

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: P908721

Luminaire Tested: DFN2DIP-PN4F0-070D070US840-FLLONL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P908721  
REPORT IS A COMBINATION OF REPORTS P901189 AND P898053  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-PN4F0-070D070US840-FLLONL  
Description: 4 foot, Pentagon Define Geo, with Direct Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

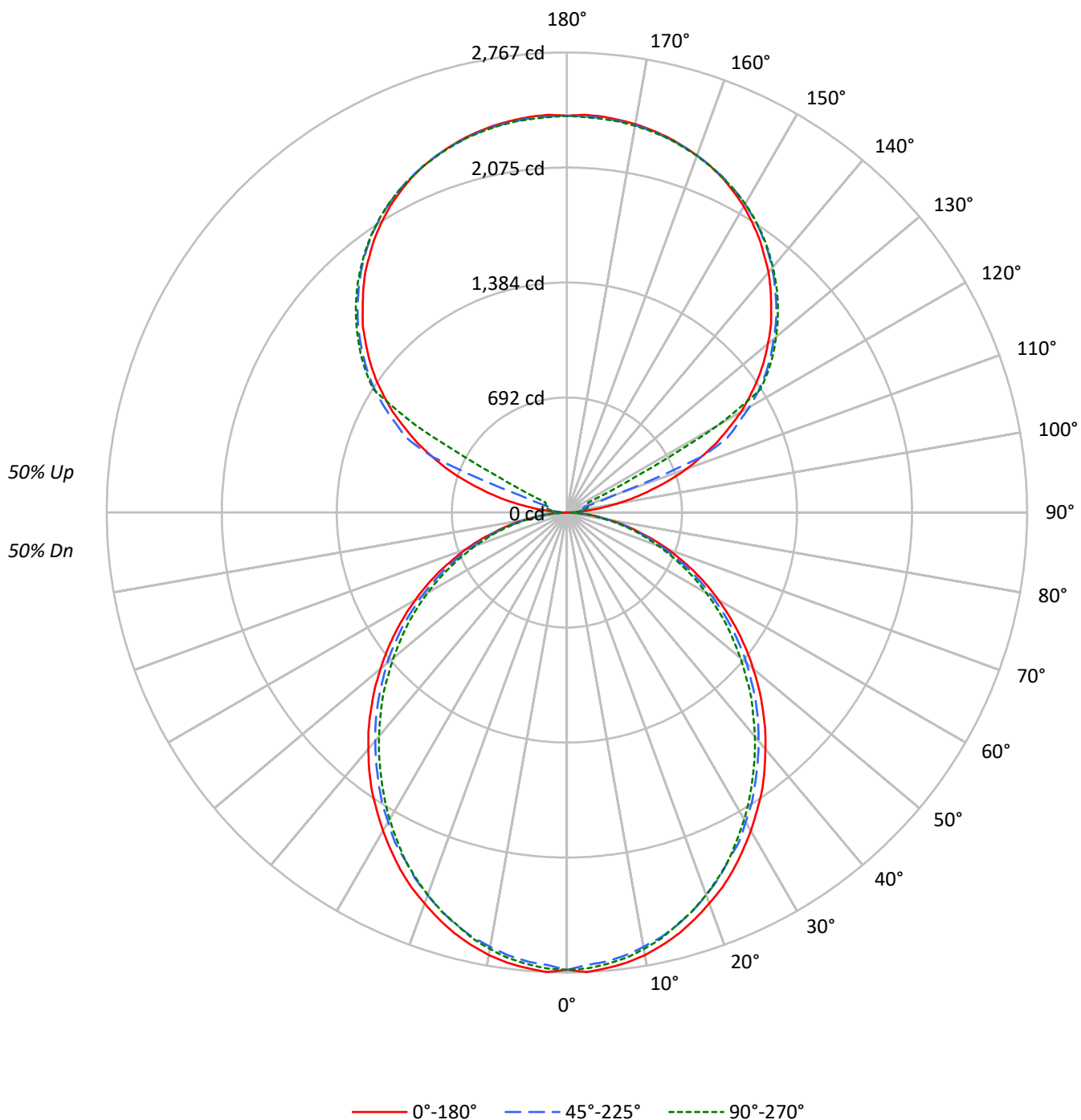
Lumens per Lamp: N/A  
Luminaire Lumens: 13996.8 lumens  
Efficiency: N/A  
Efficacy: 117.4 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 3.74' x L: 3.94' x H: 0.1')  
CIE Type: General Diffuse

Input Watts (W): 119.2  
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

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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   | 107 | 107 | 107 | 107 | 99 | 99 | 99 | 99 | 83 | 83 | 83 | 69 | 69 | 69 | 56 | 56 | 56 |
| 1   | 98  | 93  | 90  | 86  | 90 | 86 | 83 | 80 | 73 | 71 | 68 | 61 | 59 | 58 | 50 | 48 | 47 |
| 2   | 89  | 82  | 75  | 70  | 82 | 76 | 70 | 66 | 64 | 60 | 57 | 53 | 51 | 48 | 44 | 42 | 40 |
| 3   | 81  | 72  | 64  | 59  | 75 | 66 | 60 | 55 | 56 | 52 | 48 | 47 | 44 | 41 | 39 | 36 | 34 |
| 4   | 74  | 64  | 56  | 50  | 68 | 59 | 52 | 47 | 50 | 45 | 41 | 42 | 38 | 35 | 35 | 32 | 29 |
| 5   | 68  | 57  | 48  | 42  | 63 | 53 | 45 | 40 | 45 | 39 | 35 | 38 | 34 | 30 | 31 | 28 | 26 |
| 6   | 63  | 51  | 43  | 37  | 58 | 47 | 40 | 35 | 40 | 35 | 31 | 34 | 30 | 27 | 28 | 25 | 23 |
| 7   | 58  | 46  | 38  | 32  | 53 | 43 | 36 | 30 | 37 | 31 | 27 | 31 | 27 | 23 | 26 | 23 | 20 |
| 8   | 54  | 42  | 34  | 29  | 50 | 39 | 32 | 27 | 33 | 28 | 24 | 28 | 24 | 21 | 24 | 20 | 18 |
| 9   | 50  | 38  | 30  | 25  | 46 | 35 | 29 | 24 | 31 | 25 | 21 | 26 | 22 | 19 | 22 | 19 | 16 |
| 10  | 47  | 35  | 28  | 23  | 43 | 33 | 26 | 22 | 28 | 23 | 19 | 24 | 20 | 17 | 20 | 17 | 15 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 2008 | 2008 | 2008 |
| 5°  | 2011 | 1980 | 1994 |
| 10° | 1995 | 1954 | 1967 |
| 15° | 1965 | 1922 | 1925 |
| 20° | 1926 | 1877 | 1882 |
| 25° | 1886 | 1824 | 1833 |
| 30° | 1837 | 1775 | 1770 |
| 35° | 1790 | 1716 | 1703 |
| 40° | 1732 | 1657 | 1639 |
| 45° | 1675 | 1598 | 1574 |
| 50° | 1612 | 1536 | 1499 |
