

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: P912709

Luminaire Tested: DFN2DIP-TR3F0-090D050US850-FLLONL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P912709  
REPORT IS A COMBINATION OF REPORTS P901831 AND P898751  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-TR3F0-090D050US850-FLLONL  
Description: 3 foot, Triangle Define Geo, with Direct Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

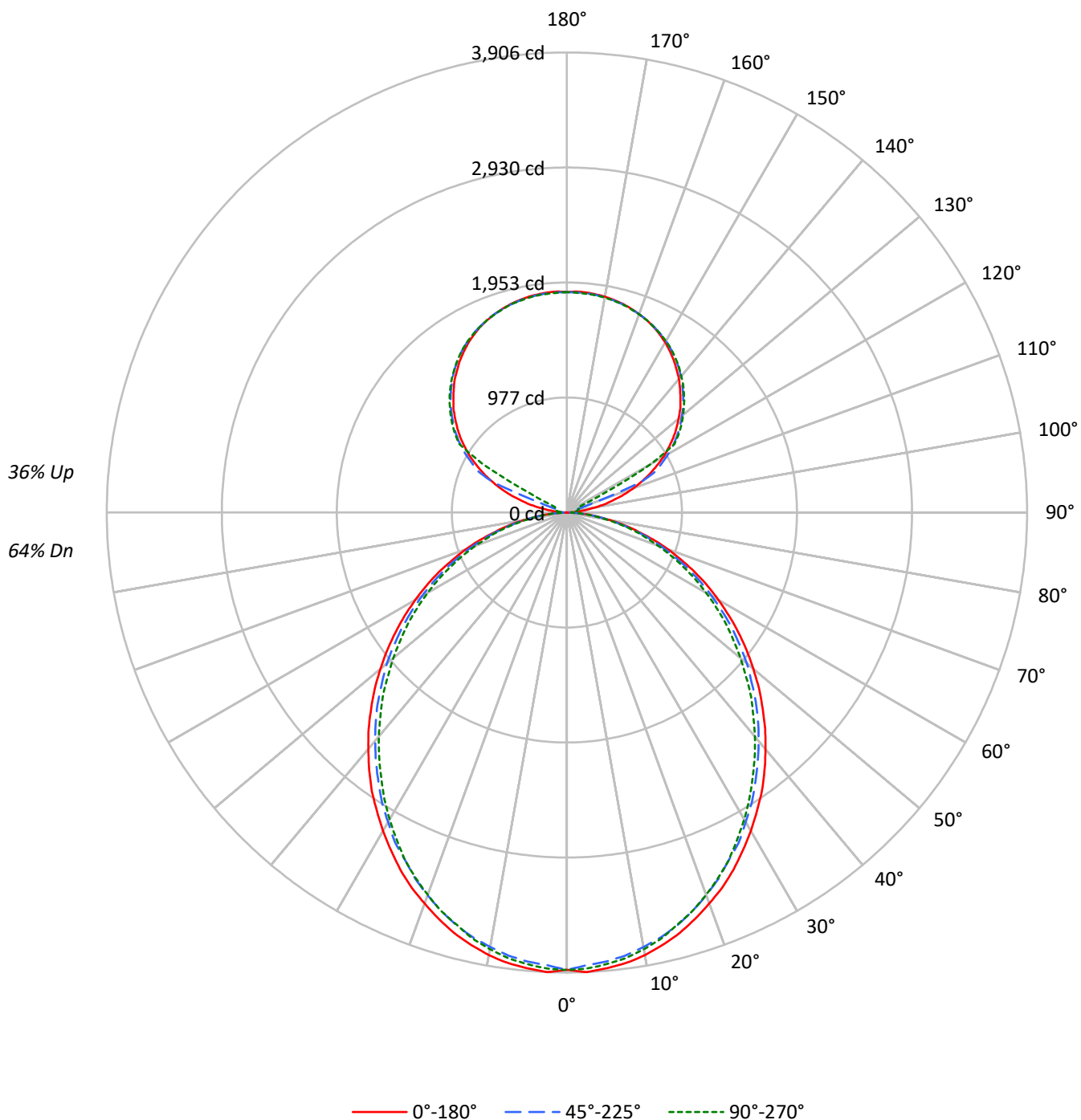
Lumens per Lamp: N/A  
Luminaire Lumens: 15370.8 lumens  
Efficiency: N/A  
Efficacy: 116.4 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 2.74' x L: 3.16' x H: 0.1')  
CIE Type: Semi-Direct

Input Watts (W): 132  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9951  
Total Harmonic Distortion (THDi): 0.07  
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   | 111 | 111 | 111 | 111 | 104 | 104 | 104 | 104 | 91 | 91 | 91 | 80 | 80 | 80 | 69 | 69 | 69 |
| 1   | 101 | 97  | 93  | 89  | 95  | 91  | 87  | 84  | 80 | 78 | 75 | 70 | 68 | 67 | 61 | 60 | 59 |
| 2   | 92  | 84  | 78  | 73  | 86  | 79  | 74  | 69  | 70 | 66 | 62 | 62 | 59 | 56 | 54 | 51 | 49 |
| 3   | 84  | 74  | 67  | 61  | 79  | 70  | 63  | 58  | 62 | 57 | 52 | 55 | 51 | 47 | 48 | 45 | 42 |
| 4   | 77  | 66  | 58  | 51  | 72  | 62  | 55  | 49  | 55 | 49 | 45 | 49 | 44 | 40 | 43 | 39 | 36 |
| 5   | 71  | 59  | 50  | 44  | 66  | 55  | 48  | 42  | 49 | 43 | 39 | 44 | 39 | 35 | 39 | 35 | 32 |
| 6   | 65  | 53  | 44  | 38  | 61  | 50  | 42  | 37  | 45 | 38 | 34 | 40 | 35 | 31 | 35 | 31 | 28 |
| 7   | 60  | 48  | 40  | 34  | 57  | 45  | 38  | 33  | 41 | 34 | 30 | 36 | 31 | 27 | 32 | 28 | 25 |
| 8   | 56  | 43  | 35  | 30  | 53  | 41  | 34  | 29  | 37 | 31 | 27 | 33 | 28 | 24 | 29 | 25 | 22 |
| 9   | 52  | 40  | 32  | 27  | 49  | 38  | 31  | 26  | 34 | 28 | 24 | 30 | 26 | 22 | 27 | 23 | 20 |
| 10  | 49  | 37  | 29  | 24  | 46  | 35  | 28  | 23  | 31 | 26 | 22 | 28 | 23 | 20 | 25 | 21 | 18 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 4839 | 4839 | 4839 |
| 5°  | 4844 | 4768 | 4801 |
| 10° | 4803 | 4700 | 4733 |
| 15° | 4729 | 4618 | 4628 |
| 20° | 4631 | 4507 | 4521 |
| 25° | 4534 | 4374 | 4398 |
| 30° | 4412 | 4250 | 4241 |
| 35° | 4296 | 4105 | 4077 |
| 40° | 4154 | 3958 | 3920 |
| 45° | 4013 | 3811 | 3759 |
