

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: P909990

Luminaire Tested: DFN2DIP-TR3F0-090D070US840-RLFL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P909990  
REPORT IS A COMBINATION OF REPORTS P900340 AND P897195  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-TR3F0-090D070US840-RLLFLL  
Description: 3 foot, Triangle Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

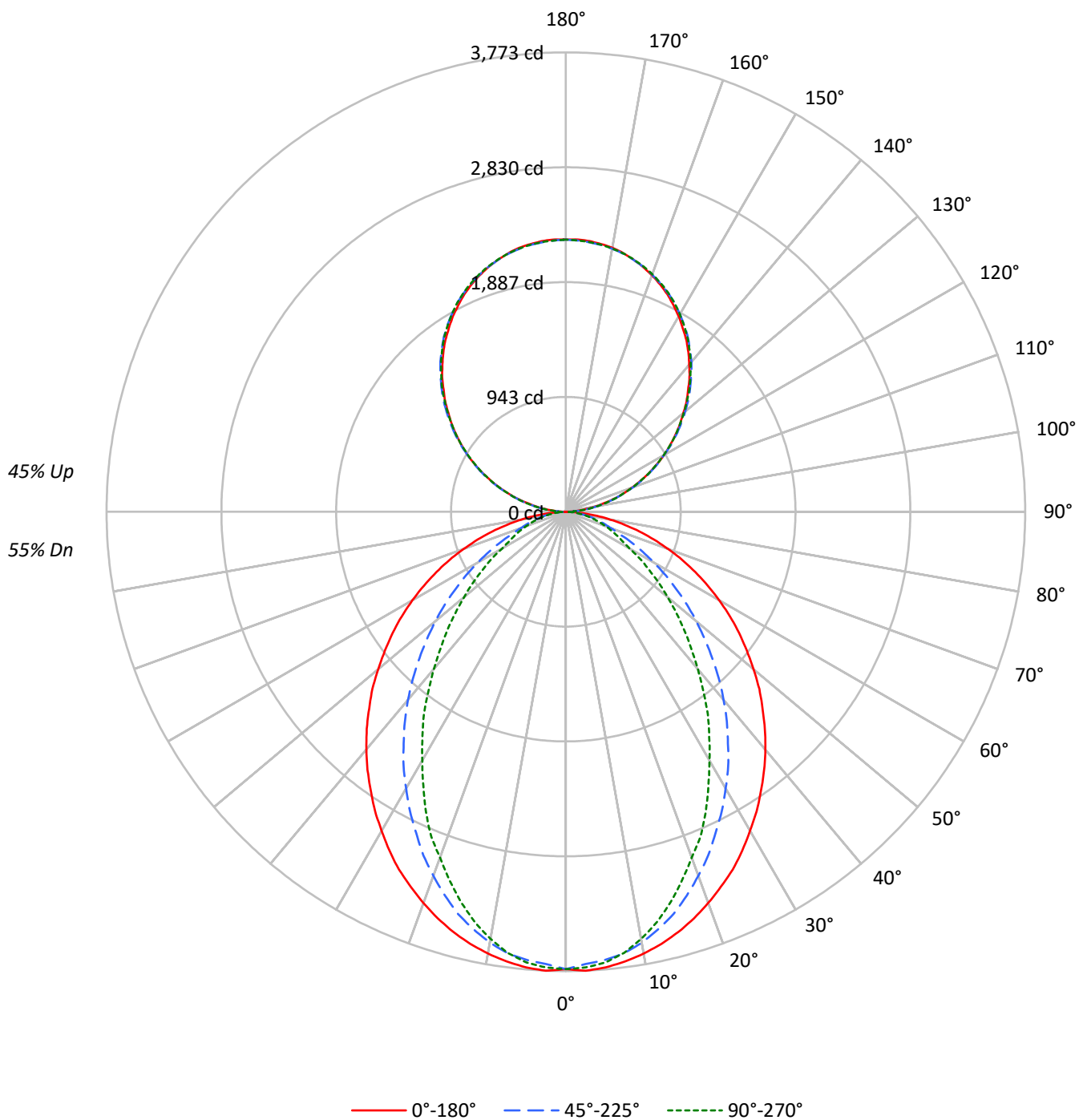
**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 13981.6 lumens  
Efficiency: N/A  
Efficacy: 94.4 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 0.99 / 1.16  
Luminous Opening: Rectangular w/ Sides (W: 2.74' x L: 3.16' x H: 0.1')  
CIE Type: General Diffuse  
  
Input Watts (W): 148.1  
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



TEST NUMBER: P909990

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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   | 108 | 108 | 108 | 108 | 101 | 101 | 101 | 101 | 86 | 86 | 86 | 73 | 73 | 73 | 61 | 61 | 61 |
| 1   | 99  | 95  | 92  | 88  | 92  | 89  | 86  | 83  | 76 | 74 | 72 | 65 | 63 | 62 | 55 | 54 | 53 |
| 2   | 91  | 84  | 78  | 73  | 84  | 78  | 73  | 69  | 68 | 64 | 60 | 58 | 55 | 53 | 49 | 47 | 45 |
| 3   | 83  | 74  | 67  | 61  | 77  | 69  | 63  | 58  | 60 | 55 | 51 | 52 | 48 | 45 | 44 | 41 | 39 |
| 4   | 77  | 66  | 58  | 52  | 71  | 62  | 55  | 50  | 54 | 49 | 44 | 46 | 42 | 39 | 39 | 36 | 34 |
| 5   | 71  | 59  | 51  | 45  | 65  | 55  | 48  | 43  | 48 | 43 | 39 | 42 | 38 | 34 | 36 | 33 | 30 |
| 6   | 65  | 53  | 45  | 40  | 60  | 50  | 43  | 38  | 44 | 38 | 34 | 38 | 34 | 30 | 33 | 29 | 27 |
| 7   | 60  | 48  | 41  | 35  | 56  | 45  | 38  | 33  | 40 | 34 | 30 | 35 | 30 | 27 | 30 | 27 | 24 |
| 8   | 56  | 44  | 36  | 31  | 52  | 41  | 35  | 30  | 37 | 31 | 27 | 32 | 28 | 24 | 28 | 24 | 22 |
| 9   | 52  | 40  | 33  | 28  | 49  | 38  | 31  | 27  | 34 | 28 | 24 | 30 | 25 | 22 | 26 | 22 | 20 |
| 10  | 49  | 37  | 30  | 25  | 46  | 35  | 29  | 24  | 31 | 26 | 22 | 27 | 23 | 20 | 24 | 20 | 18 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 4681 | 4681 | 4681 |
| 5°  | 4686 | 4603 | 4633 |
| 10° | 4637 | 4508 | 4479 |
| 15° | 4570 | 4356 | 4243 |
| 20° | 4483 | 4147 | 3955 |
| 25° | 4394 | 3913 | 3676 |
| 30° | 4275 | 3674 | 3324 |
