

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: P903603

Luminaire Tested: DFN2DIP-SQ2F0-080D060US830-RLLONL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P903603  
REPORT IS A COMBINATION OF REPORTS P901338 AND P898215  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-SQ2F0-080D060US830-RLLONL  
Description: 2 foot, Square Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

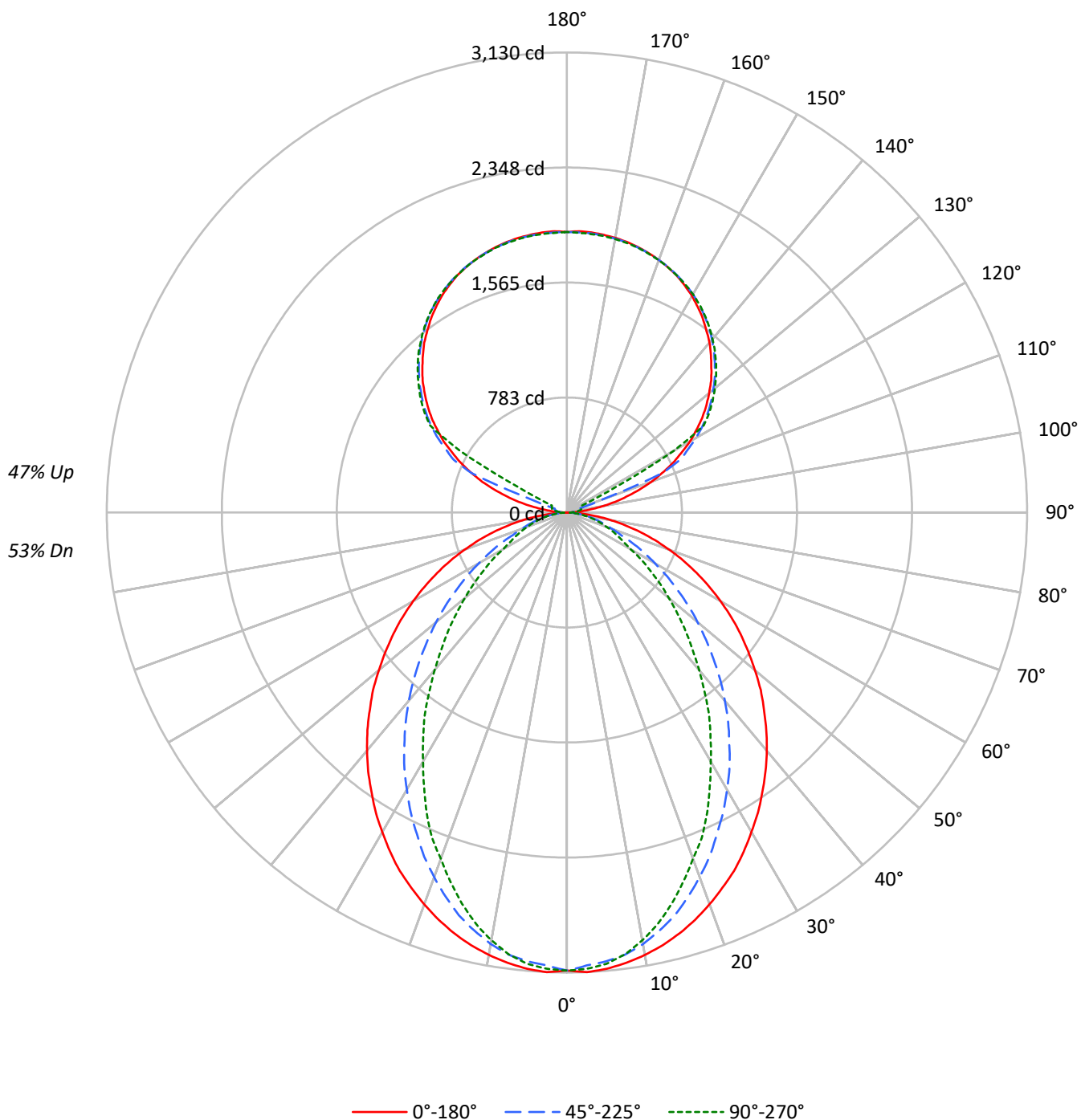
Lumens per Lamp: N/A  
Luminaire Lumens: 12008.0 lumens  
Efficiency: N/A  
Efficacy: 96.2 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 0.99 / 1.16  
Luminous Opening: Rectangular w/ Sides (W: 2.21' x L: 2.21' x H: 0.1')  
CIE Type: General Diffuse

Input Watts (W): 124.8  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9957  
Total Harmonic Distortion (THDi): 0.049  
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   | 108 | 108 | 108 | 108 | 100 | 100 | 100 | 100 | 85 | 85 | 85 | 72 | 72 | 72 | 59 | 59 | 59 |
| 1   | 99  | 95  | 91  | 88  | 92  | 88  | 85  | 82  | 76 | 73 | 71 | 64 | 62 | 61 | 53 | 52 | 51 |
| 2   | 91  | 83  | 78  | 73  | 84  | 78  | 73  | 68  | 67 | 63 | 60 | 57 | 54 | 52 | 47 | 45 | 44 |
| 3   | 83  | 74  | 67  | 61  | 77  | 69  | 63  | 58  | 59 | 55 | 51 | 51 | 47 | 44 | 42 | 40 | 38 |
| 4   | 76  | 66  | 58  | 52  | 70  | 61  | 55  | 49  | 53 | 48 | 44 | 45 | 42 | 38 | 38 | 35 | 33 |
| 5   | 70  | 59  | 51  | 45  | 65  | 55  | 48  | 43  | 48 | 42 | 38 | 41 | 37 | 34 | 35 | 32 | 29 |
| 6   | 65  | 53  | 45  | 39  | 60  | 50  | 43  | 37  | 43 | 38 | 34 | 37 | 33 | 30 | 32 | 28 | 26 |
| 7   | 60  | 48  | 40  | 35  | 56  | 45  | 38  | 33  | 39 | 34 | 30 | 34 | 30 | 26 | 29 | 26 | 23 |
| 8   | 56  | 44  | 36  | 31  | 52  | 41  | 34  | 29  | 36 | 31 | 27 | 31 | 27 | 24 | 27 | 24 | 21 |
| 9   | 52  | 40  | 33  | 28  | 48  | 38  | 31  | 26  | 33 | 28 | 24 | 29 | 25 | 22 | 25 | 22 | 19 |
| 10  | 49  | 37  | 30  | 25  | 45  | 35  | 28  | 24  | 31 | 25 | 22 | 27 | 23 | 20 | 23 | 20 | 17 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 6853 | 6853 | 6853 |
| 5°  | 6852 | 6729 | 6777 |
| 10° | 6772 | 6582 | 6547 |
| 15° | 6667 | 6350 | 6198 |
| 20° | 6532 | 6037 | 5772 |
| 25° | 6393 | 5688 | 5361 |
| 30° | 6211 | 5331 | 4843 |
| 35° | 6032 | 4950 | 4388 |
| 40° | 5850 | 4556 | 3868 |
