

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: P909219

Luminaire Tested: DFN2DIP-SQ3F0-080D050US840-RLLONL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P909219  
REPORT IS A COMBINATION OF REPORTS P901408 AND P898289  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-SQ3F0-080D050US840-RLLONL  
Description: 3 foot, Square Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

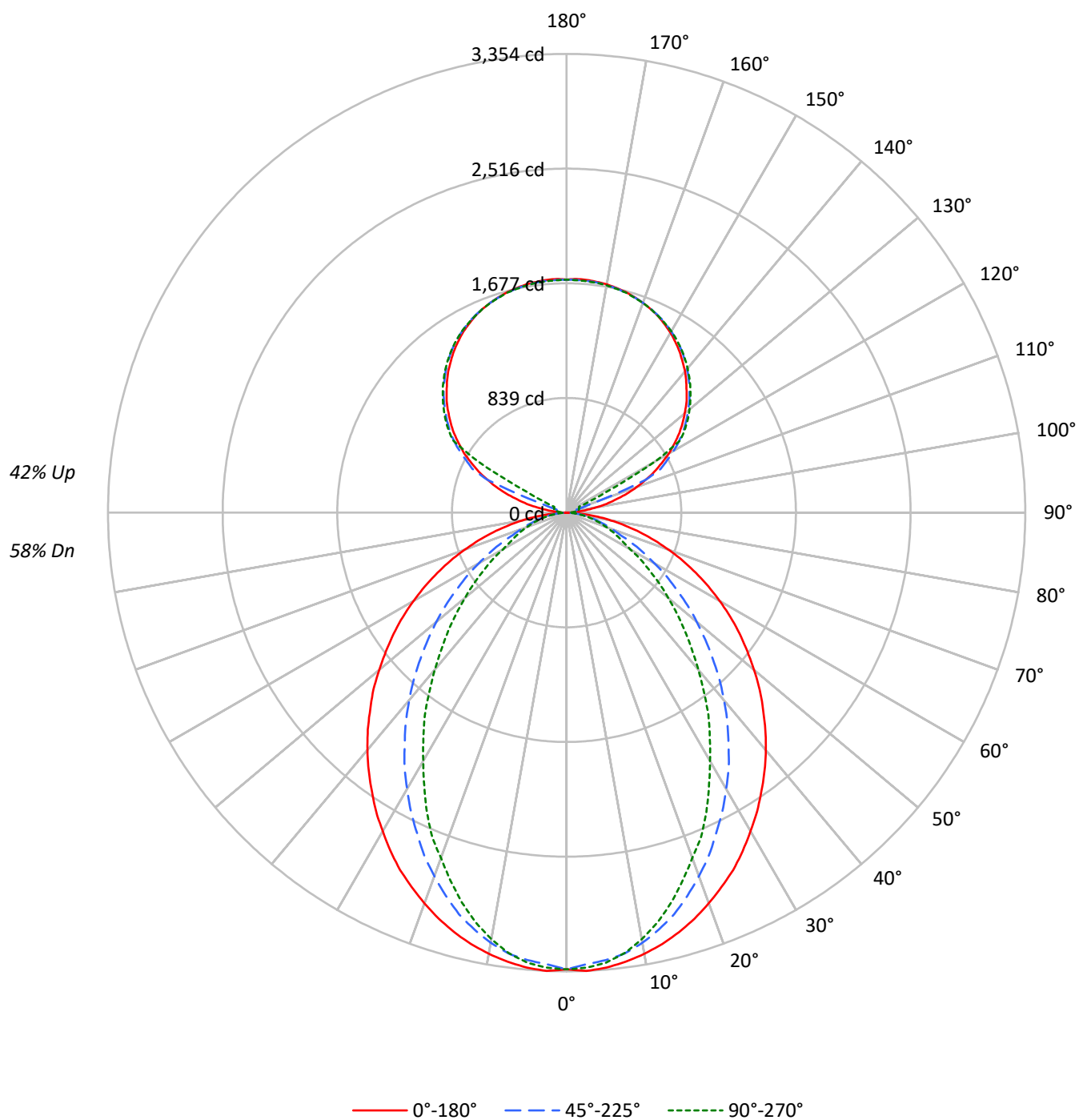
Lumens per Lamp: N/A  
Luminaire Lumens: 11865.9 lumens  
Efficiency: N/A  
Efficacy: 104.9 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 0.99 / 1.16  
Luminous Opening: Rectangular w/ Sides (W: 3.06' x L: 3.06' x H: 0.1')  
CIE Type: General Diffuse

Input Watts (W): 113.1  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9952  
Total Harmonic Distortion (THDi): 0.069  
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   | 109 | 109 | 109 | 109 | 102 | 102 | 102 | 102 | 88 | 88 | 88 | 75 | 75 | 75 | 63 | 63 | 63 |
| 1   | 100 | 96  | 92  | 89  | 93  | 90  | 86  | 83  | 78 | 75 | 73 | 67 | 65 | 64 | 57 | 56 | 55 |
| 2   | 92  | 84  | 79  | 74  | 85  | 79  | 74  | 69  | 69 | 65 | 62 | 59 | 57 | 54 | 51 | 49 | 47 |
| 3   | 84  | 75  | 68  | 62  | 78  | 70  | 64  | 59  | 61 | 56 | 52 | 53 | 49 | 46 | 45 | 43 | 41 |
| 4   | 77  | 67  | 59  | 53  | 72  | 62  | 56  | 50  | 55 | 49 | 45 | 48 | 44 | 40 | 41 | 38 | 35 |
| 5   | 71  | 60  | 52  | 46  | 66  | 56  | 49  | 44  | 49 | 44 | 39 | 43 | 39 | 35 | 37 | 34 | 31 |
| 6   | 66  | 54  | 46  | 40  | 61  | 51  | 43  | 38  | 45 | 39 | 35 | 39 | 35 | 31 | 34 | 31 | 28 |
| 7   | 61  | 49  | 41  | 35  | 57  | 46  | 39  | 34  | 41 | 35 | 31 | 36 | 31 | 28 | 31 | 28 | 25 |
| 8   | 57  | 44  | 37  | 32  | 53  | 42  | 35  | 30  | 37 | 32 | 28 | 33 | 28 | 25 | 29 | 25 | 23 |
| 9   | 53  | 41  | 33  | 28  | 49  | 39  | 32  | 27  | 34 | 29 | 25 | 30 | 26 | 23 | 27 | 23 | 20 |
| 10  | 49  | 38  | 30  | 26  | 46  | 36  | 29  | 25  | 32 | 26 | 23 | 28 | 24 | 21 | 25 | 21 | 19 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 3826 | 3826 | 3826 |
| 5°  | 3830 | 3763 | 3788 |
| 10° | 3789 | 3686 | 3663 |
| 15° | 3735 | 3562 | 3472 |
| 20° | 3663 | 3392 | 3237 |
| 25° | 3590 | 3201 | 3010 |
| 30° | 3493 | 3006 | 2723 |
| 35° | 3397 | 2797 | 2471 |
| 40° | 3299 | 2580 | 2182 |
