

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: P908584

Luminaire Tested: DFN2DIP-PN3F0-090D060US840-FLLFLL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P908584  
REPORT IS A COMBINATION OF REPORTS P899565 AND P896399  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-PN3F0-090D060US840-FLLFLL  
Description: 3 foot, Pentagon Define Geo, with Direct Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

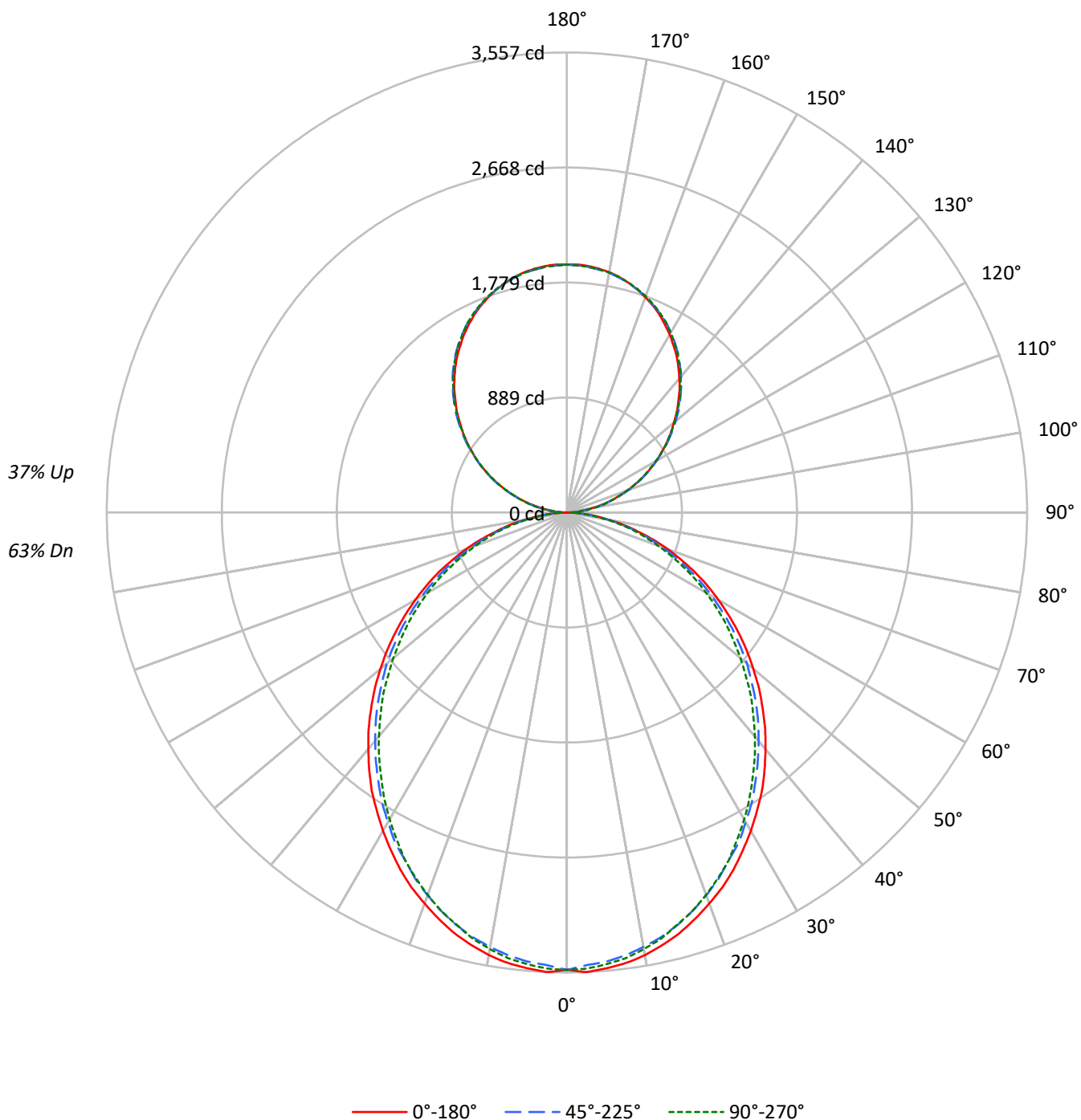
Lumens per Lamp: N/A  
Luminaire Lumens: 14360.3 lumens  
Efficiency: N/A  
Efficacy: 103.3 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 2.96' x L: 3.11' x H: 0.1')  
CIE Type: Semi-Direct

