

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: P914617

Luminaire Tested: DFN2DIP-SQ3F0-060D090US927-FLLONL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P914617  
REPORT IS A COMBINATION OF REPORTS P901475 AND P898289  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-SQ3F0-060D090US927-FLLONL  
Description: 3 foot, Square Define Geo, with Direct Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

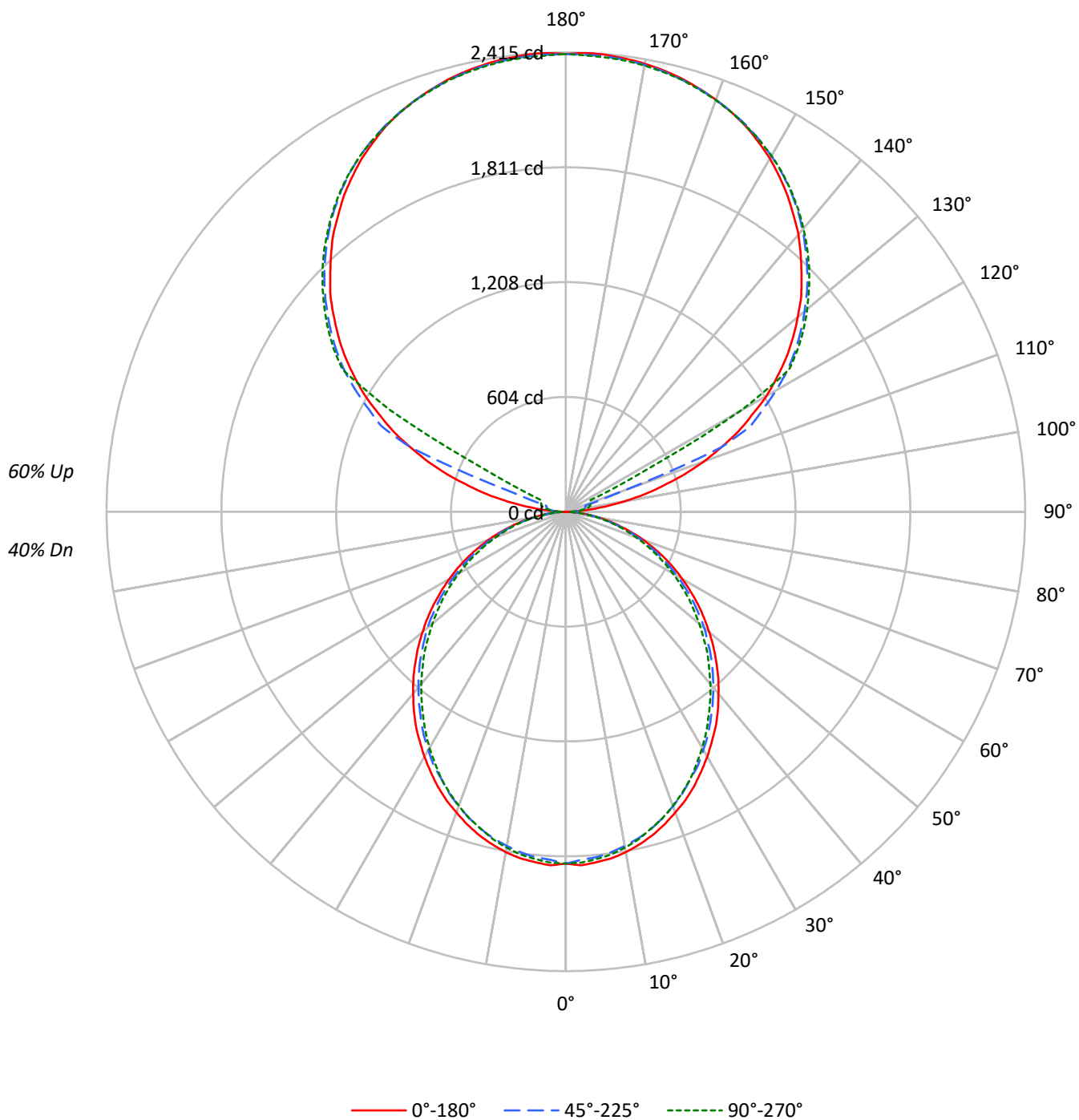
Lumens per Lamp: N/A  
Luminaire Lumens: 11763.8 lumens  
Efficiency: N/A  
Efficacy: 96.5 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 3.06' x L: 3.06' x H: 0.1')  
CIE Type: General Diffuse

Input Watts (W): 121.9  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9971  
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   | 105 | 105 | 105 | 105 | 95 | 95 | 95 | 95 | 78 | 78 | 78 | 62 | 62 | 62 | 47 | 47 | 47 |
| 1   | 96  | 91  | 87  | 84  | 87 | 83 | 80 | 77 | 68 | 66 | 64 | 54 | 53 | 51 | 41 | 41 | 40 |
| 2   | 87  | 80  | 74  | 69  | 79 | 73 | 68 | 63 | 60 | 56 | 53 | 48 | 45 | 43 | 37 | 35 | 33 |
| 3   | 79  | 70  | 63  | 57  | 72 | 64 | 58 | 53 | 53 | 48 | 44 | 42 | 39 | 36 | 32 | 30 | 28 |
| 4   | 73  | 62  | 54  | 48  | 66 | 57 | 50 | 45 | 47 | 42 | 38 | 37 | 34 | 31 | 29 | 26 | 24 |
| 5   | 67  | 55  | 47  | 41  | 60 | 50 | 44 | 38 | 42 | 37 | 33 | 34 | 30 | 27 | 26 | 23 | 21 |
| 6   | 61  | 49  | 41  | 36  | 56 | 45 | 38 | 33 | 38 | 32 | 28 | 30 | 26 | 23 | 24 | 21 | 19 |
| 7   | 57  | 45  | 37  | 31  | 51 | 41 | 34 | 29 | 34 | 29 | 25 | 28 | 24 | 21 | 22 | 19 | 17 |
| 8   | 52  | 40  | 33  | 27  | 48 | 37 | 30 | 26 | 31 | 26 | 22 | 25 | 21 | 18 | 20 | 17 | 15 |
| 9   | 49  | 37  | 29  | 24  | 44 | 34 | 27 | 23 | 28 | 23 | 20 | 23 | 19 | 17 | 18 | 15 | 13 |
| 10  | 46  | 34  | 27  | 22  | 41 | 31 | 25 | 20 | 26 | 21 | 18 | 21 | 18 | 15 | 17 | 14 | 12 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 2119 | 2119 | 2119 |
| 5°  | 2121 | 2088 | 2103 |
| 10° | 2103 | 2059 | 2074 |
| 15° | 2070 | 2023 | 2029 |
| 20° | 2027 | 1975 | 1982 |
| 25° | 1984 | 1917 | 1929 |
| 30° | 1931 | 1863 | 1861 |
| 35° | 1880 | 1800 | 1790 |
| 40° | 1818 | 1736 | 1722 |
| 45° | 1755 | 1672 | 1652 |
| 50° | 1687 | 1605 | 1571 |
| 55° | 1616 | 1526 | 1497 |
