

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: P919605

Luminaire Tested: DFN2DIP-PN4F0-060D090US935-FLLONL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P919605  
REPORT IS A COMBINATION OF REPORTS P901223 AND P898053  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-PN4F0-060D090US935-FLLONL  
Description: 4 foot, Pentagon Define Geo, with Direct Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

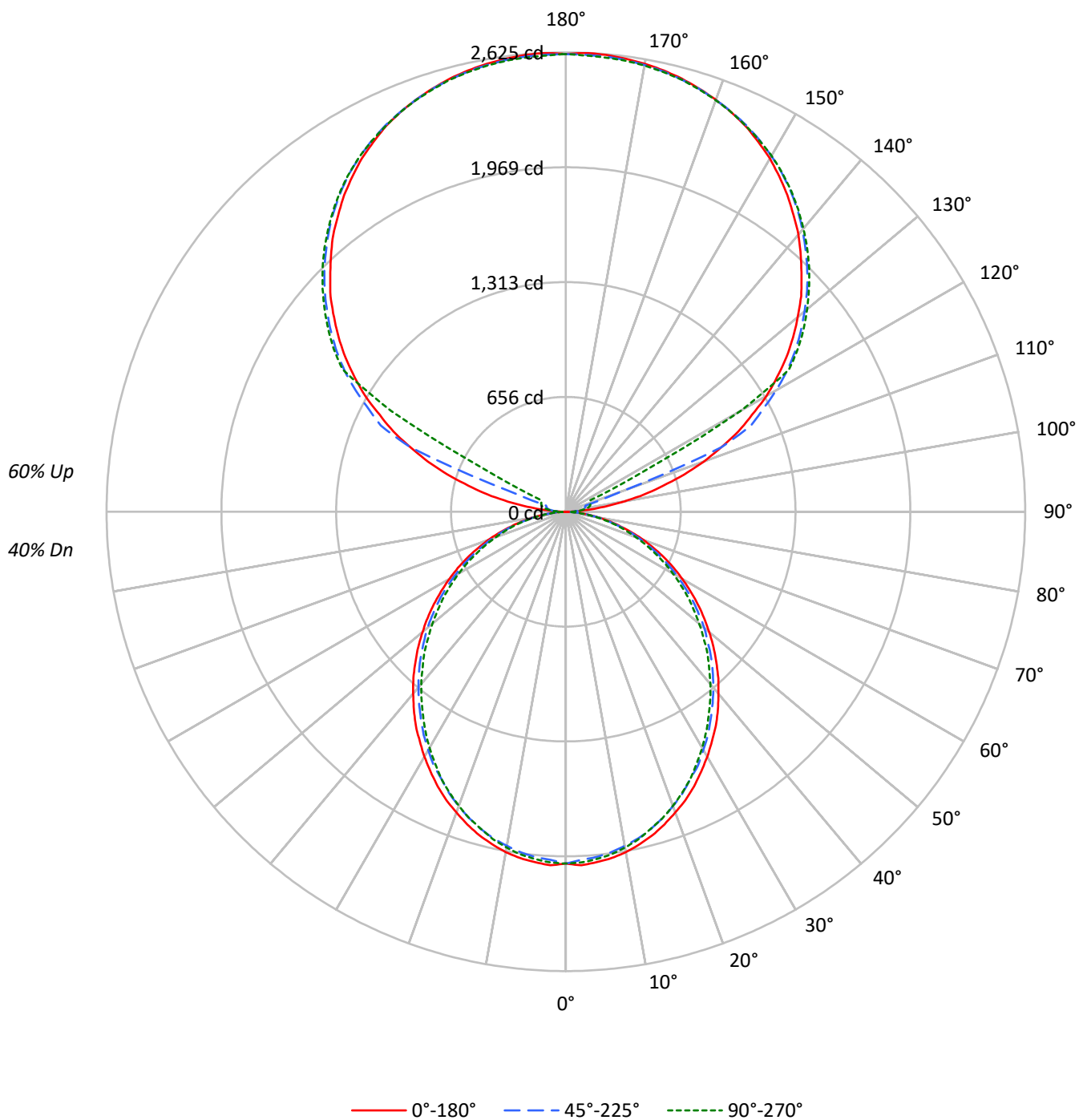
Lumens per Lamp: N/A  
Luminaire Lumens: 12785.8 lumens  
Efficiency: N/A  
Efficacy: 105.5 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 3.74' x L: 3.94' x H: 0.1')  
CIE Type: General Diffuse

Input Watts (W): 121.2  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9933  
Total Harmonic Distortion (THDi): 0.066  
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°  | 1467 | 1467 | 1467 |
| 5°  | 1470 | 1447 | 1457 |
| 10° | 1458 | 1428 | 1437 |
| 15° | 1436 | 1404 | 1407 |
| 20° | 1407 | 1372 | 1376 |
| 25° | 1379 | 1333 | 1339 |
| 30° | 1342 | 1297 | 1293 |
| 35° | 1308 | 1254 | 1244 |
| 40° | 1266 | 1211 | 1198 |
| 45° | 1224 | 1168 | 1151 |
| 50° | 1178 | 1123 | 1096 |
| 55° | 1130 | 1070 | 1045 |
| 60° | 1076 | 1008 | 987  |
| 65° | 1016 | 944  | 919  |
| 70° | 941  | 865  | 846  |
| 75° | 836  | 771  | 778  |
| 80° | 711  | 652  | 649  |
| 85° | 513  | 444  | 434  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 90°

Vertical Angle: 90°

Luminance: 1394 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 189.2   | 1.5       |
| 10°-20°   | 532.3   | 4.2       |
| 20°-30°   | 782.3   | 6.1       |
| 30°-40°   | 908.6   | 7.1       |
| 40°-50°   | 907.5   | 7.1       |
| 50°-60°   | 791.3   | 6.2       |
| 60°-70°   | 584.9   | 4.6       |
| 70°-80°   | 330.9   | 2.6       |
| 80°-90°   | 91.9    | 0.7       |
| 90°-100°  | 86.2    | 0.7       |
| 100°-110° | 321.5   | 2.5       |
| 110°-120° | 852.6   | 6.7       |
| 120°-130° | 1414.1  | 11.1      |
| 130°-140° | 1502.1  | 11.7      |
| 140°-150° | 1396.0  | 10.9      |
