

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: P922658

Luminaire Tested: DFN2DIP-SQ2F0-060D080US940-RLLFLL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P922658  
REPORT IS A COMBINATION OF REPORTS P899838 AND P896659  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-SQ2F0-060D080US940-RLLFLL  
Description: 2 foot, Square Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

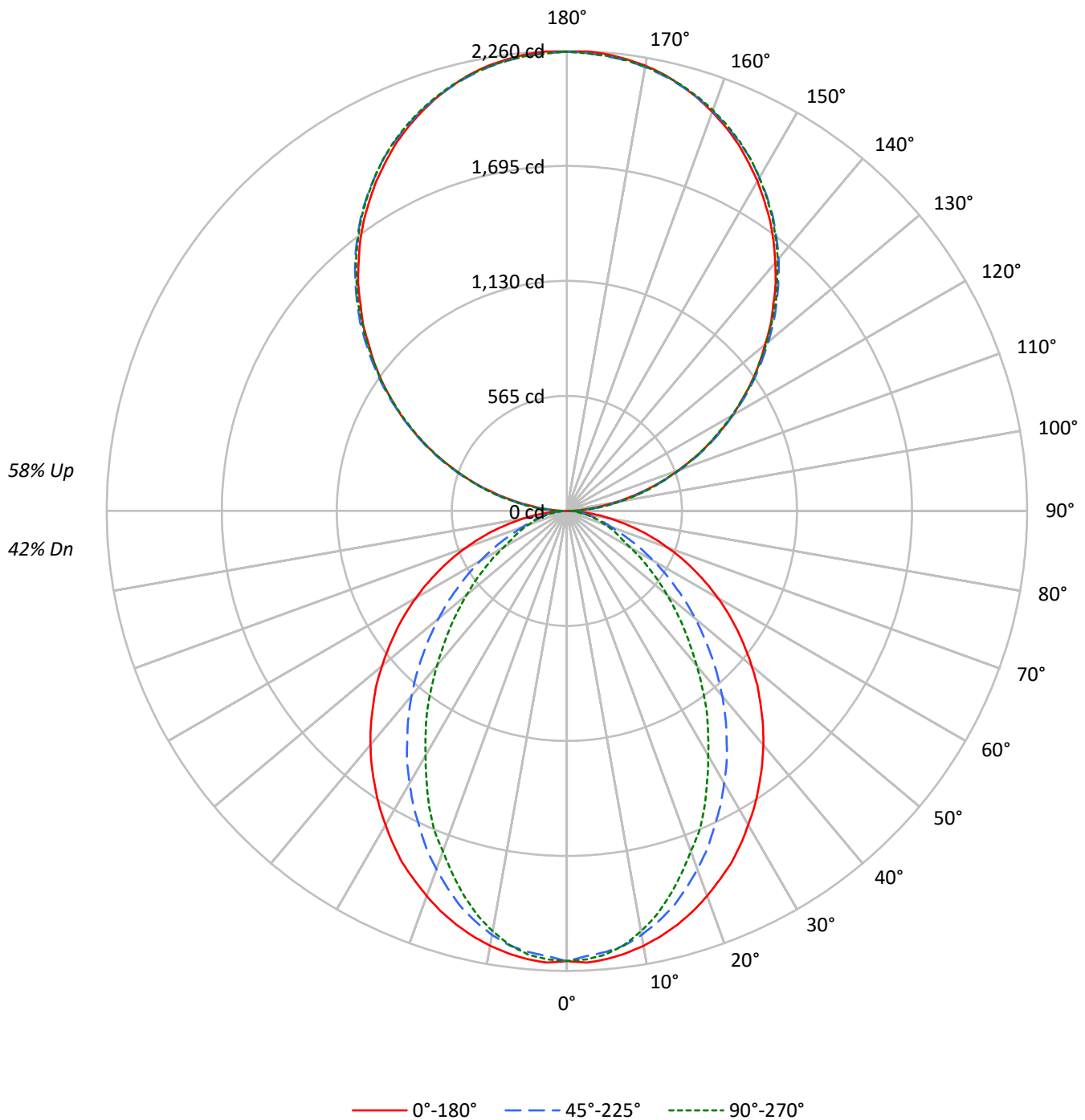
Lumens per Lamp: N/A  
Luminaire Lumens: 10861.0 lumens  
Efficiency: N/A  
Efficacy: 90.5 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 0.99 / 1.16  
Luminous Opening: Rectangular w/ Sides (W: 2.21' x L: 2.21' x H: 0.1')  
CIE Type: General Diffuse

Input Watts (W): 120  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9781  
Total Harmonic Distortion (THDi): 0.075  
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: P922658

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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   | 105 | 105 | 105 | 105 | 96 | 96 | 96 | 96 | 79 | 79 | 79 | 63 | 63 | 63 | 49 | 49 | 49 |
| 1   | 96  | 92  | 89  | 85  | 88 | 84 | 81 | 78 | 70 | 67 | 65 | 56 | 55 | 53 | 44 | 43 | 42 |
| 2   | 88  | 81  | 75  | 70  | 80 | 74 | 69 | 65 | 61 | 58 | 55 | 50 | 47 | 45 | 39 | 37 | 36 |
| 3   | 81  | 72  | 65  | 59  | 73 | 66 | 60 | 55 | 55 | 50 | 47 | 44 | 41 | 39 | 35 | 33 | 31 |
| 4   | 74  | 64  | 56  | 50  | 67 | 58 | 52 | 47 | 49 | 44 | 40 | 40 | 36 | 33 | 31 | 29 | 27 |
| 5   | 68  | 57  | 49  | 43  | 62 | 52 | 45 | 40 | 44 | 39 | 35 | 36 | 32 | 29 | 28 | 26 | 24 |
| 6   | 63  | 51  | 43  | 38  | 57 | 47 | 40 | 35 | 40 | 34 | 30 | 33 | 29 | 26 | 26 | 23 | 21 |
| 7   | 58  | 46  | 38  | 33  | 53 | 43 | 36 | 31 | 36 | 31 | 27 | 30 | 26 | 23 | 24 | 21 | 19 |
| 8   | 54  | 42  | 34  | 29  | 49 | 39 | 32 | 28 | 33 | 28 | 24 | 27 | 23 | 21 | 22 | 19 | 17 |
| 9   | 50  | 38  | 31  | 26  | 46 | 36 | 29 | 25 | 30 | 25 | 22 | 25 | 21 | 19 | 20 | 18 | 16 |
| 10  | 47  | 35  | 28  | 24  | 43 | 33 | 26 | 22 | 28 | 23 | 19 | 23 | 19 | 17 | 19 | 16 | 14 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 4862 | 4862 | 4862 |
| 5°  | 4862 | 4774 | 4809 |
| 10° | 4805 | 4670 | 4646 |
| 15° | 4731 | 4506 | 4398 |
| 20° | 4634 | 4283 | 4096 |
| 25° | 4537 | 4036 | 3804 |
| 30° | 4407 | 3783 | 3436 |