| 45° | 3186 | 2340 | 1920 |
| 50° | 3069 | 2099 | 1665 |
| 55° | 2947 | 1840 | 1419 |
| 60° | 2805 | 1571 | 1167 |
| 65° | 2642 | 1297 | 1049 |
| 70° | 2444 | 1042 | 947  |
| 75° | 2194 | 913  | 859  |
| 80° | 1833 | 758  | 741  |
| 85° | 1244 | 494  | 550  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 3186 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 312.9   | 2.6       |
| 10°-20°   | 859.1   | 7.2       |
| 20°-30°   | 1206.1  | 10.2      |
| 30°-40°   | 1314.7  | 11.1      |
| 40°-50°   | 1208.4  | 10.2      |
| 50°-60°   | 949.0   | 8.0       |
| 60°-70°   | 617.7   | 5.2       |
| 70°-80°   | 318.0   | 2.7       |
| 80°-90°   | 84.2    | 0.7       |
| 90°-100°  | 56.2    | 0.5       |
| 100°-110° | 209.5   | 1.8       |
| 110°-120° | 555.6   | 4.7       |
| 120°-130° | 921.4   | 7.8       |
| 130°-140° | 978.8   | 8.2       |
| 140°-150° | 909.7   | 7.7       |
| 150°-160° | 731.3   | 6.2       |
| 160°-170° | 471.2   | 4.0       |
| 170°-180° | 162.2   | 1.4       |
| 0°-30°    | 2378.1  | 20.0      |
| 0°-40°    | 3692.9  | 31.1      |
| 0°-60°    | 5850.2  | 49.3      |
| 0°-90°    | 6870.1  | 57.9      |
| 90°-120°  | 821.2   | 6.9       |
| 90°-150°  | 3631.1  | 30.6      |
| 90°-180°  | 4996.0  | 42.1      |
| 0°-180°   | 11865.9 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 3339 | 3339  | 3339 | 3339  | 3339 |      |
| 5°   | 3339 | 3324  | 3284 | 3312  | 3303 | 317  |
| 15°  | 3176 | 3142  | 3040 | 2982  | 2952 | 895  |
| 25°  | 2883 | 2786  | 2587 | 2463  | 2417 | 1326 |
| 35°  | 2484 | 2330  | 2064 | 1874  | 1807 | 1555 |
| 45°  | 2031 | 1828  | 1511 | 1296  | 1224 | 1568 |
| 55°  | 1544 | 1308  | 982  | 801   | 744  | 1380 |
| 65°  | 1043 | 798   | 526  | 423   | 414  | 1034 |
| 75°  | 556  | 344   | 242  | 221   | 218  | 588  |
| 85°  | 130  | 66    | 57   | 57    | 57   | 149  |
| 90°  | 1    | 15    | 25   | 31    | 33   | 11   |
| 95°  | 80   | 39    | 48   | 54    | 53   | 95   |
| 105° | 375  | 412   | 75   | 89    | 94   | 401  |
| 115° | 709  | 730   | 761  | 190   | 101  | 698  |
| 125° | 1002 | 1019  | 1042 | 1051  | 1054 | 894  |
| 135° | 1240 | 1260  | 1271 | 1284  | 1281 | 958  |
| 145° | 1439 | 1438  | 1459 | 1467  | 1461 | 900  |
| 155° | 1584 | 1574  | 1588 | 1596  | 1586 | 730  |
