

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: P917450

Luminaire Tested: DFN2DIP-SQ3F0-090D080US930-RLLFLL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P917450  
REPORT IS A COMBINATION OF REPORTS P899944 AND P896733  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-SQ3F0-090D080US930-RLLFLL  
Description: 3 foot, Square Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

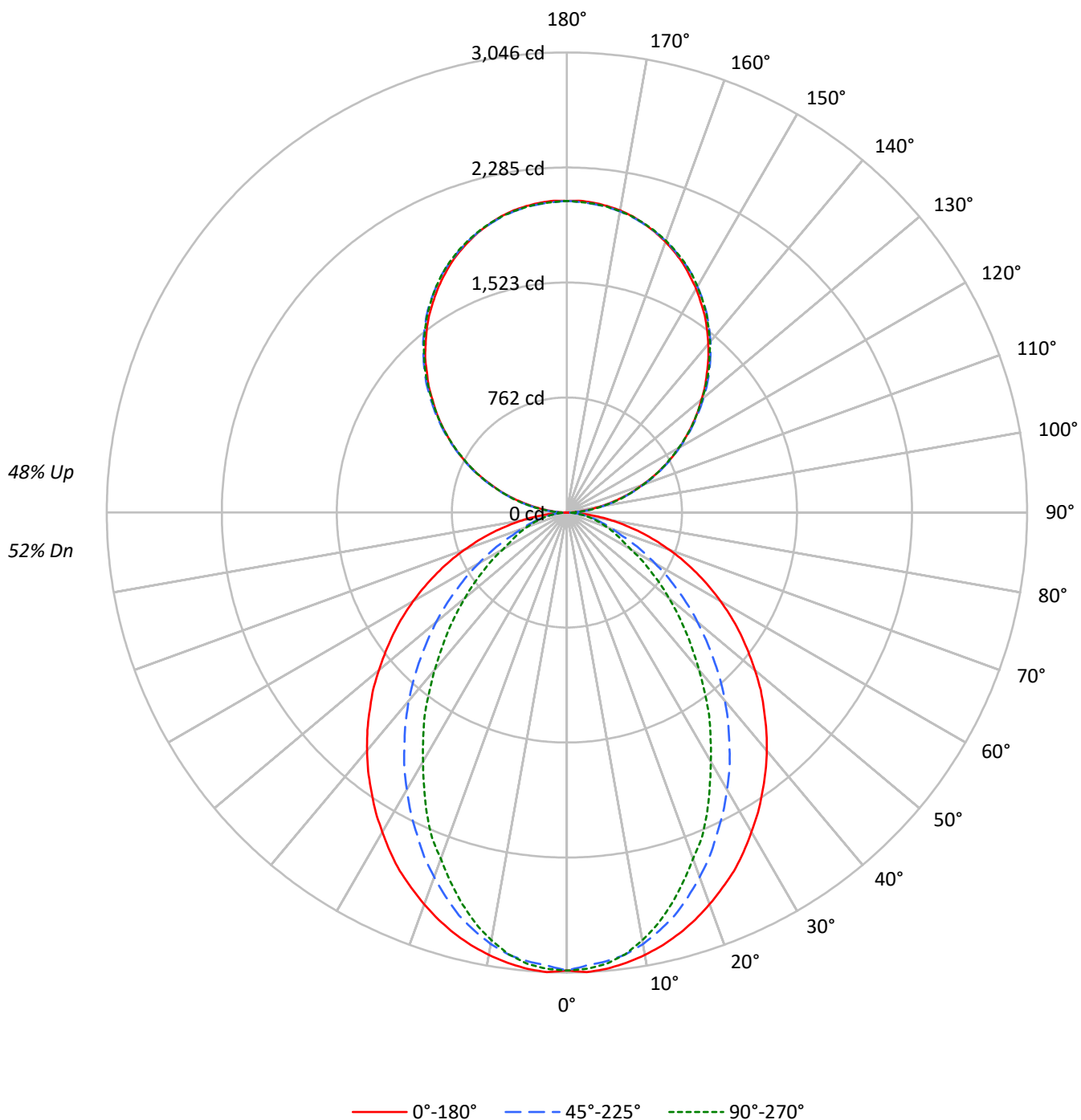
Lumens per Lamp: N/A  
Luminaire Lumens: 12009.4 lumens  
Efficiency: N/A  
Efficacy: 81.0 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 0.99 / 1.16  
Luminous Opening: Rectangular w/ Sides (W: 3.06' x L: 3.06' x H: 0.1')  
CIE Type: General Diffuse

Input Watts (W): 148.2  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.996  
Total Harmonic Distortion (THDi): 0.064  
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: P917450

CATALOG NUMBER: DFN2DIP-SQ3F0-090D080US930-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   | 108 | 108 | 108 | 108 | 100 | 100 | 100 | 100 | 84 | 84 | 84 | 71 | 71 | 71 | 58 | 58 | 58 |
| 1   | 99  | 95  | 91  | 88  | 91  | 88  | 84  | 82  | 75 | 72 | 70 | 63 | 61 | 60 | 52 | 51 | 50 |
| 2   | 90  | 83  | 77  | 72  | 83  | 77  | 72  | 68  | 66 | 62 | 59 | 56 | 53 | 51 | 46 | 44 | 43 |
| 3   | 83  | 74  | 66  | 61  | 76  | 68  | 62  | 57  | 59 | 54 | 50 | 50 | 46 | 44 | 42 | 39 | 37 |
| 4   | 76  | 65  | 58  | 52  | 70  | 61  | 54  | 49  | 53 | 47 | 43 | 45 | 41 | 38 | 37 | 35 | 32 |
| 5   | 70  | 59  | 51  | 45  | 65  | 55  | 48  | 42  | 47 | 42 | 38 | 40 | 36 | 33 | 34 | 31 | 28 |
| 6   | 65  | 53  | 45  | 39  | 60  | 49  | 42  | 37  | 43 | 37 | 33 | 37 | 32 | 29 | 31 | 28 | 25 |
| 7   | 60  | 48  | 40  | 35  | 55  | 45  | 38  | 33  | 39 | 33 | 29 | 34 | 29 | 26 | 28 | 25 | 23 |
| 8   | 56  | 44  | 36  | 31  | 51  | 41  | 34  | 29  | 36 | 30 | 26 | 31 | 27 | 23 | 26 | 23 | 21 |
| 9   | 52  | 40  | 33  | 28  | 48  | 37  | 31  | 26  | 33 | 27 | 24 | 28 | 24 | 21 | 24 | 21 | 19 |
| 10  | 49  | 37  | 30  | 25  | 45  | 34  | 28  | 24  | 30 | 25 | 21 | 26 | 22 | 19 | 23 | 19 | 17 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 3475 | 3475 | 3475 |
| 5°  | 3478 | 3417 | 3440 |
| 10° | 3442 | 3348 | 3327 |
| 15° | 3392 | 3235 | 3153 |
| 20° | 3327 | 3080 | 2940 |
| 25° | 3261 | 2908 | 2734 |