| 35° | 4280 | 3512 | 3114 |
| 40° | 4151 | 3233 | 2745 |
| 45° | 4001 | 2925 | 2411 |
| 50° | 3846 | 2615 | 2086 |
| 55° | 3682 | 2284 | 1773 |
| 60° | 3493 | 1941 | 1453 |
| 65° | 3275 | 1593 | 1300 |
| 70° | 3010 | 1269 | 1167 |
| 75° | 2677 | 1098 | 1048 |
| 80° | 2197 | 891  | 888  |
| 85° | 1431 | 554  | 632  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°  
Vertical Angle: 45°  
Luminance: 4001 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 207.2   | 1.9       |
| 10°-20°   | 568.9   | 5.2       |
| 20°-30°   | 798.7   | 7.4       |
| 30°-40°   | 870.7   | 8.0       |
| 40°-50°   | 800.3   | 7.4       |
| 50°-60°   | 628.5   | 5.8       |
| 60°-70°   | 409.1   | 3.8       |
| 70°-80°   | 210.6   | 1.9       |
| 80°-90°   | 60.2    | 0.6       |
| 90°-100°  | 139.6   | 1.3       |
| 100°-110° | 443.6   | 4.1       |
| 110°-120° | 759.1   | 7.0       |
| 120°-130° | 998.3   | 9.2       |
| 130°-140° | 1120.6  | 10.3      |
| 140°-150° | 1098.9  | 10.1      |
| 150°-160° | 921.8   | 8.5       |
| 160°-170° | 611.3   | 5.6       |
| 170°-180° | 213.7   | 2.0       |
| 0°-30°    | 1574.9  | 14.5      |
| 0°-40°    | 2445.6  | 22.5      |
| 0°-60°    | 3874.3  | 35.7      |
| 0°-90°    | 4554.1  | 41.9      |
| 90°-120°  | 1342.3  | 12.4      |
| 90°-150°  | 4560.1  | 42.0      |
| 90°-180°  | 6307.0  | 58.1      |
| 0°-180°   | 10861.0 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 2211 | 2211  | 2211 | 2211  | 2211 |      |
| 5°   | 2211 | 2201  | 2175 | 2193  | 2187 | 210  |
| 15°  | 2103 | 2081  | 2013 | 1975  | 1955 | 593  |
| 25°  | 1909 | 1845  | 1713 | 1631  | 1601 | 878  |
| 35°  | 1645 | 1543  | 1367 | 1241  | 1197 | 1030 |
| 45°  | 1345 | 1211  | 1001 | 858   | 810  | 1039 |
| 55°  | 1022 | 866   | 650  | 530   | 492  | 914  |
| 65°  | 690  | 528   | 348  | 280   | 274  | 685  |
| 75°  | 368  | 228   | 160  | 146   | 144  | 389  |
| 85°  | 86   | 44    | 38   | 38    | 38   | 99   |
| 90°  | 2    | 24    | 67   | 63    | 65   | 11   |
| 95°  | 99   | 118   | 122  | 122   | 118  | 111  |
| 105° | 410  | 415   | 419  | 422   | 422  | 432  |
| 115° | 762  | 773   | 769  | 767   | 762  | 753  |
| 125° | 1108 | 1125  | 1120 | 1113  | 1111 | 990  |
| 135° | 1433 | 1454  | 1458 | 1456  | 1451 | 1108 |