| 35° | 4159 | 3417 | 3015 |
| 40° | 4040 | 3151 | 2661 |
| 45° | 3902 | 2858 | 2340 |
| 50° | 3760 | 2561 | 2027 |
| 55° | 3610 | 2245 | 1727 |
| 60° | 3437 | 1915 | 1418 |
| 65° | 3238 | 1581 | 1273 |
| 70° | 2997 | 1268 | 1148 |
| 75° | 2693 | 1110 | 1038 |
| 80° | 2253 | 918  | 890  |
| 85° | 1533 | 594  | 650  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 3902 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 352.1   | 2.5       |
| 10°-20°   | 966.5   | 6.9       |
| 20°-30°   | 1356.9  | 9.7       |
| 30°-40°   | 1479.1  | 10.6      |
| 40°-50°   | 1359.4  | 9.7       |
| 50°-60°   | 1067.6  | 7.6       |
| 60°-70°   | 694.9   | 5.0       |
| 70°-80°   | 357.7   | 2.6       |
| 80°-90°   | 97.7    | 0.7       |
| 90°-100°  | 138.3   | 1.0       |
| 100°-110° | 439.6   | 3.1       |
| 110°-120° | 752.2   | 5.4       |
| 120°-130° | 989.3   | 7.1       |
| 130°-140° | 1110.5  | 7.9       |
| 140°-150° | 1088.9  | 7.8       |
| 150°-160° | 913.5   | 6.5       |
| 160°-170° | 605.8   | 4.3       |
| 170°-180° | 211.7   | 1.5       |
| 0°-30°    | 2675.4  | 19.1      |
| 0°-40°    | 4154.5  | 29.7      |
| 0°-60°    | 6581.5  | 47.1      |
| 0°-90°    | 7731.8  | 55.3      |
| 90°-120°  | 1330.1  | 9.5       |
| 90°-150°  | 4518.8  | 32.3      |
| 90°-180°  | 6250.0  | 44.7      |
| 0°-180°   | 13981.6 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 3756 | 3756  | 3756 | 3756  | 3756 |      |
| 5°   | 3756 | 3739  | 3695 | 3726  | 3716 | 356  |
| 15°  | 3573 | 3535  | 3420 | 3355  | 3321 | 1007 |
| 25°  | 3243 | 3134  | 2910 | 2771  | 2720 | 1492 |
| 35°  | 2794 | 2621  | 2322 | 2108  | 2033 | 1749 |
| 45°  | 2284 | 2057  | 1700 | 1458  | 1377 | 1764 |
| 55°  | 1737 | 1472  | 1105 | 901   | 836  | 1552 |
| 65°  | 1173 | 897   | 592  | 476   | 466  | 1163 |
| 75°  | 625  | 387   | 272  | 248   | 245  | 661  |
| 85°  | 146  | 75    | 64   | 64    | 64   | 168  |
| 90°  | 2    | 24    | 66   | 62    | 64   | 14   |
| 95°  | 98   | 117   | 121  | 121   | 117  | 109  |
| 105° | 406  | 411   | 415  | 419   | 419  | 428  |
| 115° | 755  | 766   | 762  | 760   | 755  | 747  |
| 125° | 1098 | 1115  | 1109 | 1103  | 1101 | 981  |
| 135° | 1420 | 1441  | 1445 | 1443  | 1438 | 1098 |
| 145° | 1724 | 1738  | 1748 | 1750  | 1743 | 1077 |
