

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: P916876

Luminaire Tested: DFN2DIP-PN4F0-060D090US930-FLLFLL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P916876  
REPORT IS A COMBINATION OF REPORTS P899703 AND P896497  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-PN4F0-060D090US930-FLLFLL  
Description: 4 foot, Pentagon Define Geo, with Direct Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

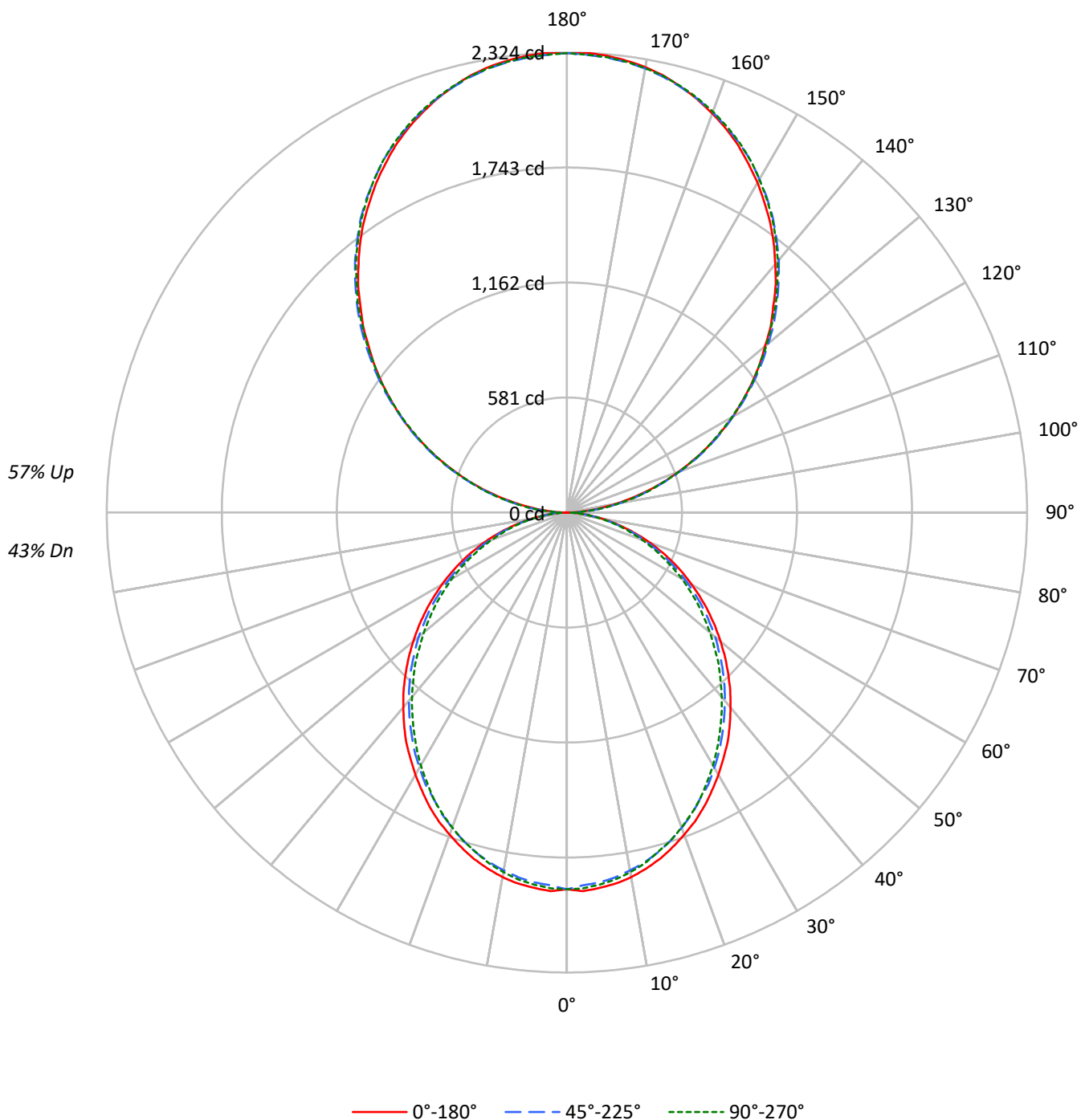
Lumens per Lamp: N/A  
Luminaire Lumens: 11336.7 lumens  
Efficiency: N/A  
Efficacy: 93.5 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 3.74' x L: 3.94' x H: 0.1')  
CIE Type: General Diffuse