| 60° | 1535 | 1434 | 1412 |
| 65° | 1447 | 1338 | 1311 |
| 70° | 1334 | 1221 | 1203 |
| 75° | 1179 | 1081 | 1102 |
| 80° | 991  | 902  | 911  |
| 85° | 697  | 597  | 597  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 1755 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 174.1   | 1.5       |
| 10°-20°   | 489.8   | 4.2       |
| 20°-30°   | 719.8   | 6.1       |
| 30°-40°   | 836.0   | 7.1       |
| 40°-50°   | 834.9   | 7.1       |
| 50°-60°   | 728.0   | 6.2       |
| 60°-70°   | 538.2   | 4.6       |
| 70°-80°   | 304.5   | 2.6       |
| 80°-90°   | 84.6    | 0.7       |
| 90°-100°  | 79.3    | 0.7       |
| 100°-110° | 295.8   | 2.5       |
| 110°-120° | 784.4   | 6.7       |
| 120°-130° | 1301.0  | 11.1      |
| 130°-140° | 1382.0  | 11.7      |
| 140°-150° | 1284.4  | 10.9      |
| 150°-160° | 1032.6  | 8.8       |
| 160°-170° | 665.4   | 5.7       |
| 170°-180° | 229.0   | 1.9       |
| 0°-30°    | 1383.6  | 11.8      |
| 0°-40°    | 2219.6  | 18.9      |
| 0°-60°    | 3782.5  | 32.2      |
| 0°-90°    | 4709.8  | 40.0      |
| 90°-120°  | 1159.5  | 9.9       |
| 90°-150°  | 5127.0  | 43.6      |
| 90°-180°  | 7054.0  | 60.0      |
| 0°-180°   | 11763.8 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 1849 | 1849  | 1849 | 1849  | 1849 |      |
| 5°   | 1849 | 1842  | 1823 | 1837  | 1834 | 176  |
| 15°  | 1760 | 1750  | 1727 | 1734  | 1725 | 496  |
| 25°  | 1593 | 1579  | 1549 | 1552  | 1549 | 733  |
| 35°  | 1375 | 1357  | 1328 | 1318  | 1309 | 858  |
| 45°  | 1119 | 1106  | 1079 | 1060  | 1053 | 863  |
| 55°  | 847  | 836   | 814  | 793   | 784  | 757  |
| 65°  | 571  | 560   | 542  | 526   | 518  | 564  |
| 75°  | 299  | 295   | 286  | 276   | 279  | 319  |
| 85°  | 73   | 71    | 69   | 64    | 62   | 81   |
| 90°  | 2    | 21    | 35   | 44    | 47   | 11   |
| 95°  | 113  | 56    | 68   | 77    | 75   | 134  |
| 105° | 529  | 582   | 106  | 125   | 132  | 566  |
| 115° | 1001 | 1031  | 1074 | 268   | 143  | 986  |
| 125° | 1415 | 1438  | 1471 | 1483  | 1489 | 1262 |
| 135° | 1752 | 1780  | 1795 | 1813  | 1809 | 1353 |
| 145° | 2032 | 2030  | 2060 | 2072  | 2063 | 1271 |
| 155° | 2237 | 2222  | 2243 | 2253  | 2239 | 1031 |
| 165° | 2357 | 2347  | 2352 | 2364  | 2352 | 666  |