| 30° | 3172 | 2730 | 2473 |
| 35° | 3085 | 2540 | 2244 |
| 40° | 2997 | 2343 | 1982 |
| 45° | 2894 | 2126 | 1744 |
| 50° | 2788 | 1906 | 1512 |
| 55° | 2677 | 1672 | 1289 |
| 60° | 2548 | 1427 | 1060 |
| 65° | 2399 | 1178 | 952  |
| 70° | 2219 | 946  | 860  |
| 75° | 1993 | 829  | 780  |
| 80° | 1665 | 688  | 673  |
| 85° | 1129 | 448  | 499  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 2894 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 284.2   | 2.4       |
| 10°-20°   | 780.3   | 6.5       |
| 20°-30°   | 1095.5  | 9.1       |
| 30°-40°   | 1194.1  | 9.9       |
| 40°-50°   | 1097.5  | 9.1       |
| 50°-60°   | 861.9   | 7.2       |
| 60°-70°   | 561.0   | 4.7       |
| 70°-80°   | 288.8   | 2.4       |
| 80°-90°   | 79.6    | 0.7       |
| 90°-100°  | 127.6   | 1.1       |
| 100°-110° | 405.6   | 3.4       |
| 110°-120° | 694.1   | 5.8       |
| 120°-130° | 912.8   | 7.6       |
| 130°-140° | 1024.6  | 8.5       |
| 140°-150° | 1004.7  | 8.4       |
| 150°-160° | 842.8   | 7.0       |
| 160°-170° | 558.9   | 4.7       |
| 170°-180° | 195.4   | 1.6       |
| 0°-30°    | 2159.9  | 18.0      |
| 0°-40°    | 3354.0  | 27.9      |
| 0°-60°    | 5313.5  | 44.2      |
| 0°-90°    | 6242.9  | 52.0      |
| 90°-120°  | 1227.3  | 10.2      |
| 90°-150°  | 4169.4  | 34.7      |
| 90°-180°  | 5766.0  | 48.0      |
| 0°-180°   | 12009.4 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 3033 | 3033  | 3033 | 3033  | 3033 |      |
| 5°   | 3033 | 3019  | 2983 | 3008  | 3000 | 288  |
| 15°  | 2884 | 2854  | 2761 | 2709  | 2682 | 813  |
| 25°  | 2618 | 2530  | 2349 | 2237  | 2196 | 1204 |
| 35°  | 2256 | 2116  | 1875 | 1702  | 1641 | 1412 |
| 45°  | 1844 | 1660  | 1372 | 1177  | 1111 | 1424 |
| 55°  | 1402 | 1188  | 892  | 727   | 675  | 1253 |
| 65°  | 947  | 724   | 478  | 384   | 376  | 939  |
| 75°  | 505  | 313   | 220  | 200   | 198  | 534  |
| 85°  | 118  | 60    | 52   | 52    | 52   | 135  |
| 90°  | 2    | 22    | 61   | 57    | 59   | 12   |
| 95°  | 91   | 108   | 111  | 111   | 108  | 101  |
| 105° | 374  | 379   | 383  | 386   | 386  | 395  |
| 115° | 696  | 706   | 703  | 702   | 696  | 689  |
| 125° | 1013 | 1029  | 1024 | 1018  | 1016 | 905  |
| 135° | 1310 | 1330  | 1333 | 1332  | 1326 | 1013 |
| 145° | 1591 | 1603  | 1613 | 1615  | 1608 | 994  |