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

TEST NUMBER: P916876

CATALOG NUMBER: DFN2DIP-PN4F0-060D090US930-FLLFLL

### Luminous Intensity Polar Plot



TEST NUMBER: P916876

CATALOG NUMBER: DFN2DIP-PN4F0-060D090US930-FLLFL

**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 | 64 | 64 | 64 | 49 | 49 | 49 |
| 1   | 96  | 92  | 88  | 85  | 88 | 84 | 81 | 78 | 69 | 67 | 65 | 56 | 54 | 53 | 44 | 43 | 42 |
| 2   | 88  | 80  | 74  | 69  | 80 | 73 | 68 | 64 | 61 | 57 | 54 | 49 | 47 | 44 | 38 | 37 | 35 |
| 3   | 80  | 70  | 63  | 57  | 73 | 65 | 58 | 53 | 54 | 49 | 45 | 44 | 40 | 37 | 34 | 32 | 30 |
| 4   | 73  | 62  | 55  | 49  | 66 | 57 | 50 | 45 | 48 | 43 | 39 | 39 | 35 | 32 | 30 | 28 | 26 |
| 5   | 67  | 56  | 47  | 42  | 61 | 51 | 44 | 39 | 43 | 37 | 33 | 35 | 31 | 28 | 27 | 25 | 22 |
| 6   | 62  | 50  | 42  | 36  | 56 | 46 | 39 | 34 | 38 | 33 | 29 | 31 | 27 | 24 | 25 | 22 | 20 |
| 7   | 57  | 45  | 37  | 31  | 52 | 41 | 34 | 29 | 35 | 29 | 25 | 29 | 24 | 21 | 23 | 20 | 18 |
| 8   | 53  | 41  | 33  | 28  | 48 | 38 | 31 | 26 | 32 | 26 | 23 | 26 | 22 | 19 | 21 | 18 | 16 |
| 9   | 49  | 37  | 30  | 25  | 45 | 34 | 28 | 23 | 29 | 24 | 20 | 24 | 20 | 17 | 19 | 16 | 14 |
| 10  | 46  | 34  | 27  | 22  | 42 | 31 | 25 | 21 | 27 | 22 | 18 | 22 | 18 | 15 | 18 | 15 | 13 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 1389 | 1389 | 1389 |
| 5°  | 1392 | 1370 | 1380 |
| 10° | 1380 | 1352 | 1361 |
| 15° | 1360 | 1330 | 1332 |
| 20° | 1333 | 1299 | 1303 |
| 25° | 1305 | 1262 | 1268 |
| 30° | 1271 | 1228 | 1225 |
| 35° | 1239 | 1188 | 1178 |
| 40° | 1199 | 1147 | 1134 |
| 45° | 1159 | 1106 | 1089 |
| 50° | 1116 | 1063 | 1037 |
| 55° | 1070 | 1014 | 990  |
| 60° | 1019 | 955  | 935  |
| 65° | 962  | 894  | 870  |
| 70° | 891  | 819  | 801  |
| 75° | 792  | 730  | 737  |
| 80° | 673  | 617  | 615  |
| 85° | 486  | 421  | 411  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 90°

