

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: P922372

Luminaire Tested: DFN2DIP-PN4F0-070D100US940-FLLFLL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P922372  
REPORT IS A COMBINATION OF REPORTS P899723 AND P896497  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-PN4F0-070D100US940-FLLFLL  
Description: 4 foot, Pentagon Define Geo, with Direct Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

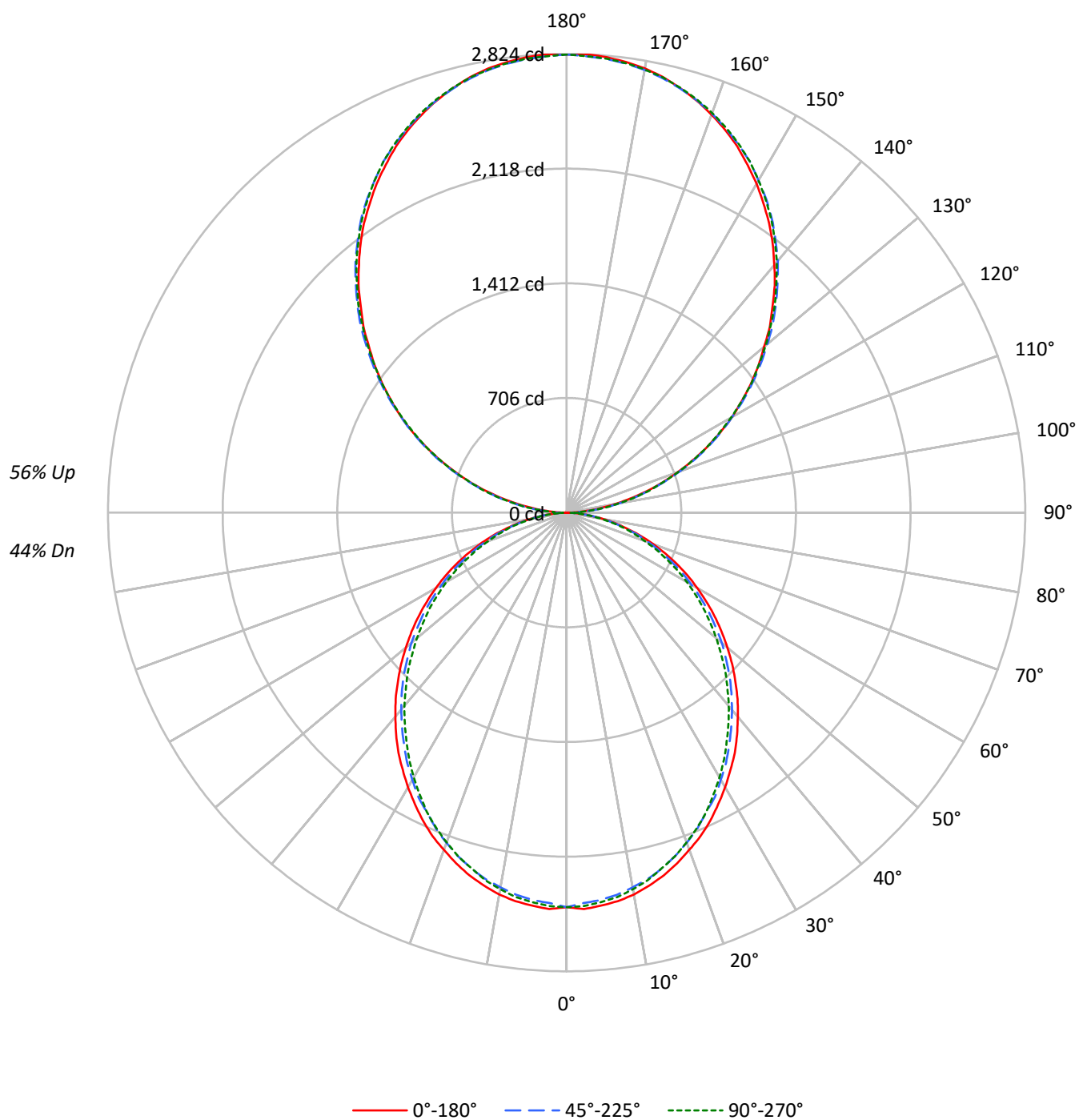
Lumens per Lamp: N/A  
Luminaire Lumens: 14071.2 lumens  
Efficiency: N/A  
Efficacy: 99.4 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 3.74' x L: 3.94' x H: 0.1')  
CIE Type: General Diffuse

