9 | 2515.7 | 2527.7 | 2519.9 |
| 157.5° | 2565.3 | 2570.4 | 2574.6 | 2591.8 | 2579.8 |
| 160°   | 2622.6 | 2627.7 | 2630.2 | 2644.8 | 2634.6 |
| 162.5° | 2675.6 | 2675.6 | 2678.2 | 2694.4 | 2682.4 |
| 165°   | 2720.9 | 2718.3 | 2718.3 | 2735.4 | 2723.4 |
| 167.5° | 2761.9 | 2754.2 | 2754.2 | 2771.4 | 2759.4 |
| 170°   | 2792.7 | 2785.9 | 2783.3 | 2800.4 | 2785.9 |
| 172.5° | 2814.1 | 2807.2 | 2804.7 | 2821.8 | 2807.2 |
| 175°   | 2831.2 | 2824.4 | 2819.2 | 2836.3 | 2821.8 |
| 177.5° | 2840.6 | 2833.7 | 2828.6 | 2843.2 | 2828.6 |
| 180°   | 2836.3 | 2836.3 | 2836.3 | 2836.3 | 2836.3 |

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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 | 12.52            | 13.43 | 13.41 | 14.33 | 15.48 | 8.49           | 9.39  | 9.38  | 10.29 | 11.44 |
|                 | 3H   | 14.21            | 15.02 | 15.11 | 15.93 | 17.11 | 9.68           | 10.49 | 10.58 | 11.40 | 12.58 |
|                 | 4H   | 14.83            | 15.59 | 15.74 | 16.51 | 17.69 | 10.13          | 10.90 | 11.05 | 11.82 | 13.00 |
|                 | 6H   | 15.26            | 15.96 | 16.18 | 16.88 | 18.08 | 10.46          | 11.16 | 11.39 | 12.09 | 13.29 |
|                 | 8H   | 15.39            | 16.05 | 16.32 | 17.00 | 18.19 | 10.55          | 11.22 | 11.49 | 12.16 | 13.36 |
|                 | 12H  | 15.45            | 16.09 | 16.39 | 17.02 | 18.25 | 10.60          | 11.23 | 11.54 | 12.17 | 13.39 |
| 4H              | 2H   | 12.55            | 13.31 | 13.47 | 14.23 | 15.42 | 9.09           | 9.85  | 10.01 | 10.77 | 11.96 |
|                 | 3H   | 14.39            | 15.03 | 15.33 | 15.98 | 17.18 | 10.45          | 11.08 | 11.38 | 12.03 | 13.23 |
|                 | 4H   | 15.09            | 15.67 | 16.03 | 16.61 | 17.84 | 11.00          | 11.58 | 11.94 | 12.52 | 13.75 |
|                 | 6H   | 15.61            | 16.11 | 16.57 | 17.08 | 18.31 | 11.43          | 11.92 | 12.38 | 12.89 | 14.12 |
|                 | 8H   | 15.79            | 16.26 | 16.75 | 17.22 | 18.46 | 11.56          | 12.02 | 12.51 | 12.98 | 14.22 |
|                 | 12H  | 15.89            | 16.31 | 16.87 | 17.29 | 18.54 | 11.63          | 12.04 | 12.60 | 13.02 | 14.27 |
| 8H              | 4H   | 15.06            | 15.53 | 16.02 | 16.49 | 17.73 | 11.29          | 11.75 | 12.25 | 12.72 | 13.95 |
|                 | 6H   | 15.64            | 16.02 | 16.62 | 17.03 | 18.26 | 11.81          | 12.19 | 12.80 | 13.20 | 14.44 |
|                 | 8H   | 15.86            | 16.20 | 16.85 | 17.19 | 18.44 | 12.00          | 12.34 | 13.00 | 13.34 | 14.59 |
|                 | 12H  | 16.00            | 16.30 | 17.00 | 17.29 | 18.59 | 12.13          | 12.43 | 13.12 | 13.41 | 14.71 |
| 12H             | 4H   | 15.02            | 15.44 | 16.00 | 16.42 | 17.66 | 11.30          | 11.72 | 12.27 | 12.70 | 13.94 |
|                 | 6H   | 15.61            | 15.95 | 16.61 | 16.95 | 18.20 | 11.86          | 12.20 | 12.85 | 13.19 | 14.45 |
|                 | 8H   | 15.84            | 16.14 | 16.84 | 17.12 | 18.43 | 12.08          | 12.38 | 13.07 | 13.36 | 14.66 |