| 155° | 1819 | 1824  | 1830 | 1838  | 1833 | 837  |
| 165° | 1979 | 1977  | 1977 | 1989  | 1981 | 558  |
| 175° | 2059 | 2054  | 2050 | 2063  | 2052 | 196  |
| 180° | 2063 | 2063  | 2063 | 2063  | 2063 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 3032.7 | 3032.7 | 3032.7 | 3032.7 | 3032.7 |
| 2.5°   | 3046.4 | 3032.7 | 3002.3 | 3030.1 | 3024.5 |
| 5°     | 3032.7 | 3019.0 | 2983.2 | 3007.9 | 2999.7 |
| 7.5°   | 3007.9 | 2991.6 | 2953.2 | 2963.9 | 2950.2 |
| 10°    | 2975.0 | 2955.8 | 2901.1 | 2892.6 | 2876.3 |
| 12.5°  | 2933.9 | 2909.2 | 2835.0 | 2818.6 | 2788.3 |
| 15°    | 2884.4 | 2854.2 | 2761.0 | 2708.8 | 2681.5 |
| 17.5°  | 2826.8 | 2782.9 | 2667.5 | 2607.2 | 2563.3 |
| 20°    | 2761.0 | 2706.0 | 2568.8 | 2500.4 | 2439.8 |
| 22.5°  | 2689.7 | 2626.5 | 2467.2 | 2374.0 | 2333.0 |
| 25°    | 2618.3 | 2530.4 | 2349.3 | 2236.9 | 2195.5 |
| 27.5°  | 2533.3 | 2439.8 | 2239.5 | 2110.5 | 2047.3 |
| 30°    | 2442.7 | 2338.2 | 2118.6 | 1978.9 | 1904.6 |
| 32.5°  | 2354.7 | 2228.4 | 2003.6 | 1838.8 | 1770.1 |
| 35°    | 2256.1 | 2116.0 | 1874.6 | 1701.7 | 1641.1 |
| 37.5°  | 2160.0 | 2008.9 | 1753.8 | 1564.2 | 1495.8 |
| 40°    | 2058.4 | 1893.9 | 1627.4 | 1432.6 | 1361.3 |
| 42.5°  | 1954.1 | 1778.6 | 1501.3 | 1298.1 | 1229.6 |
| 45°    | 1844.4 | 1660.4 | 1372.3 | 1177.2 | 1111.4 |
| 47.5°  | 1740.1 | 1545.3 | 1248.9 | 1053.8 | 993.5  |
| 50°    | 1624.8 | 1430.0 | 1128.0 | 938.5  | 881.1  |
| 52.5°  | 1512.1 | 1306.3 | 1012.8 | 831.6  | 779.5  |
| 55°    | 1402.3 | 1188.3 | 891.9  | 727.4  | 675.2  |
| 57.5°  | 1290.0 | 1070.4 | 785.1  | 631.3  | 587.3  |
| 60°    | 1174.6 | 955.0  | 672.4  | 532.6  | 488.6  |
| 62.5°  | 1062.3 | 842.7  | 576.3  | 444.7  | 422.8  |
| 65°    | 946.9  | 724.5  | 477.5  | 384.3  | 375.9  |
| 67.5°  | 837.1  | 614.7  | 384.3  | 337.5  | 329.3  |
| 70°    | 721.9  | 507.8  | 318.3  | 290.9  | 279.8  |
| 72.5°  | 612.0  | 408.8  | 266.1  | 244.3  | 238.8  |
| 75°    | 504.9  | 312.7  | 219.6  | 200.3  | 197.7  |
| 77.5°  | 398.0  | 222.2  | 172.9  | 161.9  | 156.4  |
| 80°    | 299.1  | 159.3  | 131.6  | 120.8  | 120.8  |
| 82.5°  | 208.5  | 107.1  | 90.6   | 85.0   | 85.0   |
| 85°    | 117.9  | 60.3   | 52.1   | 52.1   | 52.1   |
| 87.5°  | 43.9   | 21.8   | 21.8   | 19.2   | 19.2   |
| 90°    | 1.9    | 22.4   | 61.0   | 57.2   | 59.1   |