| 50° | 3858 | 3656 | 3573 |
| 55° | 3695 | 3476 | 3401 |
| 60° | 3511 | 3264 | 3204 |
| 65° | 3310 | 3044 | 2971 |
| 70° | 3054 | 2775 | 2721 |
| 75° | 2701 | 2452 | 2484 |
| 80° | 2273 | 2040 | 2042 |
| 85° | 1605 | 1344 | 1319 |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 4013 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 365.5   | 2.4       |
| 10°-20°   | 1028.5  | 6.7       |
| 20°-30°   | 1511.4  | 9.8       |
| 30°-40°   | 1755.4  | 11.4      |
| 40°-50°   | 1753.3  | 11.4      |
| 50°-60°   | 1528.8  | 9.9       |
| 60°-70°   | 1130.1  | 7.4       |
| 70°-80°   | 639.4   | 4.2       |
| 80°-90°   | 172.1   | 1.1       |
| 90°-100°  | 61.7    | 0.4       |
| 100°-110° | 230.0   | 1.5       |
| 110°-120° | 610.1   | 4.0       |
| 120°-130° | 1011.9  | 6.6       |
| 130°-140° | 1074.8  | 7.0       |
| 140°-150° | 999.0   | 6.5       |
| 150°-160° | 803.1   | 5.2       |
| 160°-170° | 517.5   | 3.4       |
| 170°-180° | 178.1   | 1.2       |
| 0°-30°    | 2905.4  | 18.9      |
| 0°-40°    | 4660.9  | 30.3      |
| 0°-60°    | 7942.9  | 51.7      |
| 0°-90°    | 9884.5  | 64.3      |
| 90°-120°  | 901.9   | 5.9       |
| 90°-150°  | 3987.5  | 25.9      |
| 90°-180°  | 5486.0  | 35.7      |
| 0°-180°   | 15370.8 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 3884 | 3884  | 3884 | 3884  | 3884 |      |
| 5°   | 3884 | 3869  | 3828 | 3858  | 3850 | 369  |
| 15°  | 3697 | 3675  | 3626 | 3641  | 3622 | 1041 |
| 25°  | 3346 | 3316  | 3253 | 3260  | 3253 | 1540 |
| 35°  | 2887 | 2850  | 2790 | 2767  | 2748 | 1803 |
| 45°  | 2349 | 2323  | 2267 | 2226  | 2211 | 1813 |
| 55°  | 1778 | 1755  | 1710 | 1666  | 1647 | 1589 |
| 65°  | 1199 | 1176  | 1139 | 1106  | 1087 | 1185 |
| 75°  | 627  | 620   | 601  | 579   | 586  | 670  |
| 85°  | 153  | 149   | 146  | 134   | 131  | 171  |
| 90°  | 1    | 16    | 27   | 34    | 36   | 14   |
| 95°  | 88   | 43    | 53   | 60    | 58   | 104  |
| 105° | 412  | 452   | 83   | 98    | 103  | 440  |
| 115° | 779  | 802   | 836  | 209   | 111  | 767  |
| 125° | 1101 | 1118  | 1144 | 1154  | 1158 | 982  |
| 135° | 1362 | 1384  | 1396 | 1410  | 1407 | 1052 |
| 145° | 1580 | 1579  | 1602 | 1611  | 1605 | 988  |
| 155° | 1740 | 1728  | 1744 | 1752  | 1742 | 802  |