| 45° | 5639 | 4122 | 3398 |
| 50° | 5420 | 3685 | 2939 |
| 55° | 5190 | 3220 | 2499 |
| 60° | 4923 | 2736 | 2048 |
| 65° | 4616 | 2245 | 1832 |
| 70° | 4242 | 1789 | 1645 |
| 75° | 3772 | 1548 | 1477 |
| 80° | 3097 | 1257 | 1251 |
| 85° | 2016 | 780  | 890  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 5639 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 292.1   | 2.4       |
| 10°-20°   | 801.8   | 6.7       |
| 20°-30°   | 1125.7  | 9.4       |
| 30°-40°   | 1227.1  | 10.2      |
| 40°-50°   | 1127.8  | 9.4       |
| 50°-60°   | 885.7   | 7.4       |
| 60°-70°   | 576.5   | 4.8       |
| 70°-80°   | 296.8   | 2.5       |
| 80°-90°   | 79.1    | 0.7       |
| 90°-100°  | 62.9    | 0.5       |
| 100°-110° | 234.6   | 2.0       |
| 110°-120° | 622.2   | 5.2       |
| 120°-130° | 1032.0  | 8.6       |
| 130°-140° | 1096.2  | 9.1       |
| 140°-150° | 1018.8  | 8.5       |
| 150°-160° | 819.1   | 6.8       |
| 160°-170° | 527.8   | 4.4       |
| 170°-180° | 181.7   | 1.5       |
| 0°-30°    | 2219.6  | 18.5      |
| 0°-40°    | 3446.7  | 28.7      |
| 0°-60°    | 5460.2  | 45.5      |
| 0°-90°    | 6412.7  | 53.4      |
| 90°-120°  | 919.8   | 7.7       |
| 90°-150°  | 4066.8  | 33.9      |
| 90°-180°  | 5595.0  | 46.6      |
| 0°-180°   | 12008.0 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 3116 | 3116  | 3116 | 3116  | 3116 |      |
| 5°   | 3116 | 3102  | 3066 | 3091  | 3083 | 296  |
| 15°  | 2964 | 2933  | 2837 | 2784  | 2756 | 835  |
| 25°  | 2691 | 2600  | 2414 | 2299  | 2256 | 1237 |
| 35°  | 2318 | 2174  | 1926 | 1749  | 1686 | 1451 |
| 45°  | 1895 | 1706  | 1410 | 1210  | 1142 | 1464 |
| 55°  | 1441 | 1221  | 916  | 747   | 694  | 1288 |
| 65°  | 973  | 744   | 491  | 395   | 386  | 965  |
| 75°  | 519  | 321   | 226  | 206   | 203  | 549  |
| 85°  | 121  | 62    | 54   | 54    | 54   | 139  |
| 90°  | 1    | 17    | 28   | 35    | 37   | 11   |
| 95°  | 90   | 44    | 54   | 61    | 59   | 106  |
| 105° | 420  | 461   | 84   | 99    | 105  | 449  |
| 115° | 794  | 818   | 852  | 213   | 113  | 782  |
| 125° | 1123 | 1141  | 1167 | 1177  | 1181 | 1001 |
| 135° | 1389 | 1412  | 1424 | 1438  | 1435 | 1073 |
| 145° | 1612 | 1610  | 1634 | 1643  | 1636 | 1008 |
| 155° | 1775 | 1762  | 1779 | 1787  | 1776 | 818  |