| 92.5°  | 38.6   | 52.3   | 54.1   | 55.9   | 55.9   |
| 95°    | 90.8   | 108.2  | 111.3  | 111.3  | 108.2  |
| 97.5°  | 151.2  | 167.3  | 174.1  | 174.1  | 174.1  |
| 100°   | 220.8  | 235.1  | 240.0  | 240.0  | 238.1  |
| 102.5° | 294.2  | 304.8  | 311.5  | 313.4  | 311.5  |
| 105°   | 374.4  | 379.4  | 383.1  | 386.2  | 386.2  |
| 107.5° | 454.0  | 461.5  | 461.5  | 462.7  | 454.0  |
| 110°   | 531.1  | 541.0  | 541.0  | 541.0  | 536.1  |



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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 614.4  | 625.0  | 623.1  | 618.2  | 614.4  |
| 115°   | 696.5  | 706.5  | 703.4  | 701.5  | 696.5  |
| 117.5° | 778.0  | 791.7  | 782.9  | 778.0  | 773.0  |
| 120°   | 860.1  | 873.8  | 860.1  | 860.1  | 854.4  |
| 122.5° | 934.7  | 952.1  | 943.4  | 938.4  | 934.7  |
| 125°   | 1013.0 | 1028.6 | 1023.6 | 1018.0 | 1016.2 |
| 127.5° | 1089.6 | 1108.8 | 1102.0 | 1094.5 | 1089.6 |
| 130°   | 1161.1 | 1183.4 | 1180.3 | 1176.6 | 1169.8 |
| 132.5° | 1241.3 | 1258.7 | 1260.0 | 1251.2 | 1246.3 |
| 135°   | 1310.3 | 1329.6 | 1333.3 | 1331.5 | 1326.5 |
| 137.5° | 1387.4 | 1403.0 | 1406.1 | 1404.8 | 1397.3 |
| 140°   | 1455.2 | 1470.7 | 1479.4 | 1479.4 | 1472.6 |
| 142.5° | 1524.9 | 1540.4 | 1545.4 | 1547.3 | 1540.4 |
| 145°   | 1590.8 | 1603.2 | 1613.1 | 1615.0 | 1608.2 |
| 147.5° | 1649.8 | 1665.4 | 1672.8 | 1676.0 | 1669.2 |
| 150°   | 1710.8 | 1721.3 | 1728.2 | 1733.8 | 1728.2 |
| 152.5° | 1764.9 | 1775.5 | 1784.2 | 1791.0 | 1784.2 |
| 155°   | 1819.0 | 1824.0 | 1829.6 | 1838.3 | 1832.7 |
| 157.5° | 1865.6 | 1869.4 | 1872.5 | 1884.9 | 1876.2 |
| 160°   | 1907.3 | 1911.1 | 1912.9 | 1923.5 | 1916.0 |
| 162.5° | 1945.9 | 1945.9 | 1947.7 | 1959.6 | 1950.8 |
| 165°   | 1978.8 | 1976.9 | 1976.9 | 1989.4 | 1980.7 |
| 167.5° | 2008.7 | 2003.1 | 2003.1 | 2015.5 | 2006.8 |
| 170°   | 2031.1 | 2026.1 | 2024.2 | 2036.7 | 2026.1 |
| 172.5° | 2046.6 | 2041.7 | 2039.8 | 2052.2 | 2041.7 |
| 175°   | 2059.0 | 2054.1 | 2050.3 | 2062.8 | 2052.2 |
| 177.5° | 2065.9 | 2060.9 | 2057.2 | 2067.8 | 2057.2 |
| 180°   | 2062.8 | 2062.8 | 2062.8 | 2062.8 | 2062.8 |

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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 | 11.62            | 12.47 | 12.57 | 13.43 | 14.67 | 7.58           | 8.43  | 8.53  | 9.39  | 10.63 |