Vertical Angle: 90°

Luminance: 1815 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 179.1   | 1.6       |
| 10°-20°   | 504.1   | 4.4       |
| 20°-30°   | 740.8   | 6.5       |
| 30°-40°   | 860.4   | 7.6       |
| 40°-50°   | 859.3   | 7.6       |
| 50°-60°   | 749.3   | 6.6       |
| 60°-70°   | 553.9   | 4.9       |
| 70°-80°   | 313.4   | 2.8       |
| 80°-90°   | 89.3    | 0.8       |
| 90°-100°  | 143.6   | 1.3       |
| 100°-110° | 456.3   | 4.0       |
| 110°-120° | 780.8   | 6.9       |
| 120°-130° | 1026.9  | 9.1       |
| 130°-140° | 1152.6  | 10.2      |
| 140°-150° | 1130.3  | 10.0      |
| 150°-160° | 948.2   | 8.4       |
| 160°-170° | 628.8   | 5.5       |
| 170°-180° | 219.8   | 1.9       |
| 0°-30°    | 1424.0  | 12.6      |
| 0°-40°    | 2284.3  | 20.1      |
| 0°-60°    | 3892.9  | 34.3      |
| 0°-90°    | 4849.5  | 42.8      |
| 90°-120°  | 1380.7  | 12.2      |
| 90°-150°  | 4690.5  | 41.4      |
| 90°-180°  | 6487.0  | 57.2      |
| 0°-180°   | 11336.7 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 1903 | 1903  | 1903 | 1903  | 1903 |      |
| 5°   | 1903 | 1896  | 1876 | 1891  | 1887 | 181  |
| 15°  | 1812 | 1801  | 1777 | 1785  | 1776 | 510  |
| 25°  | 1640 | 1625  | 1594 | 1598  | 1594 | 755  |
| 35°  | 1415 | 1397  | 1367 | 1356  | 1347 | 884  |
| 45°  | 1151 | 1138  | 1111 | 1091  | 1084 | 889  |
| 55°  | 871  | 860   | 838  | 816   | 807  | 779  |
| 65°  | 588  | 577   | 558  | 542   | 533  | 581  |
| 75°  | 307  | 304   | 295  | 284   | 287  | 328  |
| 85°  | 75   | 73    | 71   | 66    | 64   | 84   |
| 90°  | 2    | 25    | 69   | 64    | 66   | 11   |
| 95°  | 102  | 122   | 125  | 125   | 122  | 114  |
| 105° | 421  | 427   | 431  | 434   | 434  | 444  |
| 115° | 784  | 795   | 791  | 789   | 784  | 775  |
| 125° | 1140 | 1157  | 1152 | 1145  | 1143 | 1018 |
| 135° | 1474 | 1496  | 1500 | 1498  | 1492 | 1139 |
| 145° | 1790 | 1804  | 1815 | 1817  | 1809 | 1118 |
| 155° | 2046 | 2052  | 2058 | 2068  | 2062 | 942  |
| 165° | 2226 | 2224  | 2224 | 2238  | 2228 | 628  |
| 175° | 2316 | 2311  | 2307 | 2321  | 2309 | 220  |
| 180° | 2321 | 2321  | 2321 | 2321  | 2321 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 1903.4 | 1903.4 | 1903.4 | 1903.4 | 1903.4 |
| 2.5°   | 1914.5 | 1905.4 | 1885.1 | 1903.4 | 1899.9 |
| 5°     | 1903.4 | 1896.2 | 1876.0 | 1890.6 | 1887.1 |
| 7.5°   | 1890.6 | 1879.8 | 1859.5 | 1874.3 | 1870.6 |
| 10°    | 1870.6 | 1857.8 | 1835.8 | 1850.4 | 1844.9 |
| 12.5°  | 1843.1 | 1832.1 | 1810.2 | 1819.3 | 1815.7 |
| 15°    | 1811.9 | 1801.1 | 1777.2 | 1784.6 | 1775.5 |
| 17.5°  | 1773.5 | 1762.7 | 1738.8 | 1747.8 | 1738.8 |
| 20°    | 1731.4 | 1720.5 | 1694.8 | 1700.3 | 1693.1 |
| 22.5°  | 1689.5 | 1672.9 | 1649.0 | 1649.0 | 1645.4 |
| 25°    | 1639.9 | 1625.4 | 1594.2 | 1597.7 | 1594.2 |
| 27.5°  | 1584.9 | 1572.1 | 1548.4 | 1543.0 | 1533.9 |
| 30°    | 1530.2 | 1515.4 | 1488.1 | 1482.6 | 1475.2 |
| 32.5°  | 1471.5 | 1460.7 | 1431.3 | 1420.2 | 1412.9 |
| 35°    | 1414.9 | 1396.6 | 1367.3 | 1356.2 | 1347.0 |
| 37.5°  | 1350.8 | 1334.2 | 1305.0 | 1292.1 | 1283.0 |
| 40°    | 1284.9 | 1270.2 | 1240.9 | 1224.6 | 1217.2 |