| 150°-160° | 1122.4  | 8.8       |
| 160°-170° | 723.2   | 5.7       |
| 170°-180° | 248.9   | 1.9       |
| 0°-30°    | 1503.8  | 11.8      |
| 0°-40°    | 2412.4  | 18.9      |
| 0°-60°    | 4111.1  | 32.2      |
| 0°-90°    | 5118.9  | 40.0      |
| 90°-120°  | 1260.3  | 9.9       |
| 90°-150°  | 5572.4  | 43.6      |
| 90°-180°  | 7667.0  | 60.0      |
| 0°-180°   | 12785.8 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 2010 | 2010  | 2010 | 2010  | 2010 |      |
| 5°   | 2010 | 2002  | 1981 | 1997  | 1993 | 191  |
| 15°  | 1914 | 1902  | 1877 | 1885  | 1875 | 539  |
| 25°  | 1732 | 1716  | 1684 | 1687  | 1684 | 797  |
| 35°  | 1494 | 1475  | 1444 | 1432  | 1422 | 933  |
| 45°  | 1216 | 1202  | 1173 | 1152  | 1144 | 938  |
| 55°  | 920  | 908   | 885  | 862   | 852  | 823  |
| 65°  | 620  | 609   | 590  | 572   | 562  | 614  |
| 75°  | 325  | 321   | 311  | 300   | 304  | 347  |
| 85°  | 79   | 77    | 75   | 70    | 68   | 88   |
| 90°  | 2    | 23    | 38   | 47    | 51   | 12   |
| 95°  | 123  | 60    | 74   | 83    | 81   | 146  |
| 105° | 575  | 632   | 116  | 136   | 144  | 615  |
| 115° | 1088 | 1120  | 1168 | 291   | 155  | 1071 |
| 125° | 1538 | 1563  | 1599 | 1612  | 1618 | 1372 |
| 135° | 1904 | 1934  | 1951 | 1970  | 1966 | 1471 |
| 145° | 2208 | 2206  | 2239 | 2252  | 2242 | 1381 |
| 155° | 2432 | 2415  | 2437 | 2449  | 2434 | 1121 |
| 165° | 2562 | 2551  | 2557 | 2570  | 2557 | 724  |
| 175° | 2621 | 2608  | 2611 | 2625  | 2606 | 249  |
| 180° | 2615 | 2615  | 2615 | 2615  | 2615 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 2010.1 | 2010.1 | 2010.1 | 2010.1 | 2010.1 |
| 2.5°   | 2021.8 | 2012.2 | 1990.8 | 2010.1 | 2006.4 |
| 5°     | 2010.1 | 2002.5 | 1981.2 | 1996.6 | 1992.9 |
| 7.5°   | 1996.6 | 1985.1 | 1963.8 | 1979.3 | 1975.5 |
| 10°    | 1975.5 | 1962.0 | 1938.7 | 1954.1 | 1948.4 |
| 12.5°  | 1946.4 | 1934.8 | 1911.7 | 1921.3 | 1917.4 |
| 15°    | 1913.5 | 1902.0 | 1876.8 | 1884.6 | 1875.0 |
| 17.5°  | 1872.9 | 1861.5 | 1836.3 | 1845.8 | 1836.3 |
| 20°    | 1828.4 | 1817.0 | 1789.8 | 1795.6 | 1788.0 |