| 165° | 1870 | 1862  | 1866 | 1876  | 1866 | 528  |
| 175° | 1913 | 1903  | 1906 | 1915  | 1902 | 182  |
| 180° | 1909 | 1909  | 1909 | 1909  | 1909 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 3116.4 | 3116.4 | 3116.4 | 3116.4 | 3116.4 |
| 2.5°   | 3130.5 | 3116.4 | 3085.3 | 3113.7 | 3108.0 |
| 5°     | 3116.4 | 3102.4 | 3065.5 | 3091.0 | 3082.6 |
| 7.5°   | 3091.0 | 3074.2 | 3034.7 | 3045.8 | 3031.7 |
| 10°    | 3057.1 | 3037.4 | 2981.2 | 2972.5 | 2955.7 |
| 12.5°  | 3015.0 | 2989.6 | 2913.2 | 2896.4 | 2865.3 |
| 15°    | 2964.1 | 2933.0 | 2837.2 | 2783.7 | 2755.5 |
| 17.5°  | 2904.8 | 2859.7 | 2741.2 | 2679.3 | 2634.0 |
| 20°    | 2837.2 | 2780.7 | 2639.8 | 2569.5 | 2507.2 |
| 22.5°  | 2763.9 | 2699.0 | 2535.3 | 2439.6 | 2397.4 |
| 25°    | 2690.6 | 2600.3 | 2414.1 | 2298.7 | 2256.2 |
| 27.5°  | 2603.2 | 2507.2 | 2301.3 | 2168.8 | 2103.8 |
| 30°    | 2510.2 | 2402.7 | 2177.2 | 2033.5 | 1957.2 |
| 32.5°  | 2419.8 | 2290.0 | 2059.0 | 1889.6 | 1819.0 |
| 35°    | 2318.4 | 2174.4 | 1926.4 | 1748.7 | 1686.4 |
| 37.5°  | 2219.6 | 2064.4 | 1802.2 | 1607.4 | 1537.1 |
| 40°    | 2115.3 | 1946.2 | 1672.4 | 1472.2 | 1398.8 |
| 42.5°  | 2008.1 | 1827.7 | 1542.8 | 1334.0 | 1263.6 |
| 45°    | 1895.3 | 1706.2 | 1410.2 | 1209.8 | 1142.2 |
| 47.5°  | 1788.2 | 1588.0 | 1283.4 | 1082.9 | 1021.0 |
| 50°    | 1669.6 | 1469.5 | 1159.2 | 964.4  | 905.4  |
| 52.5°  | 1553.9 | 1342.3 | 1040.7 | 854.6  | 801.1  |
| 55°    | 1441.1 | 1221.2 | 916.5  | 747.4  | 693.9  |
| 57.5°  | 1325.6 | 1099.9 | 806.7  | 648.8  | 603.5  |
| 60°    | 1207.0 | 981.5  | 690.9  | 547.2  | 502.1  |
| 62.5°  | 1091.6 | 865.9  | 592.2  | 456.9  | 434.5  |
| 65°    | 973.1  | 744.4  | 490.7  | 395.0  | 386.3  |
| 67.5°  | 860.3  | 631.7  | 395.0  | 346.8  | 338.5  |
| 70°    | 741.8  | 521.9  | 327.1  | 298.9  | 287.6  |
| 72.5°  | 629.0  | 420.1  | 273.5  | 251.1  | 245.3  |
| 75°    | 518.9  | 321.4  | 225.6  | 205.9  | 203.2  |
| 77.5°  | 409.1  | 228.3  | 177.8  | 166.4  | 160.7  |
| 80°    | 307.3  | 163.7  | 135.3  | 124.1  | 124.1  |
| 82.5°  | 214.2  | 110.1  | 93.0   | 87.4   | 87.4   |
| 85°    | 121.2  | 61.9   | 53.5   | 53.5   | 53.5   |
| 87.5°  | 45.1   | 22.4   | 22.4   | 19.8   | 19.8   |
| 90°    | 1.3    | 16.6   | 27.5   | 34.6   | 37.2   |