| 42.5°  | 1220.8 | 1206.1 | 1177.0 | 1158.5 | 1147.6 |
| 45°    | 1151.4 | 1138.5 | 1110.9 | 1091.0 | 1083.5 |
| 47.5°  | 1083.5 | 1070.7 | 1041.5 | 1021.2 | 1010.3 |
| 50°    | 1012.1 | 1003.0 | 977.4  | 951.7  | 942.6  |
| 52.5°  | 942.6  | 929.8  | 906.0  | 885.9  | 873.1  |
| 55°    | 871.3  | 860.2  | 838.3  | 816.4  | 807.2  |
| 57.5°  | 799.9  | 790.8  | 766.9  | 744.9  | 737.5  |
| 60°    | 728.4  | 721.2  | 695.6  | 675.4  | 669.9  |
| 62.5°  | 658.8  | 646.0  | 627.8  | 609.5  | 602.2  |
| 65°    | 587.6  | 576.6  | 558.3  | 541.8  | 532.6  |
| 67.5°  | 514.4  | 505.1  | 488.8  | 476.0  | 468.6  |
| 70°    | 446.6  | 439.3  | 422.7  | 409.9  | 402.8  |
| 72.5°  | 377.1  | 369.7  | 360.6  | 347.8  | 342.3  |
| 75°    | 307.4  | 303.9  | 294.6  | 283.7  | 287.4  |
| 77.5°  | 245.2  | 237.9  | 234.2  | 228.8  | 223.3  |
| 80°    | 183.1  | 181.2  | 177.5  | 172.0  | 168.4  |
| 82.5°  | 124.5  | 124.5  | 122.7  | 115.4  | 115.4  |
| 85°    | 74.9   | 73.2   | 71.4   | 65.8   | 64.1   |
| 87.5°  | 33.0   | 29.4   | 25.6   | 20.2   | 18.3   |
| 90°    | 2.1    | 25.2   | 68.6   | 64.3   | 66.4   |
| 92.5°  | 43.4   | 58.8   | 60.9   | 62.9   | 62.9   |
| 95°    | 102.2  | 121.7  | 125.2  | 125.2  | 121.7  |
| 97.5°  | 170.0  | 188.2  | 195.9  | 195.9  | 195.9  |
| 100°   | 248.3  | 264.5  | 270.0  | 270.0  | 268.0  |
| 102.5° | 330.9  | 342.8  | 350.5  | 352.6  | 350.5  |
| 105°   | 421.2  | 426.7  | 431.0  | 434.5  | 434.5  |
| 107.5° | 510.7  | 519.1  | 519.1  | 520.5  | 510.7  |
| 110°   | 597.5  | 608.7  | 608.7  | 608.7  | 603.1  |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 691.2  | 703.1  | 701.0  | 695.4  | 691.2  |
| 115°   | 783.6  | 794.8  | 791.2  | 789.2  | 783.6  |
| 117.5° | 875.2  | 890.6  | 880.8  | 875.2  | 869.6  |
| 120°   | 967.6  | 982.9  | 967.6  | 967.6  | 961.2  |
| 122.5° | 1051.5 | 1071.1 | 1061.4 | 1055.7 | 1051.5 |
| 125°   | 1139.7 | 1157.2 | 1151.6 | 1145.2 | 1143.2 |
| 127.5° | 1225.7 | 1247.4 | 1239.7 | 1231.3 | 1225.7 |
| 130°   | 1306.2 | 1331.4 | 1327.9 | 1323.6 | 1316.0 |
| 132.5° | 1396.4 | 1416.0 | 1417.4 | 1407.6 | 1402.1 |
| 135°   | 1474.1 | 1495.7 | 1500.0 | 1497.9 | 1492.3 |
| 137.5° | 1560.8 | 1578.3 | 1581.8 | 1580.5 | 1572.1 |
| 140°   | 1637.1 | 1654.6 | 1664.3 | 1664.3 | 1656.7 |
| 142.5° | 1715.5 | 1732.9 | 1738.5 | 1740.7 | 1732.9 |
| 145°   | 1789.7 | 1803.6 | 1814.8 | 1816.9 | 1809.2 |
| 147.5° | 1856.1 | 1873.6 | 1882.0 | 1885.5 | 1877.8 |
| 150°   | 1924.7 | 1936.6 | 1944.2 | 1950.5 | 1944.2 |
| 152.5° | 1985.5 | 1997.4 | 2007.2 | 2014.9 | 2007.2 |
| 155°   | 2046.4 | 2051.9 | 2058.3 | 2068.1 | 2061.8 |
| 157.5° | 2098.8 | 2103.1 | 2106.6 | 2120.5 | 2110.7 |
| 160°   | 2145.7 | 2149.9 | 2152.1 | 2163.9 | 2155.5 |
| 162.5° | 2189.1 | 2189.1 | 2191.2 | 2204.5 | 2194.7 |
| 165°   | 2226.2 | 2224.1 | 2224.1 | 2238.1 | 2228.3 |
| 167.5° | 2259.8 | 2253.5 | 2253.5 | 2267.4 | 2257.6 |
| 170°   | 2285.0 | 2279.3 | 2277.3 | 2291.2 | 2279.3 |
| 172.5° | 2302.4 | 2296.9 | 2294.7 | 2308.8 | 2296.9 |
| 175°   | 2316.4 | 2310.8 | 2306.6 | 2320.7 | 2308.8 |
| 177.5° | 2324.1 | 2318.5 | 2314.3 | 2326.2 | 2314.3 |
| 180°   | 2320.7 | 2320.7 | 2320.7 | 2320.7 | 2320.7 |