| 22.5°  | 1784.2 | 1766.7 | 1741.5 | 1741.5 | 1737.6 |
| 25°    | 1731.8 | 1716.5 | 1683.6 | 1687.3 | 1683.6 |
| 27.5°  | 1673.8 | 1660.3 | 1635.2 | 1629.5 | 1619.9 |
| 30°    | 1616.0 | 1600.3 | 1571.5 | 1565.7 | 1557.9 |
| 32.5°  | 1554.0 | 1542.6 | 1511.6 | 1499.9 | 1492.1 |
| 35°    | 1494.2 | 1474.9 | 1443.9 | 1432.2 | 1422.5 |
| 37.5°  | 1426.5 | 1409.0 | 1378.1 | 1364.5 | 1354.9 |
| 40°    | 1356.9 | 1341.3 | 1310.4 | 1293.2 | 1285.4 |
| 42.5°  | 1289.3 | 1273.7 | 1242.9 | 1223.5 | 1211.9 |
| 45°    | 1215.9 | 1202.3 | 1173.2 | 1152.1 | 1144.3 |
| 47.5°  | 1144.3 | 1130.7 | 1099.8 | 1078.5 | 1066.9 |
| 50°    | 1068.8 | 1059.2 | 1032.2 | 1005.0 | 995.4  |
| 52.5°  | 995.4  | 981.9  | 956.8  | 935.6  | 922.0  |
| 55°    | 920.1  | 908.4  | 885.3  | 862.1  | 852.5  |
| 57.5°  | 844.7  | 835.1  | 809.9  | 786.7  | 778.9  |
| 60°    | 769.2  | 761.6  | 734.6  | 713.3  | 707.5  |
| 62.5°  | 695.8  | 682.3  | 663.0  | 643.7  | 635.9  |
| 65°    | 620.5  | 608.9  | 589.6  | 572.1  | 562.5  |
| 67.5°  | 543.2  | 533.4  | 516.2  | 502.7  | 494.8  |
| 70°    | 471.7  | 463.9  | 446.4  | 432.9  | 425.3  |
| 72.5°  | 398.2  | 390.5  | 380.8  | 367.3  | 361.5  |
| 75°    | 324.6  | 321.0  | 311.1  | 299.6  | 303.5  |
| 77.5°  | 259.0  | 251.2  | 247.3  | 241.6  | 235.8  |
| 80°    | 193.4  | 191.3  | 187.4  | 181.7  | 177.8  |
| 82.5°  | 131.5  | 131.5  | 129.6  | 121.8  | 121.8  |
| 85°    | 79.1   | 77.3   | 75.4   | 69.5   | 67.7   |
| 87.5°  | 34.9   | 31.0   | 27.0   | 21.4   | 19.3   |
| 90°    | 1.8    | 22.7   | 37.7   | 47.4   | 51.0   |
| 92.5°  | 47.4   | 39.8   | 45.4   | 49.2   | 51.0   |
| 95°    | 123.0  | 60.4   | 73.7   | 83.3   | 81.4   |
| 97.5°  | 221.4  | 66.3   | 96.4   | 102.2  | 104.0  |
| 100°   | 335.0  | 75.8   | 107.9  | 123.0  | 126.7  |
| 102.5° | 459.8  | 456.2  | 111.7  | 132.3  | 138.2  |
| 105°   | 575.2  | 632.1  | 115.5  | 136.2  | 143.8  |
| 107.5° | 709.6  | 756.8  | 119.3  | 140.0  | 147.7  |