| 175° | 2411 | 2399  | 2403 | 2415  | 2398 | 229  |
| 180° | 2406 | 2406  | 2406 | 2406  | 2406 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 1849.4 | 1849.4 | 1849.4 | 1849.4 | 1849.4 |
| 2.5°   | 1860.2 | 1851.3 | 1831.7 | 1849.4 | 1846.0 |
| 5°     | 1849.4 | 1842.5 | 1822.8 | 1837.0 | 1833.6 |
| 7.5°   | 1837.0 | 1826.5 | 1806.8 | 1821.1 | 1817.6 |
| 10°    | 1817.6 | 1805.1 | 1783.8 | 1797.9 | 1792.6 |
| 12.5°  | 1790.8 | 1780.2 | 1758.9 | 1767.8 | 1764.2 |
| 15°    | 1760.5 | 1750.0 | 1726.8 | 1734.0 | 1725.1 |
| 17.5°  | 1723.2 | 1712.7 | 1689.5 | 1698.3 | 1689.5 |
| 20°    | 1682.3 | 1671.7 | 1646.8 | 1652.1 | 1645.1 |
| 22.5°  | 1641.6 | 1625.5 | 1602.3 | 1602.3 | 1598.7 |
| 25°    | 1593.4 | 1579.3 | 1549.0 | 1552.4 | 1549.0 |
| 27.5°  | 1540.0 | 1527.6 | 1504.5 | 1499.3 | 1490.4 |
| 30°    | 1486.8 | 1472.4 | 1445.9 | 1440.6 | 1433.4 |
| 32.5°  | 1429.8 | 1419.3 | 1390.8 | 1380.0 | 1372.8 |
| 35°    | 1374.8 | 1357.0 | 1328.5 | 1317.7 | 1308.8 |
| 37.5°  | 1312.5 | 1296.4 | 1268.0 | 1255.4 | 1246.6 |
| 40°    | 1248.5 | 1234.1 | 1205.7 | 1189.9 | 1182.6 |
| 42.5°  | 1186.2 | 1171.9 | 1143.6 | 1125.7 | 1115.1 |
| 45°    | 1118.7 | 1106.2 | 1079.4 | 1060.0 | 1052.8 |
| 47.5°  | 1052.8 | 1040.4 | 1011.9 | 992.3  | 981.7  |
| 50°    | 983.4  | 974.5  | 949.7  | 924.7  | 915.8  |
| 52.5°  | 915.8  | 903.4  | 880.4  | 860.8  | 848.3  |
| 55°    | 846.6  | 835.8  | 814.5  | 793.2  | 784.3  |
| 57.5°  | 777.2  | 768.3  | 745.1  | 723.8  | 716.6  |
| 60°    | 707.7  | 700.8  | 675.9  | 656.2  | 650.9  |
| 62.5°  | 640.2  | 627.7  | 610.0  | 592.2  | 585.1  |
| 65°    | 570.9  | 560.2  | 542.5  | 526.4  | 517.5  |
| 67.5°  | 499.8  | 490.8  | 474.9  | 462.5  | 455.3  |
| 70°    | 434.0  | 426.8  | 410.7  | 398.3  | 391.3  |
| 72.5°  | 366.4  | 359.3  | 350.4  | 337.9  | 332.6  |
| 75°    | 298.7  | 295.3  | 286.2  | 275.7  | 279.2  |
| 77.5°  | 238.3  | 231.2  | 227.5  | 222.3  | 217.0  |
| 80°    | 177.9  | 176.0  | 172.5  | 167.2  | 163.6  |
| 82.5°  | 121.0  | 121.0  | 119.2  | 112.1  | 112.1  |
| 85°    | 72.8   | 71.1   | 69.4   | 63.9   | 62.3   |
| 87.5°  | 32.1   | 28.5   | 24.9   | 19.6   | 17.7   |
| 90°    | 1.7    | 20.9   | 34.7   | 43.6   | 46.9   |
| 92.5°  | 43.6   | 36.6   | 41.7   | 45.3   | 46.9   |