| 55° | 1546 | 1465 | 1430 |
| 60° | 1472 | 1379 | 1351 |
| 65° | 1391 | 1291 | 1257 |
| 70° | 1288 | 1184 | 1157 |
| 75° | 1144 | 1056 | 1065 |
| 80° | 972  | 892  | 888  |
| 85° | 704  | 609  | 594  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°  
Vertical Angle: 45°  
Luminance: 1675 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 258.9   | 1.8       |
| 10°-20°   | 728.4   | 5.2       |
| 20°-30°   | 1070.5  | 7.6       |
| 30°-40°   | 1243.3  | 8.9       |
| 40°-50°   | 1241.7  | 8.9       |
| 50°-60°   | 1082.8  | 7.7       |
| 60°-70°   | 800.4   | 5.7       |
| 70°-80°   | 452.9   | 3.2       |
| 80°-90°   | 123.7   | 0.9       |
| 90°-100°  | 78.7    | 0.6       |
| 100°-110° | 293.3   | 2.1       |
| 110°-120° | 777.8   | 5.6       |
| 120°-130° | 1290.0  | 9.2       |
| 130°-140° | 1370.3  | 9.8       |
| 140°-150° | 1273.5  | 9.1       |
| 150°-160° | 1023.9  | 7.3       |
| 160°-170° | 659.7   | 4.7       |
| 170°-180° | 227.1   | 1.6       |
| 0°-30°    | 2057.8  | 14.7      |
| 0°-40°    | 3301.1  | 23.6      |
| 0°-60°    | 5625.6  | 40.2      |
| 0°-90°    | 7002.6  | 50.0      |
| 90°-120°  | 1149.7  | 8.2       |
| 90°-150°  | 5083.5  | 36.3      |
| 90°-180°  | 6994.0  | 50.0      |
| 0°-180°   | 13996.8 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 2751 | 2751  | 2751 | 2751  | 2751 |      |
| 5°   | 2751 | 2740  | 2711 | 2732  | 2727 | 261  |
| 15°  | 2618 | 2603  | 2568 | 2579  | 2566 | 737  |
| 25°  | 2370 | 2349  | 2304 | 2309  | 2304 | 1090 |
| 35°  | 2045 | 2018  | 1976 | 1960  | 1947 | 1277 |
| 45°  | 1664 | 1645  | 1605 | 1576  | 1566 | 1284 |
| 55°  | 1259 | 1243  | 1211 | 1180  | 1166 | 1126 |
| 65°  | 849  | 833   | 807  | 783   | 770  | 840  |
| 75°  | 444  | 439   | 426  | 410   | 415  | 474  |
| 85°  | 108  | 106   | 103  | 95    | 93   | 121  |
| 90°  | 2    | 21    | 34   | 43    | 47   | 13   |
| 95°  | 112  | 55    | 67   | 76    | 74   | 133  |
| 105° | 525  | 577   | 105  | 124   | 131  | 561  |
| 115° | 993  | 1022  | 1065 | 266   | 142  | 977  |
| 125° | 1403 | 1426  | 1459 | 1471  | 1476 | 1252 |
| 135° | 1737 | 1764  | 1780 | 1797  | 1794 | 1342 |
| 145° | 2015 | 2013  | 2042 | 2054  | 2046 | 1260 |
| 155° | 2218 | 2203  | 2224 | 2234  | 2220 | 1022 |