Input Watts (W): 139  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9954  
Total Harmonic Distortion (THDi): 0.076  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT

TEST NUMBER: P908584

CATALOG NUMBER: DFN2DIP-PN3F0-090D060US840-FLLFLL

### Luminous Intensity Polar Plot



TEST NUMBER: P908584

CATALOG NUMBER: DFN2DIP-PN3F0-090D060US840-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   | 110 | 110 | 110 | 110 | 103 | 103 | 103 | 103 | 90 | 90 | 90 | 79 | 79 | 79 | 68 | 68 | 68 |
| 1   | 101 | 96  | 92  | 89  | 94  | 90  | 87  | 84  | 79 | 77 | 74 | 69 | 67 | 66 | 60 | 59 | 57 |
| 2   | 92  | 84  | 78  | 72  | 86  | 79  | 73  | 69  | 70 | 65 | 62 | 61 | 58 | 55 | 53 | 50 | 48 |
| 3   | 84  | 74  | 66  | 60  | 78  | 70  | 63  | 58  | 61 | 56 | 52 | 54 | 50 | 46 | 47 | 44 | 41 |
| 4   | 77  | 66  | 57  | 51  | 71  | 62  | 54  | 49  | 55 | 49 | 44 | 48 | 43 | 40 | 42 | 38 | 35 |
| 5   | 70  | 58  | 50  | 44  | 66  | 55  | 48  | 42  | 49 | 43 | 38 | 43 | 38 | 35 | 38 | 34 | 31 |
| 6   | 65  | 53  | 44  | 38  | 61  | 50  | 42  | 37  | 44 | 38 | 33 | 39 | 34 | 30 | 34 | 30 | 27 |
| 7   | 60  | 48  | 39  | 34  | 56  | 45  | 38  | 32  | 40 | 34 | 30 | 36 | 31 | 27 | 31 | 27 | 24 |
| 8   | 56  | 43  | 35  | 30  | 52  | 41  | 34  | 29  | 37 | 31 | 26 | 33 | 28 | 24 | 29 | 25 | 22 |
| 9   | 52  | 40  | 32  | 27  | 49  | 38  | 30  | 26  | 34 | 28 | 24 | 30 | 25 | 22 | 27 | 23 | 20 |
| 10  | 49  | 36  | 29  | 24  | 46  | 35  | 28  | 23  | 31 | 25 | 21 | 28 | 23 | 20 | 25 | 21 | 18 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 4134 | 4134 | 4134 |
| 5°  | 4138 | 4074 | 4102 |
| 10° | 4102 | 4016 | 4045 |
| 15° | 4040 | 3947 | 3956 |
| 20° | 3955 | 3852 | 3866 |
| 25° | 3872 | 3739 | 3761 |
| 30° | 3768 | 3634 | 3629 |
| 35° | 3669 | 3511 | 3489 |
| 40° | 3547 | 3386 | 3356 |
| 45° | 3426 | 3260 | 3220 |
| 50° | 3294 | 3128 | 3062 |
| 55° | 3155 | 2976 | 2916 |
| 60° | 2997 | 2796 | 2749 |
| 65° | 2825 | 2608 | 2553 |
| 70° | 2606 | 2380 | 2340 |
| 75° | 2304 | 2106 | 2142 |
| 80° | 1937 | 1755 | 1768 |
| 85° | 1366 | 1162 | 1152 |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 3426 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 332.9   | 2.3       |
| 10°-20°   | 936.5   | 6.5       |
| 20°-30°   | 1376.3  | 9.6       |
| 30°-40°   | 1598.5  | 11.1      |
| 40°-50°   | 1596.5  | 11.1      |
| 50°-60°   | 1392.1  | 9.7       |
| 60°-70°   | 1029.1  | 7.2       |
| 70°-80°   | 582.2   | 4.1       |
| 80°-90°   | 159.1   | 1.1       |
| 90°-100°  | 118.6   | 0.8       |
| 100°-110° | 376.8   | 2.6       |
| 110°-120° | 644.8   | 4.5       |
| 120°-130° | 848.0   | 5.9       |
| 130°-140° | 951.8   | 6.6       |
| 140°-150° | 933.4   | 6.5       |
| 150°-160° | 783.0   | 5.5       |
| 160°-170° | 519.2   | 3.6       |
| 170°-180° | 181.5   | 1.3       |
| 0°-30°    | 2645.7  | 18.4      |
| 0°-40°    | 4244.2  | 29.6      |
| 0°-60°    | 7232.9  | 50.4      |
| 0°-90°    | 9003.4  | 62.7      |
| 90°-120°  | 1140.1  | 7.9       |
| 90°-150°  | 3873.3  | 27.0      |
| 90°-180°  | 5357.0  | 37.3      |
| 0°-180°   | 14360.3 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 3536 | 3536  | 3536 | 3536  | 3536 |      |
| 5°   | 3536 | 3523  | 3486 | 3513  | 3506 | 336  |
| 15°  | 3367 | 3346  | 3302 | 3316  | 3299 | 948  |
| 25°  | 3047 | 3020  | 2962 | 2969  | 2962 | 1402 |
| 35°  | 2629 | 2595  | 2540 | 2520  | 2503 | 1642 |