| 110°   | 838.4  | 878.0  | 331.2  | 142.0  | 149.5  |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 959.5  | 993.4  | 961.3  | 145.6  | 151.4  |
| 115°   | 1088.0 | 1120.2 | 1167.6 | 291.4  | 155.2  |
| 117.5° | 1199.7 | 1237.5 | 1269.8 | 999.1  | 503.3  |
| 120°   | 1324.6 | 1353.0 | 1387.2 | 1409.8 | 1154.3 |
| 122.5° | 1430.5 | 1460.9 | 1498.8 | 1510.0 | 1512.1 |
| 125°   | 1538.3 | 1563.1 | 1599.0 | 1612.3 | 1617.9 |
| 127.5° | 1636.8 | 1663.3 | 1691.9 | 1710.7 | 1712.5 |
| 130°   | 1729.6 | 1760.0 | 1780.6 | 1801.5 | 1799.7 |
| 132.5° | 1824.2 | 1848.9 | 1869.6 | 1886.7 | 1884.9 |
| 135°   | 1903.8 | 1934.1 | 1950.9 | 1970.0 | 1966.3 |
| 137.5° | 1986.9 | 2009.6 | 2028.7 | 2047.5 | 2041.9 |
| 140°   | 2068.2 | 2083.5 | 2104.2 | 2121.2 | 2111.9 |
| 142.5° | 2136.6 | 2149.8 | 2174.3 | 2189.3 | 2180.0 |
| 145°   | 2208.5 | 2206.4 | 2238.6 | 2251.9 | 2242.4 |
| 147.5° | 2270.7 | 2265.1 | 2297.2 | 2306.7 | 2299.2 |
| 150°   | 2331.4 | 2318.2 | 2348.5 | 2359.7 | 2350.3 |
| 152.5° | 2382.4 | 2367.3 | 2395.6 | 2407.1 | 2393.8 |
| 155°   | 2431.6 | 2414.8 | 2437.4 | 2448.7 | 2433.6 |
| 157.5° | 2471.4 | 2456.3 | 2473.4 | 2486.6 | 2471.4 |
| 160°   | 2505.5 | 2494.1 | 2505.5 | 2516.8 | 2503.5 |
| 162.5° | 2535.6 | 2524.4 | 2533.8 | 2547.1 | 2530.0 |
| 165°   | 2562.2 | 2550.9 | 2556.6 | 2569.8 | 2556.6 |
| 167.5° | 2583.1 | 2571.6 | 2577.4 | 2590.7 | 2573.6 |
| 170°   | 2600.1 | 2588.7 | 2592.5 | 2605.7 | 2588.7 |
| 172.5° | 2611.4 | 2600.1 | 2603.9 | 2617.2 | 2600.1 |
| 175°   | 2620.8 | 2607.5 | 2611.4 | 2624.6 | 2605.7 |
| 177.5° | 2624.6 | 2611.4 | 2613.4 | 2626.6 | 2609.6 |
| 180°   | 2615.2 | 2615.2 | 2615.2 | 2615.2 | 2615.2 |

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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 | 7.61             | 8.39  | 8.65  | 9.44  | 10.84 | 7.17           | 7.95  | 8.21  | 9.00  | 10.40 |
|                 | 3H   | 9.27             | 9.97  | 10.32 | 11.02 | 12.45 | 8.79           | 9.48  | 9.83  | 10.54 | 11.96 |
|                 | 4H   | 9.86             | 10.52 | 10.92 | 11.57 | 13.01 | 9.37           | 10.03 | 10.43 | 11.09 | 12.52 |