| 165° | 2337 | 2327  | 2332 | 2344  | 2332 | 660  |
| 175° | 2391 | 2379  | 2382 | 2394  | 2377 | 228  |
| 180° | 2386 | 2386  | 2386 | 2386  | 2386 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 2750.6 | 2750.6 | 2750.6 | 2750.6 | 2750.6 |
| 2.5°   | 2766.6 | 2753.4 | 2724.2 | 2750.6 | 2745.5 |
| 5°     | 2750.6 | 2740.3 | 2711.1 | 2732.1 | 2727.0 |
| 7.5°   | 2732.1 | 2716.3 | 2687.2 | 2708.6 | 2703.2 |
| 10°    | 2703.2 | 2684.6 | 2652.9 | 2674.0 | 2666.1 |
| 12.5°  | 2663.3 | 2647.7 | 2616.0 | 2629.1 | 2623.7 |
| 15°    | 2618.5 | 2602.7 | 2568.2 | 2578.9 | 2565.7 |
| 17.5°  | 2562.8 | 2547.2 | 2512.6 | 2525.9 | 2512.6 |
| 20°    | 2501.9 | 2486.3 | 2449.2 | 2457.1 | 2446.7 |
| 22.5°  | 2441.3 | 2417.5 | 2383.0 | 2383.0 | 2377.6 |
| 25°    | 2369.9 | 2348.7 | 2303.9 | 2309.0 | 2303.9 |
| 27.5°  | 2290.4 | 2271.9 | 2237.7 | 2229.8 | 2216.6 |
| 30°    | 2211.3 | 2189.9 | 2150.4 | 2142.5 | 2131.8 |
| 32.5°  | 2126.5 | 2110.8 | 2068.4 | 2052.5 | 2041.7 |
| 35°    | 2044.6 | 2018.2 | 1975.8 | 1959.8 | 1946.6 |
| 37.5°  | 1952.0 | 1928.1 | 1885.7 | 1867.2 | 1854.0 |
| 40°    | 1856.8 | 1835.5 | 1793.1 | 1769.6 | 1758.9 |
| 42.5°  | 1764.2 | 1742.9 | 1700.8 | 1674.2 | 1658.4 |
| 45°    | 1663.8 | 1645.3 | 1605.4 | 1576.5 | 1565.8 |
| 47.5°  | 1565.8 | 1547.3 | 1504.9 | 1475.7 | 1460.1 |
| 50°    | 1462.6 | 1449.4 | 1412.3 | 1375.3 | 1362.1 |
| 52.5°  | 1362.1 | 1343.6 | 1309.4 | 1280.2 | 1261.6 |
| 55°    | 1259.1 | 1243.1 | 1211.4 | 1179.7 | 1166.5 |
| 57.5°  | 1155.9 | 1142.7 | 1108.1 | 1076.4 | 1065.8 |
| 60°    | 1052.6 | 1042.2 | 1005.2 | 976.0  | 968.2  |
| 62.5°  | 952.1  | 933.6  | 907.3  | 880.9  | 870.2  |
| 65°    | 849.2  | 833.1  | 806.8  | 782.9  | 769.7  |
| 67.5°  | 743.4  | 729.9  | 706.3  | 687.8  | 677.1  |
| 70°    | 645.4  | 634.8  | 610.9  | 592.4  | 582.0  |
| 72.5°  | 544.9  | 534.3  | 521.1  | 502.6  | 494.7  |
| 75°    | 444.2  | 439.2  | 425.7  | 410.0  | 415.4  |
| 77.5°  | 354.5  | 343.8  | 338.4  | 330.5  | 322.8  |
| 80°    | 264.6  | 261.9  | 256.5  | 248.6  | 243.3  |
| 82.5°  | 179.9  | 179.9  | 177.3  | 166.7  | 166.7  |
| 85°    | 108.4  | 105.8  | 103.3  | 95.1   | 92.6   |
| 87.5°  | 47.7   | 42.4   | 37.1   | 29.2   | 26.4   |
| 90°    | 1.6    | 20.7   | 34.4   | 43.2   | 46.6   |