| 45°  | 2139 | 2115  | 2064 | 2027  | 2013 | 1651 |
| 55°  | 1619 | 1598  | 1558 | 1517  | 1500 | 1447 |
| 65°  | 1092 | 1071  | 1037 | 1007  | 990  | 1079 |
| 75°  | 571  | 565   | 547  | 527   | 534  | 610  |
| 85°  | 139  | 136   | 133  | 122   | 119  | 155  |
| 90°  | 2    | 21    | 57   | 53    | 55   | 14   |
| 95°  | 84   | 100   | 103  | 103   | 100  | 94   |
| 105° | 348  | 352   | 356  | 359   | 359  | 367  |
| 115° | 647  | 656   | 653  | 652   | 647  | 640  |
| 125° | 941  | 956   | 951  | 946   | 944  | 841  |
| 135° | 1217 | 1235  | 1239 | 1237  | 1232 | 941  |
| 145° | 1478 | 1489  | 1499 | 1500  | 1494 | 923  |
| 155° | 1690 | 1694  | 1700 | 1708  | 1702 | 778  |
| 165° | 1838 | 1836  | 1836 | 1848  | 1840 | 519  |
| 175° | 1913 | 1908  | 1905 | 1916  | 1906 | 182  |
| 180° | 1916 | 1916  | 1916 | 1916  | 1916 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 3536.4 | 3536.4 | 3536.4 | 3536.4 | 3536.4 |
| 2.5°   | 3557.0 | 3540.1 | 3502.6 | 3536.4 | 3530.0 |
| 5°     | 3536.4 | 3523.1 | 3485.7 | 3512.7 | 3506.2 |
| 7.5°   | 3512.7 | 3492.5 | 3455.0 | 3482.4 | 3475.6 |
| 10°    | 3475.6 | 3451.7 | 3410.9 | 3438.0 | 3427.9 |
| 12.5°  | 3424.3 | 3404.1 | 3363.4 | 3380.2 | 3373.5 |
| 15°    | 3366.6 | 3346.4 | 3302.0 | 3315.7 | 3298.7 |
| 17.5°  | 3295.1 | 3274.9 | 3230.6 | 3247.5 | 3230.6 |
| 20°    | 3216.8 | 3196.6 | 3149.0 | 3159.1 | 3145.7 |
| 22.5°  | 3138.9 | 3108.3 | 3063.8 | 3063.8 | 3057.0 |
| 25°    | 3046.9 | 3019.8 | 2962.1 | 2968.6 | 2962.1 |
| 27.5°  | 2944.8 | 2920.9 | 2877.0 | 2866.9 | 2849.9 |
| 30°    | 2843.1 | 2815.6 | 2764.7 | 2754.6 | 2741.0 |
| 32.5°  | 2734.1 | 2713.9 | 2659.4 | 2638.9 | 2625.1 |
| 35°    | 2628.8 | 2594.8 | 2540.3 | 2519.8 | 2502.9 |
| 37.5°  | 2509.7 | 2479.0 | 2424.5 | 2400.8 | 2383.8 |
| 40°    | 2387.3 | 2360.0 | 2305.4 | 2275.1 | 2261.5 |
| 42.5°  | 2268.3 | 2240.9 | 2186.8 | 2152.5 | 2132.3 |
| 45°    | 2139.1 | 2115.4 | 2064.1 | 2026.9 | 2013.3 |
| 47.5°  | 2013.3 | 1989.4 | 1934.9 | 1897.4 | 1877.2 |
| 50°    | 1880.5 | 1863.5 | 1815.8 | 1768.3 | 1751.3 |
| 52.5°  | 1751.3 | 1727.5 | 1683.4 | 1646.0 | 1622.1 |
| 55°    | 1618.9 | 1598.3 | 1557.5 | 1516.8 | 1499.9 |
| 57.5°  | 1486.1 | 1469.2 | 1424.8 | 1384.0 | 1370.3 |
| 60°    | 1353.3 | 1340.0 | 1292.3 | 1254.9 | 1244.8 |
| 62.5°  | 1224.2 | 1200.3 | 1166.4 | 1132.6 | 1118.8 |
| 65°    | 1091.8 | 1071.2 | 1037.2 | 1006.6 | 989.7  |
| 67.5°  | 955.7  | 938.5  | 908.1  | 884.3  | 870.6  |
| 70°    | 829.8  | 816.1  | 785.5  | 761.6  | 748.3  |
| 72.5°  | 700.6  | 686.9  | 669.9  | 646.2  | 636.1  |
| 75°    | 571.2  | 564.6  | 547.3  | 527.1  | 534.0  |
| 77.5°  | 455.7  | 442.0  | 435.2  | 425.1  | 415.0  |
| 80°    | 340.2  | 336.6  | 329.7  | 319.6  | 312.9  |
| 82.5°  | 231.3  | 231.3  | 228.0  | 214.3  | 214.3  |
| 85°    | 139.3  | 136.0  | 132.8  | 122.3  | 119.1  |
| 87.5°  | 61.3   | 54.4   | 47.7   | 37.6   | 33.9   |
| 90°    | 1.7    | 20.8   | 56.7   | 53.1   | 54.8   |
| 92.5°  | 35.9   | 48.6   | 50.3   | 52.0   | 52.0   |
| 95°    | 84.3   | 100.5  | 103.4  | 103.4  | 100.5  |
| 97.5°  | 140.4  | 155.4  | 161.8  | 161.8  | 161.8  |
| 100°   | 205.1  | 218.3  | 223.0  | 223.0  | 221.3  |
| 102.5° | 273.3  | 283.1  | 289.4  | 291.1  | 289.4  |
| 105°   | 347.8  | 352.4  | 355.9  | 358.8  | 358.8  |
| 107.5° | 421.7  | 428.7  | 428.7  | 429.8  | 421.7  |
| 110°   | 493.4  | 502.6  | 502.6  | 502.6  | 498.0  |