| 95°    | 113.1  | 55.6   | 67.8   | 76.7   | 74.9   |
| 97.5°  | 203.7  | 61.0   | 88.7   | 94.0   | 95.7   |
| 100°   | 308.2  | 69.7   | 99.3   | 113.1  | 116.6  |
| 102.5° | 423.0  | 419.7  | 102.7  | 121.8  | 127.1  |
| 105°   | 529.3  | 581.6  | 106.2  | 125.3  | 132.3  |
| 107.5° | 652.9  | 696.3  | 109.8  | 128.8  | 135.9  |
| 110°   | 771.3  | 807.8  | 304.8  | 130.6  | 137.5  |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 882.8  | 914.0  | 884.5  | 134.0  | 139.3  |
| 115°   | 1001.1 | 1030.6 | 1074.3 | 268.2  | 142.8  |
| 117.5° | 1103.8 | 1138.6 | 1168.3 | 919.2  | 463.1  |
| 120°   | 1218.8 | 1244.8 | 1276.3 | 1297.1 | 1062.1 |
| 122.5° | 1316.2 | 1344.1 | 1379.0 | 1389.3 | 1391.2 |
| 125°   | 1415.4 | 1438.1 | 1471.2 | 1483.4 | 1488.6 |
| 127.5° | 1505.9 | 1530.3 | 1556.6 | 1574.0 | 1575.6 |
| 130°   | 1591.3 | 1619.3 | 1638.3 | 1657.5 | 1655.9 |
| 132.5° | 1678.4 | 1701.1 | 1720.1 | 1735.9 | 1734.2 |
| 135°   | 1751.6 | 1779.5 | 1795.0 | 1812.6 | 1809.1 |
| 137.5° | 1828.1 | 1849.0 | 1866.5 | 1883.9 | 1878.7 |
| 140°   | 1902.9 | 1917.0 | 1936.0 | 1951.7 | 1943.1 |
| 142.5° | 1965.8 | 1978.0 | 2000.5 | 2014.4 | 2005.7 |
| 145°   | 2031.9 | 2030.0 | 2059.7 | 2071.9 | 2063.2 |
| 147.5° | 2089.2 | 2084.1 | 2113.6 | 2122.3 | 2115.4 |
| 150°   | 2145.1 | 2132.9 | 2160.8 | 2171.1 | 2162.4 |
| 152.5° | 2192.0 | 2178.1 | 2204.2 | 2214.7 | 2202.5 |
| 155°   | 2237.3 | 2221.8 | 2242.6 | 2253.0 | 2239.1 |
| 157.5° | 2273.9 | 2260.0 | 2275.7 | 2287.9 | 2273.9 |
| 160°   | 2305.2 | 2294.7 | 2305.2 | 2315.6 | 2303.4 |
| 162.5° | 2333.0 | 2322.6 | 2331.3 | 2343.5 | 2327.8 |
| 165°   | 2357.4 | 2347.0 | 2352.2 | 2364.4 | 2352.2 |
| 167.5° | 2376.6 | 2366.1 | 2371.4 | 2383.6 | 2367.9 |
| 170°   | 2392.3 | 2381.8 | 2385.3 | 2397.5 | 2381.8 |
| 172.5° | 2402.7 | 2392.3 | 2395.8 | 2408.0 | 2392.3 |
| 175°   | 2411.3 | 2399.1 | 2402.7 | 2414.8 | 2397.5 |
| 177.5° | 2414.8 | 2402.7 | 2404.5 | 2416.7 | 2401.0 |
| 180°   | 2406.2 | 2406.2 | 2406.2 | 2406.2 | 2406.2 |

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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 | 8.85             | 9.63  | 9.89  | 10.67 | 12.08 | 8.41           | 9.18  | 9.44  | 10.23 | 11.64 |