|                 | 6H   | 10.25            | 10.86 | 11.32 | 11.92 | 13.37 | 9.76           | 10.37 | 10.83 | 11.43 | 12.88 |
|                 | 8H   | 10.36            | 10.94 | 11.43 | 12.01 | 13.45 | 9.87           | 10.44 | 10.94 | 11.52 | 12.96 |
|                 | 12H  | 10.40            | 10.96 | 11.48 | 12.02 | 13.49 | 9.90           | 10.46 | 10.98 | 11.52 | 12.99 |
| 4H              | 2H   | 8.07             | 8.73  | 9.13  | 9.78  | 11.22 | 7.71           | 8.38  | 8.78  | 9.43  | 10.86 |
|                 | 3H   | 9.93             | 10.48 | 11.00 | 11.56 | 13.01 | 9.52           | 10.08 | 10.60 | 11.16 | 12.60 |
|                 | 4H   | 10.64            | 11.15 | 11.72 | 12.22 | 13.69 | 10.22          | 10.73 | 11.30 | 11.80 | 13.27 |
|                 | 6H   | 11.15            | 11.59 | 12.24 | 12.68 | 14.15 | 10.73          | 11.16 | 11.82 | 12.26 | 13.72 |
|                 | 8H   | 11.30            | 11.71 | 12.39 | 12.80 | 14.27 | 10.87          | 11.28 | 11.96 | 12.37 | 13.85 |
|                 | 12H  | 11.37            | 11.74 | 12.48 | 12.84 | 14.33 | 10.93          | 11.30 | 12.04 | 12.40 | 13.88 |
| 8H              | 4H   | 10.83            | 11.24 | 11.92 | 12.33 | 13.80 | 10.46          | 10.87 | 11.55 | 11.95 | 13.43 |
|                 | 6H   | 11.46            | 11.80 | 12.57 | 12.93 | 14.40 | 11.08          | 11.42 | 12.20 | 12.55 | 14.03 |
|                 | 8H   | 11.68            | 11.98 | 12.80 | 13.09 | 14.58 | 11.30          | 11.59 | 12.42 | 12.71 | 14.20 |
|                 | 12H  | 11.81            | 12.07 | 12.93 | 13.18 | 14.71 | 11.41          | 11.67 | 12.53 | 12.78 | 14.31 |
| 12H             | 4H   | 10.81            | 11.18 | 11.92 | 12.28 | 13.76 | 10.45          | 10.82 | 11.56 | 11.92 | 13.40 |
|                 | 6H   | 11.49            | 11.79 | 12.61 | 12.90 | 14.39 | 11.13          | 11.42 | 12.24 | 12.53 | 14.03 |
|                 | 8H   | 11.73            | 11.99 | 12.85 | 13.10 | 14.63 | 11.36          | 11.62 | 12.48 | 12.73 | 14.26 |