| 165° | 1670 | 1662  | 1666 | 1674  | 1666 | 472  |
| 175° | 1708 | 1699  | 1702 | 1710  | 1698 | 163  |
| 180° | 1704 | 1704  | 1704 | 1704  | 1704 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 3339.0 | 3339.0 | 3339.0 | 3339.0 | 3339.0 |
| 2.5°   | 3354.1 | 3339.0 | 3305.7 | 3336.1 | 3330.0 |
| 5°     | 3339.0 | 3324.0 | 3284.5 | 3311.8 | 3302.8 |
| 7.5°   | 3311.8 | 3293.8 | 3251.5 | 3263.4 | 3248.2 |
| 10°    | 3275.5 | 3254.4 | 3194.1 | 3184.8 | 3166.8 |
| 12.5°  | 3230.4 | 3203.1 | 3121.3 | 3103.3 | 3070.0 |
| 15°    | 3175.8 | 3142.5 | 3039.9 | 2982.5 | 2952.3 |
| 17.5°  | 3112.3 | 3063.9 | 2937.0 | 2870.6 | 2822.2 |
| 20°    | 3039.9 | 2979.3 | 2828.3 | 2753.0 | 2686.2 |
| 22.5°  | 2961.3 | 2891.7 | 2716.4 | 2613.8 | 2568.6 |
| 25°    | 2882.8 | 2786.0 | 2586.6 | 2462.9 | 2417.3 |
| 27.5°  | 2789.1 | 2686.2 | 2465.7 | 2323.7 | 2254.1 |
| 30°    | 2689.5 | 2574.3 | 2332.7 | 2178.8 | 2097.0 |
| 32.5°  | 2592.6 | 2453.6 | 2206.1 | 2024.6 | 1948.9 |
| 35°    | 2484.0 | 2329.8 | 2064.0 | 1873.6 | 1806.9 |
| 37.5°  | 2378.1 | 2211.8 | 1931.0 | 1722.2 | 1646.9 |
| 40°    | 2266.3 | 2085.2 | 1791.8 | 1577.3 | 1498.7 |
| 42.5°  | 2151.5 | 1958.2 | 1652.9 | 1429.3 | 1353.8 |
| 45°    | 2030.6 | 1828.1 | 1511.0 | 1296.2 | 1223.8 |
| 47.5°  | 1915.9 | 1701.4 | 1375.0 | 1160.2 | 1093.9 |
| 50°    | 1788.9 | 1574.5 | 1242.0 | 1033.3 | 970.1  |
| 52.5°  | 1664.9 | 1438.1 | 1115.0 | 915.6  | 858.3  |
| 55°    | 1544.0 | 1308.4 | 982.0  | 800.8  | 743.5  |
| 57.5°  | 1420.3 | 1178.5 | 864.3  | 695.1  | 646.6  |
| 60°    | 1293.2 | 1051.6 | 740.2  | 586.3  | 538.0  |
| 62.5°  | 1169.5 | 927.8  | 634.5  | 489.6  | 465.5  |
| 65°    | 1042.6 | 797.6  | 525.7  | 423.2  | 413.8  |
| 67.5°  | 921.7  | 676.8  | 423.2  | 371.5  | 362.6  |
| 70°    | 794.8  | 559.2  | 350.4  | 320.2  | 308.1  |
| 72.5°  | 673.9  | 450.1  | 293.1  | 269.0  | 262.9  |
| 75°    | 555.9  | 344.4  | 241.8  | 220.6  | 217.7  |
| 77.5°  | 438.3  | 244.6  | 190.5  | 178.2  | 172.2  |
| 80°    | 329.2  | 175.4  | 144.9  | 133.0  | 133.0  |
| 82.5°  | 229.5  | 118.0  | 99.7   | 93.6   | 93.6   |
| 85°    | 129.9  | 66.3   | 57.4   | 57.4   | 57.4   |
| 87.5°  | 48.4   | 24.0   | 24.0   | 21.2   | 21.2   |
| 90°    | 1.2    | 14.7   | 24.6   | 30.9   | 33.2   |
| 92.5°  | 30.9   | 26.0   | 29.6   | 32.1   | 33.2   |