| 155° | 1972 | 1977  | 1983 | 1992  | 1986 | 907  |
| 165° | 2145 | 2143  | 2143 | 2156  | 2147 | 605  |
| 175° | 2232 | 2226  | 2222 | 2236  | 2224 | 212  |
| 180° | 2236 | 2236  | 2236 | 2236  | 2236 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 3756.4 | 3756.4 | 3756.4 | 3756.4 | 3756.4 |
| 2.5°   | 3773.4 | 3756.4 | 3718.8 | 3753.2 | 3746.3 |
| 5°     | 3756.4 | 3739.4 | 3695.1 | 3725.7 | 3715.6 |
| 7.5°   | 3725.7 | 3705.5 | 3657.9 | 3671.3 | 3654.3 |
| 10°    | 3685.0 | 3661.2 | 3593.4 | 3582.9 | 3562.7 |
| 12.5°  | 3634.1 | 3603.5 | 3511.5 | 3491.3 | 3453.7 |
| 15°    | 3572.8 | 3535.3 | 3419.9 | 3355.3 | 3321.4 |
| 17.5°  | 3501.4 | 3447.0 | 3304.1 | 3229.4 | 3175.0 |
| 20°    | 3419.9 | 3351.7 | 3181.8 | 3097.1 | 3022.0 |
| 22.5°  | 3331.5 | 3253.3 | 3056.0 | 2940.5 | 2889.7 |
| 25°    | 3243.2 | 3134.2 | 2909.9 | 2770.7 | 2719.5 |
| 27.5°  | 3137.9 | 3022.0 | 2773.9 | 2614.1 | 2535.9 |
| 30°    | 3025.7 | 2896.2 | 2624.2 | 2451.1 | 2359.1 |
| 32.5°  | 2916.7 | 2760.2 | 2481.7 | 2277.7 | 2192.5 |
| 35°    | 2794.5 | 2621.0 | 2322.0 | 2107.8 | 2032.8 |
| 37.5°  | 2675.4 | 2488.3 | 2172.3 | 1937.5 | 1852.8 |
| 40°    | 2549.6 | 2345.8 | 2015.8 | 1774.5 | 1686.2 |
| 42.5°  | 2420.4 | 2203.0 | 1859.6 | 1607.9 | 1523.1 |
| 45°    | 2284.5 | 2056.6 | 1699.8 | 1458.1 | 1376.6 |
| 47.5°  | 2155.4 | 1914.1 | 1546.9 | 1305.3 | 1230.6 |
| 50°    | 2012.6 | 1771.2 | 1397.2 | 1162.5 | 1091.4 |
| 52.5°  | 1873.0 | 1618.0 | 1254.5 | 1030.1 | 965.5  |
| 55°    | 1737.0 | 1471.9 | 1104.7 | 901.0  | 836.4  |
| 57.5°  | 1597.8 | 1325.9 | 972.4  | 781.9  | 727.5  |
| 60°    | 1454.9 | 1183.0 | 832.8  | 659.6  | 605.2  |
| 62.5°  | 1315.8 | 1043.8 | 713.8  | 550.8  | 523.7  |
| 65°    | 1172.9 | 897.4  | 591.5  | 476.1  | 465.6  |
| 67.5°  | 1036.9 | 761.3  | 476.1  | 418.0  | 407.9  |
| 70°    | 894.1  | 629.0  | 394.3  | 360.3  | 346.6  |
| 72.5°  | 758.1  | 506.3  | 329.6  | 302.6  | 295.8  |
| 75°    | 625.4  | 387.4  | 272.0  | 248.1  | 244.9  |
| 77.5°  | 493.0  | 275.2  | 214.2  | 200.6  | 193.7  |
| 80°    | 370.4  | 197.3  | 163.0  | 149.7  | 149.7  |
| 82.5°  | 258.2  | 132.7  | 112.2  | 105.3  | 105.3  |
| 85°    | 146.0  | 74.6   | 64.5   | 64.5   | 64.5   |
| 87.5°  | 54.4   | 27.1   | 27.1   | 23.8   | 23.8   |
| 90°    | 2.0    | 24.2   | 66.0   | 62.0   | 64.0   |