| 165° | 1833 | 1825  | 1829 | 1839  | 1829 | 518  |
| 175° | 1875 | 1866  | 1869 | 1878  | 1865 | 178  |
| 180° | 1871 | 1871  | 1871 | 1871  | 1871 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 3883.6 | 3883.6 | 3883.6 | 3883.6 | 3883.6 |
| 2.5°   | 3906.2 | 3887.6 | 3846.5 | 3883.6 | 3876.5 |
| 5°     | 3883.6 | 3869.0 | 3827.8 | 3857.5 | 3850.3 |
| 7.5°   | 3857.5 | 3835.4 | 3794.1 | 3824.3 | 3816.7 |
| 10°    | 3816.7 | 3790.6 | 3745.8 | 3775.5 | 3764.4 |
| 12.5°  | 3760.4 | 3738.2 | 3693.5 | 3712.0 | 3704.6 |
| 15°    | 3697.1 | 3674.9 | 3626.1 | 3641.2 | 3622.5 |
| 17.5°  | 3618.6 | 3596.4 | 3547.7 | 3566.3 | 3547.7 |
| 20°    | 3532.6 | 3510.4 | 3458.1 | 3469.2 | 3454.5 |
| 22.5°  | 3447.0 | 3413.4 | 3364.6 | 3364.6 | 3357.1 |
| 25°    | 3346.0 | 3316.2 | 3252.9 | 3260.0 | 3252.9 |
| 27.5°  | 3233.8 | 3207.7 | 3159.4 | 3148.3 | 3129.7 |
| 30°    | 3122.2 | 3092.0 | 3036.1 | 3025.0 | 3010.0 |
| 32.5°  | 3002.5 | 2980.3 | 2920.4 | 2897.9 | 2882.8 |
| 35°    | 2886.8 | 2849.6 | 2789.7 | 2767.2 | 2748.5 |
| 37.5°  | 2756.1 | 2722.4 | 2662.5 | 2636.4 | 2617.8 |
| 40°    | 2621.7 | 2591.6 | 2531.7 | 2498.5 | 2483.5 |
| 42.5°  | 2490.9 | 2460.9 | 2401.4 | 2363.8 | 2341.7 |
| 45°    | 2349.1 | 2323.0 | 2266.7 | 2225.9 | 2210.9 |
| 47.5°  | 2210.9 | 2184.7 | 2124.8 | 2083.7 | 2061.5 |
| 50°    | 2065.1 | 2046.4 | 1994.1 | 1941.9 | 1923.2 |
| 52.5°  | 1923.2 | 1897.1 | 1848.7 | 1807.6 | 1781.4 |
| 55°    | 1777.8 | 1755.2 | 1710.4 | 1665.7 | 1647.1 |
| 57.5°  | 1632.0 | 1613.4 | 1564.7 | 1519.9 | 1504.8 |
| 60°    | 1486.2 | 1471.5 | 1419.2 | 1378.0 | 1367.0 |
| 62.5°  | 1344.3 | 1318.2 | 1280.9 | 1243.7 | 1228.7 |
| 65°    | 1198.9 | 1176.3 | 1139.1 | 1105.5 | 1086.8 |
| 67.5°  | 1049.6 | 1030.6 | 997.2  | 971.2  | 956.1  |
| 70°    | 911.3  | 896.2  | 862.6  | 836.4  | 821.8  |
| 72.5°  | 769.4  | 754.3  | 735.7  | 709.6  | 698.6  |
| 75°    | 627.3  | 620.0  | 601.1  | 578.9  | 586.4  |
| 77.5°  | 500.4  | 485.4  | 477.9  | 466.8  | 455.7  |
| 80°    | 373.6  | 369.6  | 362.1  | 351.0  | 343.6  |
| 82.5°  | 254.0  | 254.0  | 250.4  | 235.3  | 235.3  |
| 85°    | 152.9  | 149.4  | 145.8  | 134.3  | 130.8  |
| 87.5°  | 67.3   | 59.8   | 52.3   | 41.3   | 37.3   |
| 90°    | 1.3    | 16.2   | 27.1   | 33.9   | 36.5   |