| 145° | 1740 | 1754  | 1764 | 1766  | 1759 | 1087 |
| 155° | 1990 | 1995  | 2001 | 2010  | 2004 | 916  |
| 165° | 2164 | 2162  | 2162 | 2176  | 2166 | 611  |
| 175° | 2252 | 2247  | 2242 | 2256  | 2244 | 214  |
| 180° | 2256 | 2256  | 2256 | 2256  | 2256 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 2211.3 | 2211.3 | 2211.3 | 2211.3 | 2211.3 |
| 2.5°   | 2221.3 | 2211.3 | 2189.1 | 2209.3 | 2205.3 |
| 5°     | 2211.3 | 2201.3 | 2175.1 | 2193.3 | 2187.3 |
| 7.5°   | 2193.3 | 2181.3 | 2153.3 | 2161.1 | 2151.2 |
| 10°    | 2169.2 | 2155.2 | 2115.3 | 2109.2 | 2097.2 |
| 12.5°  | 2139.3 | 2121.2 | 2067.1 | 2055.2 | 2033.1 |
| 15°    | 2103.2 | 2081.1 | 2013.1 | 1975.1 | 1955.2 |
| 17.5°  | 2061.2 | 2029.1 | 1945.0 | 1901.0 | 1869.0 |
| 20°    | 2013.1 | 1973.0 | 1873.0 | 1823.1 | 1779.0 |
| 22.5°  | 1961.1 | 1915.0 | 1798.9 | 1731.0 | 1701.0 |
| 25°    | 1909.2 | 1845.0 | 1713.0 | 1631.0 | 1600.9 |
| 27.5°  | 1847.2 | 1779.0 | 1632.9 | 1538.8 | 1492.8 |
| 30°    | 1781.1 | 1704.9 | 1544.8 | 1442.9 | 1388.7 |
| 32.5°  | 1717.0 | 1624.9 | 1461.0 | 1340.8 | 1290.7 |
| 35°    | 1645.0 | 1542.9 | 1366.9 | 1240.7 | 1196.6 |
| 37.5°  | 1574.9 | 1464.7 | 1278.8 | 1140.6 | 1090.7 |
| 40°    | 1500.8 | 1380.9 | 1186.6 | 1044.5 | 992.6  |
| 42.5°  | 1424.9 | 1296.8 | 1094.7 | 946.5  | 896.6  |
| 45°    | 1344.8 | 1210.6 | 1000.7 | 858.4  | 810.4  |
| 47.5°  | 1268.8 | 1126.8 | 910.6  | 768.4  | 724.4  |
| 50°    | 1184.7 | 1042.7 | 822.5  | 684.3  | 642.5  |
| 52.5°  | 1102.5 | 952.4  | 738.4  | 606.4  | 568.4  |
| 55°    | 1022.5 | 866.5  | 650.3  | 530.4  | 492.3  |
| 57.5°  | 940.6  | 780.4  | 572.4  | 460.3  | 428.2  |
| 60°    | 856.5  | 696.4  | 490.3  | 388.3  | 356.2  |
| 62.5°  | 774.5  | 614.5  | 420.2  | 324.2  | 308.3  |
| 65°    | 690.5  | 528.2  | 348.2  | 280.3  | 274.1  |
| 67.5°  | 610.4  | 448.2  | 280.3  | 246.1  | 240.1  |
| 70°    | 526.3  | 370.2  | 232.0  | 212.1  | 204.0  |
| 72.5°  | 446.3  | 298.1  | 194.0  | 178.2  | 174.1  |
| 75°    | 368.2  | 228.0  | 160.1  | 146.1  | 144.2  |
| 77.5°  | 290.3  | 162.0  | 126.1  | 118.1  | 114.0  |
| 80°    | 218.0  | 116.1  | 95.9   | 88.1   | 88.1   |
| 82.5°  | 152.0  | 78.1   | 66.0   | 62.0   | 62.0   |
| 85°    | 86.0   | 44.0   | 38.0   | 38.0   | 38.0   |
| 87.5°  | 32.1   | 16.0   | 16.0   | 14.0   | 14.0   |