Input Watts (W): 141.6  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9789  
Total Harmonic Distortion (THDi): 0.074  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT

TEST NUMBER: P922372

CATALOG NUMBER: DFN2DIP-PN4F0-070D100US940-FLLFLL

### Luminous Intensity Polar Plot



TEST NUMBER: P922372

CATALOG NUMBER: DFN2DIP-PN4F0-070D100US940-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   | 106 | 106 | 106 | 106 | 97 | 97 | 97 | 97 | 80 | 80 | 80 | 65 | 65 | 65 | 51 | 51 | 51 |
| 1   | 96  | 92  | 88  | 85  | 88 | 84 | 81 | 78 | 70 | 68 | 66 | 57 | 55 | 54 | 45 | 44 | 43 |
| 2   | 88  | 80  | 74  | 69  | 80 | 74 | 69 | 64 | 61 | 58 | 54 | 50 | 47 | 45 | 39 | 38 | 36 |
| 3   | 80  | 71  | 63  | 58  | 73 | 65 | 59 | 54 | 54 | 49 | 46 | 44 | 41 | 38 | 35 | 33 | 31 |
| 4   | 73  | 63  | 55  | 49  | 67 | 58 | 51 | 45 | 48 | 43 | 39 | 39 | 36 | 33 | 31 | 29 | 26 |
| 5   | 67  | 56  | 48  | 42  | 61 | 51 | 44 | 39 | 43 | 38 | 33 | 35 | 31 | 28 | 28 | 25 | 23 |
| 6   | 62  | 50  | 42  | 36  | 56 | 46 | 39 | 34 | 39 | 33 | 29 | 32 | 28 | 25 | 25 | 23 | 20 |
| 7   | 57  | 45  | 37  | 32  | 52 | 42 | 35 | 30 | 35 | 30 | 26 | 29 | 25 | 22 | 23 | 20 | 18 |
| 8   | 53  | 41  | 33  | 28  | 48 | 38 | 31 | 26 | 32 | 27 | 23 | 26 | 22 | 19 | 21 | 18 | 16 |
| 9   | 49  | 37  | 30  | 25  | 45 | 35 | 28 | 23 | 29 | 24 | 20 | 24 | 20 | 17 | 20 | 17 | 15 |
| 10  | 46  | 34  | 27  | 22  | 42 | 32 | 25 | 21 | 27 | 22 | 18 | 22 | 19 | 16 | 18 | 15 | 13 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 1773 | 1773 | 1773 |
| 5°  | 1776 | 1748 | 1760 |
| 10° | 1761 | 1725 | 1737 |
| 15° | 1735 | 1697 | 1700 |
| 20° | 1700 | 1658 | 1662 |
| 25° | 1666 | 1611 | 1618 |
| 30° | 1622 | 1567 | 1563 |
| 35° | 1581 | 1516 | 1504 |
| 40° | 1530 | 1463 | 1448 |
| 45° | 1479 | 1411 | 1390 |
| 50° | 1424 | 1357 | 1324 |
| 55° | 1365 | 1293 | 1263 |
| 60° | 1300 | 1218 | 1193 |
| 65° | 1228 | 1140 | 1110 |
| 70° | 1137 | 1045 | 1022 |
| 75° | 1011 | 932  | 941  |
| 80° | 858  | 788  | 784  |
| 85° | 621  | 538  | 525  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 90°