| 92.5°  | 41.8   | 56.7   | 58.7   | 60.7   | 60.7   |
| 95°    | 98.4   | 117.2  | 120.7  | 120.7  | 117.2  |
| 97.5°  | 163.8  | 181.3  | 188.7  | 188.7  | 188.7  |
| 100°   | 239.2  | 254.8  | 260.1  | 260.1  | 258.1  |
| 102.5° | 318.8  | 330.2  | 337.7  | 339.7  | 337.7  |
| 105°   | 405.8  | 411.1  | 415.2  | 418.6  | 418.6  |
| 107.5° | 492.0  | 500.1  | 500.1  | 501.5  | 492.0  |
| 110°   | 575.6  | 586.4  | 586.4  | 586.4  | 581.0  |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 665.9  | 677.4  | 675.4  | 669.9  | 665.9  |
| 115°   | 754.9  | 765.7  | 762.3  | 760.3  | 754.9  |
| 117.5° | 843.1  | 858.0  | 848.6  | 843.1  | 837.8  |
| 120°   | 932.1  | 947.0  | 932.1  | 932.1  | 926.0  |
| 122.5° | 1013.0 | 1031.9 | 1022.5 | 1017.0 | 1013.0 |
| 125°   | 1097.9 | 1114.8 | 1109.4 | 1103.4 | 1101.4 |
| 127.5° | 1180.8 | 1201.7 | 1194.4 | 1186.3 | 1180.8 |
| 130°   | 1258.4 | 1282.6 | 1279.3 | 1275.3 | 1267.8 |
| 132.5° | 1345.3 | 1364.2 | 1365.5 | 1356.1 | 1350.7 |
| 135°   | 1420.2 | 1441.0 | 1445.1 | 1443.0 | 1437.6 |
| 137.5° | 1503.7 | 1520.6 | 1523.9 | 1522.6 | 1514.5 |
| 140°   | 1577.2 | 1594.1 | 1603.5 | 1603.5 | 1596.1 |
| 142.5° | 1652.6 | 1669.5 | 1674.9 | 1676.9 | 1669.5 |
| 145°   | 1724.1 | 1737.6 | 1748.4 | 1750.4 | 1743.0 |
| 147.5° | 1788.2 | 1805.0 | 1813.1 | 1816.4 | 1809.1 |
| 150°   | 1854.2 | 1865.6 | 1873.1 | 1879.2 | 1873.1 |
| 152.5° | 1912.8 | 1924.3 | 1933.7 | 1941.2 | 1933.7 |
| 155°   | 1971.5 | 1976.8 | 1983.0 | 1992.4 | 1986.3 |
| 157.5° | 2022.1 | 2026.1 | 2029.4 | 2043.0 | 2033.5 |
| 160°   | 2067.2 | 2071.2 | 2073.3 | 2084.7 | 2076.6 |
| 162.5° | 2109.0 | 2109.0 | 2111.0 | 2123.7 | 2114.4 |
| 165°   | 2144.7 | 2142.6 | 2142.6 | 2156.2 | 2146.7 |
| 167.5° | 2177.1 | 2171.0 | 2171.0 | 2184.4 | 2175.0 |
| 170°   | 2201.3 | 2196.0 | 2193.9 | 2207.4 | 2196.0 |
| 172.5° | 2218.2 | 2212.7 | 2210.7 | 2224.2 | 2212.7 |
| 175°   | 2231.6 | 2226.2 | 2222.2 | 2235.6 | 2224.2 |
| 177.5° | 2239.1 | 2233.6 | 2229.6 | 2241.1 | 2229.6 |
| 180°   | 2235.6 | 2235.6 | 2235.6 | 2235.6 | 2235.6 |

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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 | 12.94            | 13.81 | 13.86 | 14.74 | 15.94 | 8.91           | 9.79  | 9.83  | 10.72 | 11.92 |