| 92.5°  | 33.9   | 28.5   | 32.5   | 35.3   | 36.5   |
| 95°    | 87.9   | 43.3   | 52.8   | 59.7   | 58.2   |
| 97.5°  | 158.4  | 47.5   | 69.0   | 73.2   | 74.4   |
| 100°   | 239.8  | 54.2   | 77.2   | 87.9   | 90.7   |
| 102.5° | 329.0  | 326.4  | 80.0   | 94.7   | 98.9   |
| 105°   | 411.7  | 452.4  | 82.6   | 97.5   | 102.9  |
| 107.5° | 507.8  | 541.5  | 85.4   | 100.1  | 105.7  |
| 110°   | 600.0  | 628.2  | 237.0  | 101.6  | 106.9  |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 686.6  | 710.9  | 687.9  | 104.2  | 108.3  |
| 115°   | 778.6  | 801.6  | 835.5  | 208.6  | 111.1  |
| 117.5° | 858.5  | 885.5  | 908.7  | 714.9  | 360.2  |
| 120°   | 947.9  | 968.2  | 992.6  | 1008.9 | 826.0  |
| 122.5° | 1023.6 | 1045.3 | 1072.5 | 1080.6 | 1082.1 |
| 125°   | 1100.8 | 1118.5 | 1144.3 | 1153.7 | 1157.8 |
| 127.5° | 1171.2 | 1190.2 | 1210.7 | 1224.1 | 1225.4 |
| 130°   | 1237.6 | 1259.4 | 1274.1 | 1289.1 | 1287.9 |
| 132.5° | 1305.4 | 1323.0 | 1337.8 | 1350.1 | 1348.8 |
| 135°   | 1362.3 | 1384.0 | 1396.0 | 1409.8 | 1407.0 |
| 137.5° | 1421.7 | 1438.0 | 1451.7 | 1465.2 | 1461.2 |
| 140°   | 1480.0 | 1490.9 | 1505.7 | 1517.9 | 1511.2 |
| 142.5° | 1528.9 | 1538.4 | 1555.9 | 1566.7 | 1559.9 |
| 145°   | 1580.3 | 1578.9 | 1601.8 | 1611.4 | 1604.6 |
| 147.5° | 1624.9 | 1620.8 | 1643.9 | 1650.6 | 1645.3 |
| 150°   | 1668.3 | 1658.8 | 1680.5 | 1688.6 | 1681.8 |
| 152.5° | 1704.8 | 1694.0 | 1714.3 | 1722.5 | 1713.0 |
| 155°   | 1740.0 | 1727.9 | 1744.1 | 1752.2 | 1741.5 |
| 157.5° | 1768.4 | 1757.7 | 1769.9 | 1779.4 | 1768.4 |
| 160°   | 1792.9 | 1784.7 | 1792.9 | 1800.9 | 1791.5 |
| 162.5° | 1814.4 | 1806.5 | 1813.1 | 1822.6 | 1810.4 |
| 165°   | 1833.4 | 1825.4 | 1829.4 | 1838.8 | 1829.4 |
| 167.5° | 1848.4 | 1840.2 | 1844.4 | 1853.8 | 1841.6 |
| 170°   | 1860.6 | 1852.4 | 1855.1 | 1864.6 | 1852.4 |
| 172.5° | 1868.7 | 1860.6 | 1863.3 | 1872.8 | 1860.6 |
| 175°   | 1875.4 | 1865.9 | 1868.7 | 1878.1 | 1864.6 |
| 177.5° | 1878.1 | 1868.7 | 1870.1 | 1879.5 | 1867.3 |
| 180°   | 1871.3 | 1871.3 | 1871.3 | 1871.3 | 1871.3 |

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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 | 13.92            | 14.93 | 14.75 | 15.78 | 16.83 | 13.50          | 14.50 | 14.32 | 15.35 | 16.40 |