Vertical Angle: 90°

Luminance: 2209 cd/sqm

TEST NUMBER: P922372

CATALOG NUMBER: DFN2DIP-PN4F0-070D100US940-FLLFLL

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 228.6   | 1.6       |
| 10°-20°   | 643.2   | 4.6       |
| 20°-30°   | 945.2   | 6.7       |
| 30°-40°   | 1097.8  | 7.8       |
| 40°-50°   | 1096.5  | 7.8       |
| 50°-60°   | 956.1   | 6.8       |
| 60°-70°   | 706.8   | 5.0       |
| 70°-80°   | 399.9   | 2.8       |
| 80°-90°   | 113.6   | 0.8       |
| 90°-100°  | 174.5   | 1.2       |
| 100°-110° | 554.5   | 3.9       |
| 110°-120° | 948.9   | 6.7       |
| 120°-130° | 1247.9  | 8.9       |
| 130°-140° | 1400.8  | 10.0      |
| 140°-150° | 1373.6  | 9.8       |
| 150°-160° | 1152.3  | 8.2       |
| 160°-170° | 764.1   | 5.4       |
| 170°-180° | 267.1   | 1.9       |
| 0°-30°    | 1817.0  | 12.9      |
| 0°-40°    | 2914.9  | 20.7      |
| 0°-60°    | 4967.4  | 35.3      |
| 0°-90°    | 6187.6  | 44.0      |
| 90°-120°  | 1677.9  | 11.9      |
| 90°-150°  | 5700.1  | 40.5      |
| 90°-180°  | 7884.0  | 56.0      |
| 0°-180°   | 14071.2 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 2429 | 2429  | 2429 | 2429  | 2429 |      |
| 5°   | 2429 | 2420  | 2394 | 2412  | 2408 | 231  |
| 15°  | 2312 | 2298  | 2268 | 2277  | 2266 | 651  |
| 25°  | 2093 | 2074  | 2034 | 2039  | 2034 | 963  |
| 35°  | 1805 | 1782  | 1745 | 1730  | 1719 | 1127 |
| 45°  | 1469 | 1453  | 1418 | 1392  | 1383 | 1134 |
| 55°  | 1112 | 1098  | 1070 | 1042  | 1030 | 994  |
| 65°  | 750  | 736   | 712  | 691   | 680  | 741  |
| 75°  | 392  | 388   | 376  | 362   | 367  | 419  |
| 85°  | 96   | 94    | 91   | 84    | 82   | 107  |
| 90°  | 3    | 31    | 83   | 78    | 81   | 14   |
| 95°  | 124  | 148   | 152  | 152   | 148  | 138  |
| 105° | 512  | 519   | 524  | 528   | 528  | 540  |
| 115° | 952  | 966   | 962  | 959   | 952  | 942  |
| 125° | 1385 | 1406  | 1400 | 1392  | 1389 | 1238 |
| 135° | 1791 | 1818  | 1823 | 1820  | 1814 | 1385 |
| 145° | 2175 | 2192  | 2206 | 2208  | 2199 | 1359 |
| 155° | 2487 | 2494  | 2501 | 2513  | 2506 | 1145 |
| 165° | 2705 | 2703  | 2703 | 2720  | 2708 | 763  |
| 175° | 2815 | 2808  | 2803 | 2820  | 2806 | 267  |
| 180° | 2820 | 2820  | 2820 | 2820  | 2820 |      |