| 92.5°  | 43.2   | 36.3   | 41.4   | 44.9   | 46.6   |
| 95°    | 112.1  | 55.1   | 67.3   | 76.0   | 74.2   |
| 97.5°  | 201.9  | 60.5   | 88.0   | 93.3   | 94.9   |
| 100°   | 305.7  | 69.1   | 98.4   | 112.1  | 115.6  |
| 102.5° | 419.4  | 416.2  | 101.9  | 120.8  | 126.0  |
| 105°   | 524.8  | 576.6  | 105.3  | 124.2  | 131.2  |
| 107.5° | 647.3  | 690.4  | 108.9  | 127.7  | 134.7  |
| 110°   | 764.9  | 800.9  | 302.2  | 129.6  | 136.3  |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 875.4  | 906.3  | 877.0  | 132.8  | 138.1  |
| 115°   | 992.6  | 1021.9 | 1065.1 | 265.9  | 141.7  |
| 117.5° | 1094.5 | 1128.9 | 1158.4 | 911.4  | 459.2  |
| 120°   | 1208.4 | 1234.3 | 1265.5 | 1286.2 | 1053.1 |
| 122.5° | 1304.9 | 1332.6 | 1367.4 | 1377.6 | 1379.4 |
| 125°   | 1403.4 | 1425.9 | 1458.8 | 1470.9 | 1475.9 |
| 127.5° | 1493.2 | 1517.3 | 1543.4 | 1560.6 | 1562.3 |
| 130°   | 1577.8 | 1605.5 | 1624.4 | 1643.5 | 1641.8 |
| 132.5° | 1664.2 | 1686.7 | 1705.6 | 1721.1 | 1719.5 |
| 135°   | 1736.7 | 1764.3 | 1779.8 | 1797.2 | 1793.7 |
| 137.5° | 1812.5 | 1833.3 | 1850.7 | 1867.9 | 1862.8 |
| 140°   | 1886.7 | 1900.7 | 1919.6 | 1935.1 | 1926.5 |
| 142.5° | 1949.0 | 1961.2 | 1983.5 | 1997.2 | 1988.6 |
| 145°   | 2014.7 | 2012.9 | 2042.2 | 2054.3 | 2045.7 |
| 147.5° | 2071.4 | 2066.4 | 2095.7 | 2104.3 | 2097.5 |
| 150°   | 2126.8 | 2114.8 | 2142.4 | 2152.6 | 2144.0 |
| 152.5° | 2173.3 | 2159.6 | 2185.5 | 2195.9 | 2183.8 |
| 155°   | 2218.3 | 2202.8 | 2223.5 | 2233.8 | 2220.1 |
| 157.5° | 2254.5 | 2240.8 | 2256.3 | 2268.5 | 2254.5 |
| 160°   | 2285.7 | 2275.2 | 2285.7 | 2295.9 | 2283.8 |
| 162.5° | 2313.2 | 2302.9 | 2311.5 | 2323.6 | 2308.0 |
| 165°   | 2337.3 | 2327.1 | 2332.2 | 2344.3 | 2332.2 |
| 167.5° | 2356.4 | 2345.9 | 2351.3 | 2363.4 | 2347.8 |
| 170°   | 2372.0 | 2361.6 | 2365.0 | 2377.1 | 2361.6 |
| 172.5° | 2382.3 | 2372.0 | 2375.5 | 2387.5 | 2372.0 |
| 175°   | 2390.9 | 2378.7 | 2382.3 | 2394.3 | 2377.1 |
| 177.5° | 2394.3 | 2382.3 | 2384.1 | 2396.2 | 2380.6 |
| 180°   | 2385.7 | 2385.7 | 2385.7 | 2385.7 | 2385.7 |

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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 | 9.70             | 10.57 | 10.66 | 11.54 | 12.81 | 9.26           | 10.12 | 10.22 | 11.10 | 12.37 |