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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 570.8  | 580.6  | 578.9  | 574.2  | 570.8  |
| 115°   | 647.0  | 656.3  | 653.4  | 651.7  | 647.0  |
| 117.5° | 722.8  | 735.5  | 727.3  | 722.8  | 718.1  |
| 120°   | 799.0  | 811.7  | 799.0  | 799.0  | 793.8  |
| 122.5° | 868.3  | 884.4  | 876.4  | 871.8  | 868.3  |
| 125°   | 941.1  | 955.5  | 950.9  | 945.7  | 944.0  |
| 127.5° | 1012.2 | 1030.1 | 1023.7 | 1016.8 | 1012.2 |
| 130°   | 1078.6 | 1099.4 | 1096.5 | 1093.1 | 1086.7 |
| 132.5° | 1153.2 | 1169.3 | 1170.4 | 1162.4 | 1157.7 |
| 135°   | 1217.3 | 1235.2 | 1238.6 | 1236.9 | 1232.2 |
| 137.5° | 1288.9 | 1303.3 | 1306.3 | 1305.0 | 1298.2 |
| 140°   | 1351.9 | 1366.3 | 1374.4 | 1374.4 | 1368.1 |
| 142.5° | 1416.5 | 1431.0 | 1435.6 | 1437.3 | 1431.0 |
| 145°   | 1477.8 | 1489.3 | 1498.6 | 1500.4 | 1494.0 |
| 147.5° | 1532.7 | 1547.1 | 1554.1 | 1556.9 | 1550.5 |
| 150°   | 1589.3 | 1599.1 | 1605.5 | 1610.6 | 1605.5 |
| 152.5° | 1639.5 | 1649.4 | 1657.5 | 1663.9 | 1657.5 |
| 155°   | 1689.8 | 1694.5 | 1699.6 | 1707.8 | 1702.5 |
| 157.5° | 1733.1 | 1736.7 | 1739.5 | 1751.1 | 1743.0 |
| 160°   | 1771.9 | 1775.3 | 1777.1 | 1786.9 | 1780.0 |
| 162.5° | 1807.7 | 1807.7 | 1809.4 | 1820.4 | 1812.3 |
| 165°   | 1838.3 | 1836.5 | 1836.5 | 1848.2 | 1840.1 |
| 167.5° | 1866.0 | 1860.9 | 1860.9 | 1872.4 | 1864.3 |
| 170°   | 1886.8 | 1882.2 | 1880.5 | 1892.0 | 1882.2 |
| 172.5° | 1901.3 | 1896.6 | 1894.9 | 1906.4 | 1896.6 |
| 175°   | 1912.8 | 1908.2 | 1904.7 | 1916.3 | 1906.4 |
| 177.5° | 1919.1 | 1914.6 | 1911.1 | 1920.9 | 1911.1 |
| 180°   | 1916.3 | 1916.3 | 1916.3 | 1916.3 | 1916.3 |