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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 | 7.71             | 8.51  | 8.73  | 9.54  | 10.91 | 7.27           | 8.07  | 8.29  | 9.10  | 10.47 |
|                 | 3H   | 9.37             | 10.09 | 10.40 | 11.12 | 12.51 | 8.89           | 9.60  | 9.91  | 10.64 | 12.03 |
|                 | 4H   | 9.96             | 10.64 | 11.00 | 11.68 | 13.07 | 9.47           | 10.15 | 10.51 | 11.19 | 12.59 |
|                 | 6H   | 10.36            | 10.98 | 11.41 | 12.02 | 13.43 | 9.87           | 10.49 | 10.91 | 11.53 | 12.94 |
|                 | 8H   | 10.46            | 11.06 | 11.52 | 12.11 | 13.52 | 9.97           | 10.56 | 11.02 | 11.62 | 13.03 |
|                 | 12H  | 10.51            | 11.08 | 11.57 | 12.13 | 13.56 | 10.01          | 10.58 | 11.07 | 11.63 | 13.06 |
| 4H              | 2H   | 8.17             | 8.85  | 9.21  | 9.88  | 11.28 | 7.82           | 8.50  | 8.86  | 9.53  | 10.93 |
|                 | 3H   | 10.03            | 10.60 | 11.08 | 11.66 | 13.07 | 9.63           | 10.20 | 10.68 | 11.26 | 12.67 |
|                 | 4H   | 10.74            | 11.26 | 11.80 | 12.32 | 13.75 | 10.33          | 10.85 | 11.39 | 11.90 | 13.34 |
|                 | 6H   | 11.26            | 11.71 | 12.33 | 12.79 | 14.21 | 10.83          | 11.28 | 11.90 | 12.36 | 13.79 |
|                 | 8H   | 11.41            | 11.83 | 12.48 | 12.90 | 14.34 | 10.98          | 11.40 | 12.05 | 12.47 | 13.91 |
|                 | 12H  | 11.48            | 11.86 | 12.57 | 12.94 | 14.39 | 11.04          | 11.42 | 12.13 | 12.50 | 13.95 |
| 8H              | 4H   | 10.94            | 11.35 | 12.01 | 12.43 | 13.87 | 10.57          | 10.98 | 11.64 | 12.05 | 13.50 |
|                 | 6H   | 11.57            | 11.91 | 12.66 | 13.03 | 14.47 | 11.19          | 11.54 | 12.28 | 12.65 | 14.09 |
|                 | 8H   | 11.79            | 12.09 | 12.89 | 13.19 | 14.65 | 11.41          | 11.71 | 12.51 | 12.81 | 14.27 |
|                 | 12H  | 11.92            | 12.19 | 13.03 | 13.28 | 14.78 | 11.52          | 11.79 | 12.62 | 12.88 | 14.38 |
| 12H             | 4H   | 10.92            | 11.30 | 12.01 | 12.38 | 13.83 | 10.56          | 10.93 | 11.64 | 12.02 | 13.47 |
|                 | 6H   | 11.60            | 11.90 | 12.70 | 13.00 | 14.46 | 11.23          | 11.54 | 12.33 | 12.63 | 14.09 |
|                 | 8H   | 11.84            | 12.11 | 12.94 | 13.20 | 14.70 | 11.47          | 11.73 | 12.57 | 12.83 | 14.33 |