|                 | 3H   | 15.59            | 16.49 | 16.42 | 17.34 | 18.42 | 15.12          | 16.02 | 15.95 | 16.88 | 17.96 |
|                 | 4H   | 16.17            | 17.03 | 17.03 | 17.89 | 18.98 | 15.71          | 16.56 | 16.56 | 17.42 | 18.51 |
|                 | 6H   | 16.57            | 17.36 | 17.44 | 18.23 | 19.33 | 16.10          | 16.89 | 16.97 | 17.76 | 18.86 |
|                 | 8H   | 16.68            | 17.43 | 17.55 | 18.32 | 19.42 | 16.21          | 16.96 | 17.08 | 17.85 | 18.95 |
|                 | 12H  | 16.73            | 17.44 | 17.61 | 18.33 | 19.45 | 16.25          | 16.97 | 17.13 | 17.85 | 18.98 |
| 4H              | 2H   | 14.40            | 15.25 | 15.26 | 16.12 | 17.21 | 14.06          | 14.91 | 14.91 | 15.77 | 16.86 |
|                 | 3H   | 16.27            | 16.98 | 17.14 | 17.88 | 18.98 | 15.88          | 16.59 | 16.75 | 17.49 | 18.59 |
|                 | 4H   | 16.98            | 17.63 | 17.86 | 18.52 | 19.65 | 16.58          | 17.23 | 17.46 | 18.12 | 19.25 |
|                 | 6H   | 17.49            | 18.06 | 18.39 | 18.97 | 20.11 | 17.09          | 17.65 | 17.99 | 18.57 | 19.70 |
|                 | 8H   | 17.64            | 18.17 | 18.54 | 19.08 | 20.23 | 17.24          | 17.76 | 18.14 | 18.67 | 19.82 |
|                 | 12H  | 17.72            | 18.19 | 18.64 | 19.12 | 20.27 | 17.30          | 17.78 | 18.22 | 18.71 | 19.86 |
| 8H              | 4H   | 17.18            | 17.71 | 18.08 | 18.62 | 19.77 | 16.83          | 17.35 | 17.73 | 18.26 | 19.41 |
|                 | 6H   | 17.81            | 18.25 | 18.74 | 19.20 | 20.34 | 17.45          | 17.89 | 18.38 | 18.84 | 19.99 |
|                 | 8H   | 18.03            | 18.41 | 18.96 | 19.36 | 20.52 | 17.66          | 18.05 | 18.60 | 18.99 | 20.16 |
|                 | 12H  | 18.16            | 18.50 | 19.10 | 19.43 | 20.65 | 17.78          | 18.12 | 18.72 | 19.06 | 20.27 |
| 12H             | 4H   | 17.18            | 17.65 | 18.10 | 18.58 | 19.73 | 16.83          | 17.30 | 17.75 | 18.23 | 19.38 |
|                 | 6H   | 17.84            | 18.23 | 18.78 | 19.17 | 20.33 | 17.49          | 17.88 | 18.43 | 18.82 | 19.99 |
|                 | 8H   | 18.08            | 18.42 | 19.02 | 19.36 | 20.57 | 17.73          | 18.07 | 18.67 | 19.01 | 20.22 |