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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 | 13.26            | 14.25 | 14.10 | 15.11 | 16.19 | 12.82          | 13.81 | 13.66 | 14.67 | 15.75 |
|                 | 3H   | 14.92            | 15.81 | 15.77 | 16.68 | 17.79 | 14.44          | 15.33 | 15.29 | 16.20 | 17.30 |
|                 | 4H   | 15.51            | 16.35 | 16.38 | 17.23 | 18.34 | 15.03          | 15.87 | 15.90 | 16.74 | 17.86 |
|                 | 6H   | 15.91            | 16.69 | 16.79 | 17.57 | 18.70 | 15.42          | 16.20 | 16.30 | 17.08 | 18.21 |
|                 | 8H   | 16.02            | 16.76 | 16.91 | 17.66 | 18.79 | 15.53          | 16.27 | 16.42 | 17.17 | 18.30 |
|                 | 12H  | 16.07            | 16.77 | 16.96 | 17.67 | 18.82 | 15.57          | 16.27 | 16.47 | 17.17 | 18.33 |
| 4H              | 2H   | 13.73            | 14.57 | 14.60 | 15.45 | 16.56 | 13.38          | 14.22 | 14.25 | 15.10 | 16.21 |
|                 | 3H   | 15.60            | 16.30 | 16.49 | 17.21 | 18.34 | 15.20          | 15.90 | 16.08 | 16.81 | 17.94 |
|                 | 4H   | 16.32            | 16.95 | 17.21 | 17.86 | 19.02 | 15.90          | 16.54 | 16.80 | 17.44 | 18.60 |
|                 | 6H   | 16.83            | 17.38 | 17.74 | 18.31 | 19.47 | 16.41          | 16.96 | 17.32 | 17.89 | 19.05 |
|                 | 8H   | 16.98            | 17.50 | 17.90 | 18.42 | 19.59 | 16.56          | 17.07 | 17.47 | 18.00 | 19.17 |
|                 | 12H  | 17.06            | 17.52 | 17.99 | 18.47 | 19.64 | 16.62          | 17.09 | 17.56 | 18.03 | 19.21 |
| 8H              | 4H   | 16.52            | 17.03 | 17.43 | 17.96 | 19.13 | 16.15          | 16.66 | 17.06 | 17.59 | 18.76 |
|                 | 6H   | 17.15            | 17.57 | 18.09 | 18.54 | 19.71 | 16.77          | 17.20 | 17.71 | 18.17 | 19.34 |
|                 | 8H   | 17.37            | 17.74 | 18.32 | 18.70 | 19.89 | 16.98          | 17.36 | 17.93 | 18.32 | 19.51 |
|                 | 12H  | 17.50            | 17.83 | 18.45 | 18.78 | 20.02 | 17.10          | 17.43 | 18.05 | 18.38 | 19.62 |
| 12H             | 4H   | 16.51            | 16.97 | 17.44 | 17.92 | 19.10 | 16.15          | 16.61 | 17.08 | 17.56 | 18.73 |
|                 | 6H   | 17.18            | 17.56 | 18.13 | 18.51 | 19.70 | 16.81          | 17.19 | 17.76 | 18.15 | 19.34 |
|                 | 8H   | 17.42            | 17.75 | 18.37 | 18.70 | 19.94 | 17.05          | 17.38 | 18.00 | 18.33 | 19.57 |