| 90°    | 2.1    | 24.5   | 66.7   | 62.6   | 64.6   |
| 92.5°  | 42.2   | 57.2   | 59.2   | 61.2   | 61.2   |
| 95°    | 99.3   | 118.3  | 121.7  | 121.7  | 118.3  |
| 97.5°  | 165.3  | 183.0  | 190.5  | 190.5  | 190.5  |
| 100°   | 241.5  | 257.1  | 262.5  | 262.5  | 260.5  |
| 102.5° | 321.7  | 333.3  | 340.7  | 342.8  | 340.7  |
| 105°   | 409.5  | 414.9  | 419.0  | 422.4  | 422.4  |
| 107.5° | 496.5  | 504.7  | 504.7  | 506.0  | 496.5  |
| 110°   | 580.9  | 591.7  | 591.7  | 591.7  | 586.3  |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 672.0  | 683.6  | 681.5  | 676.1  | 672.0  |
| 115°   | 761.8  | 772.7  | 769.3  | 767.2  | 761.8  |
| 117.5° | 850.9  | 865.9  | 856.3  | 850.9  | 845.4  |
| 120°   | 940.7  | 955.6  | 940.7  | 940.7  | 934.5  |
| 122.5° | 1022.3 | 1041.3 | 1031.8 | 1026.4 | 1022.3 |
| 125°   | 1108.0 | 1125.0 | 1119.5 | 1113.4 | 1111.4 |
| 127.5° | 1191.7 | 1212.7 | 1205.2 | 1197.1 | 1191.7 |
| 130°   | 1269.9 | 1294.3 | 1290.9 | 1286.9 | 1279.4 |
| 132.5° | 1357.6 | 1376.6 | 1378.0 | 1368.5 | 1363.1 |
| 135°   | 1433.1 | 1454.2 | 1458.3 | 1456.3 | 1450.8 |
| 137.5° | 1517.4 | 1534.5 | 1537.8 | 1536.5 | 1528.3 |
| 140°   | 1591.6 | 1608.6 | 1618.1 | 1618.1 | 1610.6 |
| 142.5° | 1667.8 | 1684.8 | 1690.2 | 1692.3 | 1684.8 |
| 145°   | 1739.9 | 1753.5 | 1764.3 | 1766.4 | 1758.9 |
| 147.5° | 1804.5 | 1821.5 | 1829.6 | 1833.1 | 1825.6 |
| 150°   | 1871.2 | 1882.7 | 1890.2 | 1896.3 | 1890.2 |
| 152.5° | 1930.3 | 1941.9 | 1951.4 | 1958.9 | 1951.4 |
| 155°   | 1989.5 | 1994.9 | 2001.1 | 2010.5 | 2004.5 |
| 157.5° | 2040.5 | 2044.6 | 2048.0 | 2061.5 | 2052.1 |
| 160°   | 2086.1 | 2090.2 | 2092.2 | 2103.7 | 2095.6 |
| 162.5° | 2128.2 | 2128.2 | 2130.3 | 2143.2 | 2133.7 |
| 165°   | 2164.3 | 2162.2 | 2162.2 | 2175.9 | 2166.3 |
| 167.5° | 2196.9 | 2190.8 | 2190.8 | 2204.4 | 2194.9 |
| 170°   | 2221.4 | 2216.0 | 2213.9 | 2227.6 | 2216.0 |
| 172.5° | 2238.5 | 2233.0 | 2231.0 | 2244.5 | 2233.0 |
| 175°   | 2252.0 | 2246.6 | 2242.5 | 2256.1 | 2244.5 |
| 177.5° | 2259.5 | 2254.1 | 2250.0 | 2261.6 | 2250.0 |
| 180°   | 2256.1 | 2256.1 | 2256.1 | 2256.1 | 2256.1 |

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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 | 11.72            | 12.49 | 12.75 | 13.52 | 14.91 | 7.68           | 8.45  | 8.71  | 9.48  | 10.87 |