| 92.5°  | 34.6   | 29.0   | 33.1   | 35.9   | 37.2   |
| 95°    | 89.7   | 44.1   | 53.8   | 60.9   | 59.4   |
| 97.5°  | 161.6  | 48.4   | 70.3   | 74.6   | 76.0   |
| 100°   | 244.5  | 55.2   | 78.7   | 89.7   | 92.5   |
| 102.5° | 335.5  | 332.9  | 81.5   | 96.6   | 100.9  |
| 105°   | 419.8  | 461.3  | 84.3   | 99.3   | 105.0  |
| 107.5° | 517.9  | 552.3  | 87.1   | 102.2  | 107.7  |
| 110°   | 611.9  | 640.7  | 241.8  | 103.7  | 109.1  |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 700.2  | 725.0  | 701.5  | 106.2  | 110.6  |
| 115°   | 794.1  | 817.6  | 852.2  | 212.7  | 113.3  |
| 117.5° | 875.5  | 903.1  | 926.7  | 729.2  | 367.3  |
| 120°   | 966.8  | 987.4  | 1012.4 | 1028.9 | 842.4  |
| 122.5° | 1044.0 | 1066.1 | 1093.8 | 1102.0 | 1103.5 |
| 125°   | 1122.8 | 1140.8 | 1167.0 | 1176.7 | 1180.7 |
| 127.5° | 1194.6 | 1213.9 | 1234.7 | 1248.5 | 1249.8 |
| 130°   | 1262.3 | 1284.4 | 1299.5 | 1314.8 | 1313.4 |
| 132.5° | 1331.3 | 1349.3 | 1364.4 | 1376.9 | 1375.5 |
| 135°   | 1389.4 | 1411.6 | 1423.8 | 1437.8 | 1434.9 |
| 137.5° | 1450.0 | 1466.6 | 1480.5 | 1494.3 | 1490.3 |
| 140°   | 1509.4 | 1520.6 | 1535.7 | 1548.1 | 1541.2 |
| 142.5° | 1559.2 | 1569.0 | 1586.9 | 1597.8 | 1590.9 |
| 145°   | 1611.7 | 1610.2 | 1633.7 | 1643.4 | 1636.5 |
| 147.5° | 1657.2 | 1653.0 | 1676.5 | 1683.4 | 1678.0 |
| 150°   | 1701.5 | 1691.8 | 1713.9 | 1722.1 | 1715.2 |
| 152.5° | 1738.7 | 1727.7 | 1748.3 | 1756.7 | 1747.0 |
| 155°   | 1774.6 | 1762.3 | 1778.9 | 1787.1 | 1776.0 |
| 157.5° | 1803.6 | 1792.6 | 1805.1 | 1814.8 | 1803.6 |
| 160°   | 1828.5 | 1820.1 | 1828.5 | 1836.7 | 1827.1 |
| 162.5° | 1850.5 | 1842.3 | 1849.2 | 1858.9 | 1846.4 |
| 165°   | 1869.9 | 1861.7 | 1865.8 | 1875.5 | 1865.8 |
| 167.5° | 1885.1 | 1876.8 | 1881.0 | 1890.7 | 1878.2 |
| 170°   | 1897.6 | 1889.2 | 1892.1 | 1901.7 | 1889.2 |
| 172.5° | 1905.8 | 1897.6 | 1900.4 | 1910.1 | 1897.6 |
| 175°   | 1912.7 | 1903.0 | 1905.8 | 1915.4 | 1901.7 |
| 177.5° | 1915.4 | 1905.8 | 1907.2 | 1916.9 | 1904.5 |
| 180°   | 1908.6 | 1908.6 | 1908.6 | 1908.6 | 1908.6 |

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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 | 14.03            | 14.89 | 14.97 | 15.84 | 17.06 | 9.99           | 10.85 | 10.93 | 11.80 | 13.02 |