|                 | 3H   | 14.61            | 15.39 | 15.54 | 16.33 | 17.55 | 10.10          | 10.88 | 11.03 | 11.82 | 13.05 |
|                 | 4H   | 15.21            | 15.95 | 16.16 | 16.90 | 18.13 | 10.55          | 11.29 | 11.49 | 12.23 | 13.46 |
|                 | 6H   | 15.63            | 16.31 | 16.59 | 17.26 | 18.50 | 10.87          | 11.55 | 11.82 | 12.50 | 13.74 |
|                 | 8H   | 15.75            | 16.40 | 16.72 | 17.37 | 18.61 | 10.96          | 11.61 | 11.92 | 12.57 | 13.81 |
|                 | 12H  | 15.81            | 16.43 | 16.78 | 17.39 | 18.65 | 11.00          | 11.62 | 11.97 | 12.58 | 13.84 |
| 4H              | 2H   | 12.96            | 13.70 | 13.91 | 14.65 | 15.88 | 9.51           | 10.25 | 10.46 | 11.20 | 12.43 |
|                 | 3H   | 14.78            | 15.40 | 15.74 | 16.37 | 17.62 | 10.86          | 11.47 | 11.82 | 12.45 | 13.69 |
|                 | 4H   | 15.47            | 16.03 | 16.44 | 17.00 | 18.27 | 11.40          | 11.96 | 12.37 | 12.93 | 14.20 |
|                 | 6H   | 15.98            | 16.46 | 16.96 | 17.45 | 18.72 | 11.82          | 12.30 | 12.80 | 13.29 | 14.56 |
|                 | 8H   | 16.15            | 16.60 | 17.13 | 17.59 | 18.87 | 11.95          | 12.40 | 12.93 | 13.38 | 14.66 |
|                 | 12H  | 16.24            | 16.65 | 17.24 | 17.65 | 18.94 | 12.01          | 12.41 | 13.01 | 13.42 | 14.70 |
| 8H              | 4H   | 15.44            | 15.89 | 16.42 | 16.88 | 18.16 | 11.68          | 12.13 | 12.66 | 13.12 | 14.40 |
|                 | 6H   | 16.00            | 16.37 | 17.00 | 17.40 | 18.68 | 12.19          | 12.56 | 13.20 | 13.59 | 14.87 |
|                 | 8H   | 16.21            | 16.54 | 17.22 | 17.55 | 18.85 | 12.38          | 12.71 | 13.40 | 13.72 | 15.02 |
|                 | 12H  | 16.34            | 16.63 | 17.36 | 17.64 | 18.98 | 12.50          | 12.78 | 13.51 | 13.79 | 15.14 |
| 12H             | 4H   | 15.39            | 15.80 | 16.39 | 16.80 | 18.09 | 11.69          | 12.09 | 12.69 | 13.10 | 14.38 |
|                 | 6H   | 15.97            | 16.30 | 16.99 | 17.32 | 18.61 | 12.24          | 12.57 | 13.26 | 13.58 | 14.88 |
|                 | 8H   | 16.19            | 16.48 | 17.21 | 17.49 | 18.83 | 12.45          | 12.74 | 13.47 | 13.75 | 15.09 |