|                 | 3H   | 13.37            | 14.06 | 14.41 | 15.10 | 16.51 | 8.85           | 9.54  | 9.89  | 10.58 | 11.98 |
|                 | 4H   | 13.97            | 14.62 | 15.02 | 15.66 | 17.07 | 9.28           | 9.93  | 10.33 | 10.98 | 12.39 |
|                 | 6H   | 14.37            | 14.97 | 15.43 | 16.02 | 17.44 | 9.58           | 10.18 | 10.65 | 11.23 | 12.65 |
|                 | 8H   | 14.49            | 15.06 | 15.55 | 16.12 | 17.54 | 9.66           | 10.23 | 10.73 | 11.30 | 12.72 |
|                 | 12H  | 14.54            | 15.08 | 15.61 | 16.14 | 17.58 | 9.70           | 10.24 | 10.77 | 11.30 | 12.74 |
| 4H              | 2H   | 11.73            | 12.38 | 12.79 | 13.42 | 14.83 | 8.26           | 8.91  | 9.32  | 9.95  | 11.37 |
|                 | 3H   | 13.53            | 14.07 | 14.59 | 15.14 | 16.57 | 9.58           | 10.12 | 10.65 | 11.20 | 12.62 |
|                 | 4H   | 14.20            | 14.70 | 15.27 | 15.76 | 17.21 | 10.11          | 10.61 | 11.18 | 11.67 | 13.12 |
|                 | 6H   | 14.70            | 15.12 | 15.78 | 16.21 | 17.65 | 10.51          | 10.93 | 11.59 | 12.02 | 13.46 |
|                 | 8H   | 14.86            | 15.26 | 15.94 | 16.33 | 17.79 | 10.63          | 11.02 | 11.71 | 12.10 | 13.56 |
|                 | 12H  | 14.94            | 15.30 | 16.04 | 16.39 | 17.85 | 10.68          | 11.04 | 11.78 | 12.13 | 13.59 |
| 8H              | 4H   | 14.16            | 14.56 | 15.24 | 15.64 | 17.09 | 10.38          | 10.77 | 11.46 | 11.85 | 13.31 |
|                 | 6H   | 14.70            | 15.03 | 15.81 | 16.15 | 17.60 | 10.87          | 11.20 | 11.97 | 12.32 | 13.77 |
|                 | 8H   | 14.91            | 15.19 | 16.02 | 16.30 | 17.77 | 11.05          | 11.33 | 12.15 | 12.44 | 13.91 |
|                 | 12H  | 15.03            | 15.28 | 16.14 | 16.38 | 17.89 | 11.15          | 11.40 | 12.26 | 12.50 | 14.01 |
| 12H             | 4H   | 14.11            | 14.47 | 15.21 | 15.56 | 17.02 | 10.38          | 10.73 | 11.47 | 11.83 | 13.29 |
|                 | 6H   | 14.68            | 14.96 | 15.79 | 16.07 | 17.54 | 10.91          | 11.20 | 12.02 | 12.30 | 13.77 |
|                 | 8H   | 14.88            | 15.13 | 15.99 | 16.23 | 17.74 | 11.10          | 11.36 | 12.22 | 12.45 | 13.97 |