|                 | 3H   | 13.30            | 14.05 | 14.26 | 15.02 | 16.29 | 8.77           | 9.52  | 9.73  | 10.49 | 11.76 |
|                 | 4H   | 13.90            | 14.62 | 14.88 | 15.59 | 16.87 | 9.21           | 9.93  | 10.19 | 10.90 | 12.18 |
|                 | 6H   | 14.32            | 14.98 | 15.31 | 15.96 | 17.25 | 9.53           | 10.19 | 10.51 | 11.17 | 12.45 |
|                 | 8H   | 14.45            | 15.07 | 15.44 | 16.07 | 17.35 | 9.62           | 10.24 | 10.61 | 11.24 | 12.52 |
|                 | 12H  | 14.51            | 15.10 | 15.50 | 16.09 | 17.40 | 9.66           | 10.25 | 10.65 | 11.24 | 12.55 |
| 4H              | 2H   | 11.64            | 12.36 | 12.62 | 13.33 | 14.61 | 8.18           | 8.89  | 9.16  | 9.87  | 11.14 |
|                 | 3H   | 13.47            | 14.06 | 14.45 | 15.06 | 16.35 | 9.52           | 10.12 | 10.51 | 11.12 | 12.41 |
|                 | 4H   | 14.16            | 14.70 | 15.15 | 15.69 | 17.01 | 10.07          | 10.61 | 11.06 | 11.60 | 12.92 |
|                 | 6H   | 14.67            | 15.13 | 15.67 | 16.15 | 17.46 | 10.48          | 10.95 | 11.49 | 11.96 | 13.28 |
|                 | 8H   | 14.84            | 15.28 | 15.85 | 16.29 | 17.61 | 10.60          | 11.04 | 11.61 | 12.05 | 13.38 |
|                 | 12H  | 14.93            | 15.33 | 15.96 | 16.35 | 17.68 | 10.67          | 11.06 | 11.69 | 12.09 | 13.42 |
| 8H              | 4H   | 14.12            | 14.56 | 15.13 | 15.57 | 16.90 | 10.34          | 10.78 | 11.35 | 11.79 | 13.12 |
|                 | 6H   | 14.68            | 15.04 | 15.72 | 16.10 | 17.42 | 10.85          | 11.21 | 11.89 | 12.27 | 13.59 |
|                 | 8H   | 14.90            | 15.21 | 15.94 | 16.25 | 17.60 | 11.04          | 11.36 | 12.08 | 12.40 | 13.74 |
|                 | 12H  | 15.03            | 15.31 | 16.08 | 16.35 | 17.73 | 11.16          | 11.43 | 12.20 | 12.47 | 13.85 |
| 12H             | 4H   | 14.08            | 14.47 | 15.10 | 15.50 | 16.83 | 10.35          | 10.74 | 11.38 | 11.77 | 13.10 |
|                 | 6H   | 14.66            | 14.98 | 15.70 | 16.02 | 17.36 | 10.90          | 11.22 | 11.94 | 12.26 | 13.60 |
|                 | 8H   | 14.88            | 15.16 | 15.92 | 16.19 | 17.58 | 11.11          | 11.39 | 12.15 | 12.42 | 13.81 |