TEST NUMBER: P922372

CATALOG NUMBER: DFN2DIP-PN4F0-070D100US940-FLLFL

**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 2428.8 | 2428.8 | 2428.8 | 2428.8 | 2428.8 |
| 2.5°   | 2442.9 | 2431.2 | 2405.5 | 2428.8 | 2424.3 |
| 5°     | 2428.8 | 2419.7 | 2393.9 | 2412.4 | 2408.0 |
| 7.5°   | 2412.4 | 2398.5 | 2372.8 | 2391.7 | 2386.9 |
| 10°    | 2386.9 | 2370.5 | 2342.5 | 2361.2 | 2354.2 |
| 12.5°  | 2351.7 | 2337.9 | 2309.9 | 2321.5 | 2316.8 |
| 15°    | 2312.1 | 2298.2 | 2267.7 | 2277.2 | 2265.5 |
| 17.5°  | 2263.0 | 2249.2 | 2218.7 | 2230.3 | 2218.7 |
| 20°    | 2209.2 | 2195.4 | 2162.7 | 2169.6 | 2160.4 |
| 22.5°  | 2155.7 | 2134.7 | 2104.2 | 2104.2 | 2099.4 |
| 25°    | 2092.6 | 2073.9 | 2034.3 | 2038.8 | 2034.3 |
| 27.5°  | 2022.4 | 2006.1 | 1975.9 | 1968.9 | 1957.2 |
| 30°    | 1952.6 | 1933.7 | 1898.8 | 1891.9 | 1882.4 |
| 32.5°  | 1877.7 | 1863.9 | 1826.4 | 1812.3 | 1802.9 |
| 35°    | 1805.4 | 1782.1 | 1744.6 | 1730.5 | 1718.9 |
| 37.5°  | 1723.6 | 1702.5 | 1665.1 | 1648.8 | 1637.1 |
| 40°    | 1639.6 | 1620.8 | 1583.3 | 1562.5 | 1553.1 |
| 42.5°  | 1557.8 | 1539.0 | 1501.8 | 1478.3 | 1464.4 |
| 45°    | 1469.1 | 1452.8 | 1417.6 | 1392.0 | 1382.6 |
| 47.5°  | 1382.6 | 1366.3 | 1328.8 | 1303.1 | 1289.2 |
| 50°    | 1291.5 | 1279.8 | 1247.1 | 1214.4 | 1202.7 |
| 52.5°  | 1202.7 | 1186.4 | 1156.2 | 1130.4 | 1114.0 |
| 55°    | 1111.8 | 1097.7 | 1069.7 | 1041.7 | 1030.0 |
| 57.5°  | 1020.7 | 1009.0 | 978.5  | 950.5  | 941.1  |
| 60°    | 929.4  | 920.2  | 887.6  | 861.8  | 854.9  |
| 62.5°  | 840.7  | 824.4  | 801.1  | 777.8  | 768.4  |
| 65°    | 749.8  | 735.7  | 712.4  | 691.3  | 679.7  |
| 67.5°  | 656.4  | 644.5  | 623.7  | 607.3  | 597.9  |
| 70°    | 569.9  | 560.5  | 539.4  | 523.1  | 513.9  |
| 72.5°  | 481.2  | 471.8  | 460.1  | 443.8  | 436.8  |
| 75°    | 392.3  | 387.8  | 375.9  | 362.0  | 366.8  |
| 77.5°  | 313.0  | 303.5  | 298.8  | 291.9  | 285.0  |
| 80°    | 233.6  | 231.2  | 226.5  | 219.5  | 214.8  |
| 82.5°  | 158.8  | 158.8  | 156.6  | 147.2  | 147.2  |
| 85°    | 95.7   | 93.5   | 91.2   | 84.0   | 81.8   |
| 87.5°  | 42.1   | 37.5   | 32.7   | 25.8   | 23.3   |
| 90°    | 2.6    | 30.6   | 83.3   | 78.2   | 80.8   |
| 92.5°  | 52.7   | 71.4   | 74.0   | 76.5   | 76.5   |
| 95°    | 124.1  | 147.9  | 152.2  | 152.2  | 147.9  |
| 97.5°  | 206.6  | 228.7  | 238.1  | 238.1  | 238.1  |
| 100°   | 301.8  | 321.4  | 328.1  | 328.1  | 325.7  |
| 102.5° | 402.2  | 416.6  | 426.0  | 428.5  | 426.0  |
| 105°   | 511.8  | 518.6  | 523.7  | 528.0  | 528.0  |
| 107.5° | 620.6  | 630.9  | 630.9  | 632.6  | 620.6  |
| 110°   | 726.1  | 739.7  | 739.7  | 739.7  | 732.9  |

TEST NUMBER: P922372

CATALOG NUMBER: DFN2DIP-PN4F0-070D100US940-FLLFLL

**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 840.0  | 854.4  | 851.9  | 845.1  | 840.0  |
| 115°   | 952.3  | 965.8  | 961.6  | 959.0  | 952.3  |
| 117.5° | 1063.6 | 1082.4 | 1070.4 | 1063.6 | 1056.8 |
| 120°   | 1175.8 | 1194.5 | 1175.8 | 1175.8 | 1168.2 |
| 122.5° | 1277.8 | 1301.6 | 1289.8 | 1283.0 | 1277.8 |
| 125°   | 1385.0 | 1406.2 | 1399.5 | 1391.8 | 1389.3 |
| 127.5° | 1489.6 | 1515.9 | 1506.5 | 1496.4 | 1489.6 |
| 130°   | 1587.3 | 1617.9 | 1613.7 | 1608.6 | 1599.3 |
| 132.5° | 1697.0 | 1720.8 | 1722.5 | 1710.7 | 1703.8 |
| 135°   | 1791.4 | 1817.8 | 1822.8 | 1820.3 | 1813.5 |
| 137.5° | 1896.8 | 1918.1 | 1922.3 | 1920.7 | 1910.4 |
| 140°   | 1989.5 | 2010.7 | 2022.7 | 2022.7 | 2013.3 |
| 142.5° | 2084.7 | 2106.0 | 2112.7 | 2115.3 | 2106.0 |
| 145°   | 2174.8 | 2191.8 | 2205.5 | 2208.0 | 2198.6 |
| 147.5° | 2255.6 | 2276.9 | 2287.1 | 2291.3 | 2282.0 |
| 150°   | 2339.0 | 2353.4 | 2362.8 | 2370.3 | 2362.8 |
| 152.5° | 2412.9 | 2427.3 | 2439.3 | 2448.6 | 2439.3 |
| 155°   | 2486.9 | 2493.7 | 2501.3 | 2513.2 | 2505.5 |
| 157.5° | 2550.6 | 2555.7 | 2560.0 | 2577.0 | 2565.1 |
| 160°   | 2607.6 | 2612.7 | 2615.2 | 2629.7 | 2619.5 |
| 162.5° | 2660.3 | 2660.3 | 2662.8 | 2679.0 | 2667.1 |
| 165°   | 2705.4 | 2702.8 | 2702.8 | 2719.8 | 2707.9 |
| 167.5° | 2746.2 | 2738.5 | 2738.5 | 2755.6 | 2743.6 |
| 170°   | 2776.8 | 2770.0 | 2767.4 | 2784.5 | 2770.0 |
| 172.5° | 2798.0 | 2791.2 | 2788.6 | 2805.7 | 2791.2 |
| 175°   | 2815.0 | 2808.3 | 2803.2 | 2820.1 | 2805.7 |
| 177.5° | 2824.4 | 2817.6 | 2812.5 | 2826.9 | 2812.5 |
| 180°   | 2820.1 | 2820.1 | 2820.1 | 2820.1 | 2820.1 |