|                 | 3H   | 11.37            | 12.14 | 12.34 | 13.12 | 14.41 | 10.88          | 11.66 | 11.85 | 12.64 | 13.93 |
|                 | 4H   | 11.96            | 12.69 | 12.94 | 13.67 | 14.97 | 11.47          | 12.20 | 12.45 | 13.19 | 14.49 |
|                 | 6H   | 12.36            | 13.03 | 13.35 | 14.02 | 15.34 | 11.87          | 12.54 | 12.86 | 13.53 | 14.85 |
|                 | 8H   | 12.46            | 13.11 | 13.46 | 14.11 | 15.42 | 11.97          | 12.61 | 12.97 | 13.62 | 14.93 |
|                 | 12H  | 12.51            | 13.12 | 13.52 | 14.13 | 15.46 | 12.01          | 12.62 | 13.02 | 13.63 | 14.96 |
| 4H              | 2H   | 10.17            | 10.90 | 11.15 | 11.88 | 13.18 | 9.81           | 10.55 | 10.80 | 11.53 | 12.83 |
|                 | 3H   | 12.03            | 12.65 | 13.03 | 13.66 | 14.98 | 11.63          | 12.24 | 12.63 | 13.26 | 14.57 |
|                 | 4H   | 12.75            | 13.31 | 13.76 | 14.32 | 15.66 | 12.33          | 12.89 | 13.34 | 13.90 | 15.24 |
|                 | 6H   | 13.27            | 13.75 | 14.29 | 14.78 | 16.12 | 12.84          | 13.33 | 13.86 | 14.36 | 15.69 |
|                 | 8H   | 13.42            | 13.87 | 14.44 | 14.89 | 16.24 | 12.99          | 13.44 | 14.01 | 14.46 | 15.82 |
|                 | 12H  | 13.50            | 13.90 | 14.53 | 14.94 | 16.30 | 13.05          | 13.46 | 14.09 | 14.50 | 15.86 |
| 8H              | 4H   | 12.95            | 13.40 | 13.97 | 14.42 | 15.77 | 12.58          | 13.03 | 13.59 | 14.05 | 15.40 |
|                 | 6H   | 13.58            | 13.95 | 14.63 | 15.02 | 16.37 | 13.21          | 13.58 | 14.25 | 14.64 | 15.99 |
|                 | 8H   | 13.81            | 14.13 | 14.86 | 15.18 | 16.55 | 13.42          | 13.75 | 14.47 | 14.80 | 16.17 |
|                 | 12H  | 13.94            | 14.23 | 14.99 | 15.27 | 16.68 | 13.54          | 13.82 | 14.59 | 14.87 | 16.28 |
| 12H             | 4H   | 12.93            | 13.34 | 13.97 | 14.38 | 15.74 | 12.57          | 12.98 | 13.61 | 14.02 | 15.37 |
|                 | 6H   | 13.61            | 13.94 | 14.66 | 14.99 | 16.36 | 13.25          | 13.58 | 14.30 | 14.63 | 15.99 |
|                 | 8H   | 13.86            | 14.15 | 14.91 | 15.19 | 16.60 | 13.48          | 13.77 | 14.54 | 14.82 | 16.23 |