|                 | 3H   | 10.50            | 11.20 | 11.55 | 12.25 | 13.68 | 10.01          | 10.71 | 11.06 | 11.76 | 13.19 |
|                 | 4H   | 11.08            | 11.74 | 12.14 | 12.80 | 14.23 | 10.59          | 11.25 | 11.65 | 12.30 | 13.74 |
|                 | 6H   | 11.47            | 12.08 | 12.54 | 13.14 | 14.59 | 10.97          | 11.58 | 12.04 | 12.64 | 14.09 |
|                 | 8H   | 11.57            | 12.15 | 12.65 | 13.23 | 14.67 | 11.07          | 11.65 | 12.15 | 12.73 | 14.17 |
|                 | 12H  | 11.62            | 12.17 | 12.70 | 13.24 | 14.70 | 11.11          | 11.66 | 12.19 | 12.73 | 14.19 |
| 4H              | 2H   | 9.30             | 9.96  | 10.36 | 11.01 | 12.45 | 8.94           | 9.60  | 10.01 | 10.66 | 12.09 |
|                 | 3H   | 11.15            | 11.70 | 12.22 | 12.78 | 14.23 | 10.74          | 11.29 | 11.82 | 12.38 | 13.82 |
|                 | 4H   | 11.86            | 12.36 | 12.94 | 13.44 | 14.90 | 11.43          | 11.94 | 12.51 | 13.01 | 14.48 |
|                 | 6H   | 12.36            | 12.80 | 13.45 | 13.89 | 15.36 | 11.93          | 12.37 | 13.02 | 13.46 | 14.92 |
|                 | 8H   | 12.51            | 12.91 | 13.60 | 14.00 | 15.48 | 12.07          | 12.48 | 13.16 | 13.57 | 15.04 |
|                 | 12H  | 12.58            | 12.94 | 13.68 | 14.05 | 15.53 | 12.13          | 12.49 | 13.23 | 13.60 | 15.08 |
| 8H              | 4H   | 12.04            | 12.45 | 13.13 | 13.54 | 15.01 | 11.67          | 12.07 | 12.75 | 13.16 | 14.64 |
|                 | 6H   | 12.66            | 13.00 | 13.78 | 14.13 | 15.60 | 12.28          | 12.62 | 13.39 | 13.75 | 15.22 |
|                 | 8H   | 12.88            | 13.18 | 14.00 | 14.29 | 15.78 | 12.49          | 12.78 | 13.61 | 13.89 | 15.39 |
|                 | 12H  | 13.01            | 13.26 | 14.13 | 14.37 | 15.90 | 12.59          | 12.85 | 13.72 | 13.96 | 15.49 |
| 12H             | 4H   | 12.02            | 12.39 | 13.13 | 13.49 | 14.98 | 11.65          | 12.02 | 12.76 | 13.12 | 14.61 |
|                 | 6H   | 12.69            | 12.99 | 13.81 | 14.10 | 15.59 | 12.32          | 12.61 | 13.44 | 13.73 | 15.22 |
|                 | 8H   | 12.93            | 13.18 | 14.05 | 14.29 | 15.82 | 12.55          | 12.80 | 13.67 | 13.91 | 15.44 |