TEST NUMBER: P922372

CATALOG NUMBER: DFN2DIP-PN4F0-070D100US940-FLLFLL

**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 | 8.68             | 9.49  | 9.69  | 10.51 | 11.86 | 8.24           | 9.05  | 9.25  | 10.07 | 11.42 |
|                 | 3H   | 10.34            | 11.07 | 11.36 | 12.09 | 13.47 | 9.86           | 10.58 | 10.87 | 11.61 | 12.98 |
|                 | 4H   | 10.93            | 11.62 | 11.96 | 12.65 | 14.03 | 10.44          | 11.13 | 11.47 | 12.16 | 13.54 |
|                 | 6H   | 11.33            | 11.96 | 12.37 | 13.00 | 14.39 | 10.84          | 11.47 | 11.88 | 12.50 | 13.90 |
|                 | 8H   | 11.43            | 12.04 | 12.48 | 13.09 | 14.48 | 10.94          | 11.54 | 11.99 | 12.59 | 13.98 |
|                 | 12H  | 11.48            | 12.05 | 12.53 | 13.10 | 14.51 | 10.98          | 11.55 | 12.03 | 12.60 | 14.01 |
| 4H              | 2H   | 9.14             | 9.83  | 10.17 | 10.85 | 12.24 | 8.79           | 9.47  | 9.82  | 10.50 | 11.89 |
|                 | 3H   | 11.00            | 11.58 | 12.05 | 12.63 | 14.03 | 10.60          | 11.17 | 11.64 | 12.23 | 13.63 |
|                 | 4H   | 11.72            | 12.24 | 12.77 | 13.29 | 14.71 | 11.30          | 11.82 | 12.35 | 12.87 | 14.29 |
|                 | 6H   | 12.23            | 12.68 | 13.29 | 13.76 | 15.17 | 11.81          | 12.26 | 12.87 | 13.33 | 14.74 |
|                 | 8H   | 12.38            | 12.80 | 13.44 | 13.87 | 15.30 | 11.95          | 12.38 | 13.01 | 13.44 | 14.87 |
|                 | 12H  | 12.45            | 12.84 | 13.53 | 13.91 | 15.35 | 12.01          | 12.40 | 13.09 | 13.47 | 14.91 |
| 8H              | 4H   | 11.91            | 12.33 | 12.97 | 13.40 | 14.82 | 11.54          | 11.96 | 12.60 | 13.03 | 14.45 |
|                 | 6H   | 12.54            | 12.89 | 13.63 | 14.00 | 15.42 | 12.17          | 12.51 | 13.25 | 13.62 | 15.05 |
|                 | 8H   | 12.76            | 13.07 | 13.86 | 14.16 | 15.61 | 12.38          | 12.69 | 13.47 | 13.78 | 15.22 |
|                 | 12H  | 12.90            | 13.16 | 13.99 | 14.25 | 15.74 | 12.49          | 12.76 | 13.59 | 13.85 | 15.33 |
| 12H             | 4H   | 11.89            | 12.27 | 12.97 | 13.35 | 14.79 | 11.53          | 11.91 | 12.61 | 12.99 | 14.42 |
|                 | 6H   | 12.57            | 12.88 | 13.66 | 13.97 | 15.41 | 12.21          | 12.51 | 13.30 | 13.60 | 15.05 |
|                 | 8H   | 12.81            | 13.08 | 13.91 | 14.17 | 15.65 | 12.44          | 12.71 | 13.54 | 13.80 | 15.28 |