|                 | 3H   | 15.69            | 16.46 | 16.64 | 17.42 | 18.66 | 11.17          | 11.93 | 12.11 | 12.89 | 14.14 |
|                 | 4H   | 16.29            | 17.01 | 17.25 | 17.97 | 19.23 | 11.60          | 12.33 | 12.56 | 13.29 | 14.55 |
|                 | 6H   | 16.70            | 17.36 | 17.67 | 18.33 | 19.60 | 11.91          | 12.58 | 12.88 | 13.54 | 14.81 |
|                 | 8H   | 16.81            | 17.45 | 17.79 | 18.43 | 19.70 | 11.99          | 12.63 | 12.97 | 13.61 | 14.88 |
|                 | 12H  | 16.87            | 17.47 | 17.85 | 18.45 | 19.74 | 12.03          | 12.63 | 13.01 | 13.61 | 14.90 |
| 4H              | 2H   | 14.05            | 14.77 | 15.01 | 15.73 | 16.99 | 10.58          | 11.31 | 11.55 | 12.27 | 13.52 |
|                 | 3H   | 15.86            | 16.46 | 16.83 | 17.45 | 18.72 | 11.91          | 12.52 | 12.89 | 13.51 | 14.78 |
|                 | 4H   | 16.54            | 17.09 | 17.52 | 18.07 | 19.37 | 12.45          | 13.00 | 13.43 | 13.98 | 15.28 |
|                 | 6H   | 17.03            | 17.51 | 18.03 | 18.51 | 19.81 | 12.85          | 13.32 | 13.84 | 14.33 | 15.62 |
|                 | 8H   | 17.20            | 17.64 | 18.20 | 18.64 | 19.95 | 12.97          | 13.41 | 13.96 | 14.41 | 15.72 |
|                 | 12H  | 17.28            | 17.68 | 18.30 | 18.70 | 20.01 | 13.02          | 13.42 | 14.04 | 14.44 | 15.75 |
| 8H              | 4H   | 16.50            | 16.94 | 17.50 | 17.94 | 19.25 | 12.72          | 13.16 | 13.71 | 14.16 | 15.47 |
|                 | 6H   | 17.05            | 17.41 | 18.07 | 18.45 | 19.76 | 13.21          | 13.58 | 14.23 | 14.62 | 15.92 |
|                 | 8H   | 17.25            | 17.57 | 18.28 | 18.60 | 19.93 | 13.39          | 13.71 | 14.42 | 14.74 | 16.06 |
|                 | 12H  | 17.38            | 17.66 | 18.41 | 18.68 | 20.05 | 13.49          | 13.78 | 14.53 | 14.80 | 16.17 |
| 12H             | 4H   | 16.45            | 16.85 | 17.47 | 17.87 | 19.18 | 12.72          | 13.12 | 13.74 | 14.13 | 15.45 |
|                 | 6H   | 17.02            | 17.34 | 18.05 | 18.37 | 19.70 | 13.26          | 13.58 | 14.29 | 14.61 | 15.93 |
|                 | 8H   | 17.23            | 17.51 | 18.26 | 18.53 | 19.90 | 13.45          | 13.73 | 14.48 | 14.76 | 16.13 |