| 95°    | 80.1   | 39.4   | 48.1   | 54.3   | 53.0   |
| 97.5°  | 144.2  | 43.2   | 62.8   | 66.7   | 67.8   |
| 100°   | 218.3  | 49.4   | 70.3   | 80.1   | 82.6   |
| 102.5° | 299.6  | 297.2  | 72.8   | 86.2   | 90.1   |
| 105°   | 374.9  | 411.9  | 75.2   | 88.8   | 93.7   |
| 107.5° | 462.4  | 493.1  | 77.8   | 91.2   | 96.2   |
| 110°   | 546.3  | 572.1  | 215.8  | 92.5   | 97.4   |



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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 625.2  | 647.3  | 626.4  | 94.9   | 98.7   |
| 115°   | 709.0  | 729.9  | 760.8  | 190.0  | 101.2  |
| 117.5° | 781.7  | 806.4  | 827.5  | 651.0  | 328.0  |
| 120°   | 863.1  | 881.6  | 903.8  | 918.7  | 752.1  |
| 122.5° | 932.1  | 951.9  | 976.6  | 984.0  | 985.3  |
| 125°   | 1002.4 | 1018.6 | 1042.0 | 1050.6 | 1054.3 |
| 127.5° | 1066.5 | 1083.8 | 1102.5 | 1114.7 | 1115.9 |
| 130°   | 1127.0 | 1146.8 | 1160.2 | 1173.9 | 1172.8 |
| 132.5° | 1188.7 | 1204.8 | 1218.2 | 1229.4 | 1228.2 |
| 135°   | 1240.5 | 1260.3 | 1271.2 | 1283.7 | 1281.2 |
| 137.5° | 1294.6 | 1309.5 | 1321.9 | 1334.2 | 1330.6 |
| 140°   | 1347.7 | 1357.7 | 1371.1 | 1382.2 | 1376.1 |
| 142.5° | 1392.2 | 1400.9 | 1416.8 | 1426.6 | 1420.5 |
| 145°   | 1439.1 | 1437.7 | 1458.6 | 1467.3 | 1461.2 |
| 147.5° | 1479.7 | 1475.9 | 1496.9 | 1503.1 | 1498.2 |
| 150°   | 1519.1 | 1510.6 | 1530.2 | 1537.6 | 1531.5 |
| 152.5° | 1552.4 | 1542.6 | 1561.1 | 1568.5 | 1559.8 |
| 155°   | 1584.5 | 1573.5 | 1588.2 | 1595.6 | 1585.8 |
| 157.5° | 1610.3 | 1600.5 | 1611.6 | 1620.3 | 1610.3 |
| 160°   | 1632.6 | 1625.2 | 1632.6 | 1639.9 | 1631.3 |
| 162.5° | 1652.2 | 1645.0 | 1651.0 | 1659.7 | 1648.6 |
| 165°   | 1669.5 | 1662.2 | 1665.9 | 1674.5 | 1665.9 |
| 167.5° | 1683.1 | 1675.7 | 1679.5 | 1688.1 | 1677.0 |
| 170°   | 1694.3 | 1686.8 | 1689.3 | 1697.9 | 1686.8 |
| 172.5° | 1701.6 | 1694.3 | 1696.8 | 1705.4 | 1694.3 |
| 175°   | 1707.8 | 1699.1 | 1701.6 | 1710.2 | 1697.9 |
| 177.5° | 1710.2 | 1701.6 | 1702.9 | 1711.5 | 1700.4 |
| 180°   | 1704.0 | 1704.0 | 1704.0 | 1704.0 | 1704.0 |

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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 | 12.48            | 13.38 | 13.38 | 14.29 | 15.45 | 8.44           | 9.34  | 9.34  | 10.25 | 11.41 |
|                 | 3H   | 14.16            | 14.96 | 15.07 | 15.88 | 17.06 | 9.63           | 10.43 | 10.54 | 11.35 | 12.53 |
|                 | 4H   | 14.77            | 15.53 | 15.69 | 16.45 | 17.64 | 10.08          | 10.84 | 11.00 | 11.76 | 12.95 |
|                 | 6H   | 15.19            | 15.89 | 16.12 | 16.82 | 18.02 | 10.40          | 11.10 | 11.33 | 12.03 | 13.23 |
|                 | 8H   | 15.32            | 15.98 | 16.26 | 16.93 | 18.13 | 10.49          | 11.15 | 11.43 | 12.10 | 13.30 |
|                 | 12H  | 15.38            | 16.01 | 16.32 | 16.95 | 18.18 | 10.53          | 11.16 | 11.47 | 12.10 | 13.33 |
| 4H              | 2H   | 12.51            | 13.27 | 13.43 | 14.19 | 15.38 | 9.04           | 9.80  | 9.97  | 10.73 | 11.92 |
|                 | 3H   | 14.34            | 14.97 | 15.27 | 15.92 | 17.13 | 10.39          | 11.02 | 11.33 | 11.98 | 13.18 |
|                 | 4H   | 15.03            | 15.60 | 15.97 | 16.55 | 17.78 | 10.94          | 11.51 | 11.88 | 12.46 | 13.69 |
|                 | 6H   | 15.54            | 16.04 | 16.50 | 17.01 | 18.24 | 11.35          | 11.85 | 12.31 | 12.82 | 14.05 |
|                 | 8H   | 15.72            | 16.18 | 16.68 | 17.14 | 18.39 | 11.48          | 11.94 | 12.44 | 12.91 | 14.15 |
|                 | 12H  | 15.81            | 16.23 | 16.79 | 17.21 | 18.46 | 11.55          | 11.96 | 12.53 | 12.94 | 14.19 |
| 8H              | 4H   | 15.00            | 15.46 | 15.96 | 16.43 | 17.67 | 11.22          | 11.68 | 12.18 | 12.65 | 13.89 |
|                 | 6H   | 15.56            | 15.94 | 16.55 | 16.95 | 18.20 | 11.73          | 12.11 | 12.72 | 13.12 | 14.37 |
|                 | 8H   | 15.78            | 16.11 | 16.77 | 17.11 | 18.37 | 11.92          | 12.26 | 12.92 | 13.25 | 14.51 |
|                 | 12H  | 15.91            | 16.21 | 16.91 | 17.20 | 18.51 | 12.04          | 12.33 | 13.03 | 13.32 | 14.63 |
| 12H             | 4H   | 14.95            | 15.37 | 15.93 | 16.35 | 17.60 | 11.23          | 11.64 | 12.21 | 12.63 | 13.88 |
|                 | 6H   | 15.54            | 15.87 | 16.53 | 16.87 | 18.13 | 11.78          | 12.12 | 12.78 | 13.12 | 14.38 |
|                 | 8H   | 15.76            | 16.05 | 16.76 | 17.04 | 18.35 | 11.99          | 12.29 | 12.99 | 13.28 | 14.58 |