

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: P912591

Luminaire Tested: DFN2DIP-TR3F0-040D080US850-FLLONL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P912591  
REPORT IS A COMBINATION OF REPORTS P901863 AND P898751  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-TR3F0-040D080US850-FLLONL  
Description: 3 foot, Triangle Define Geo, with Direct Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

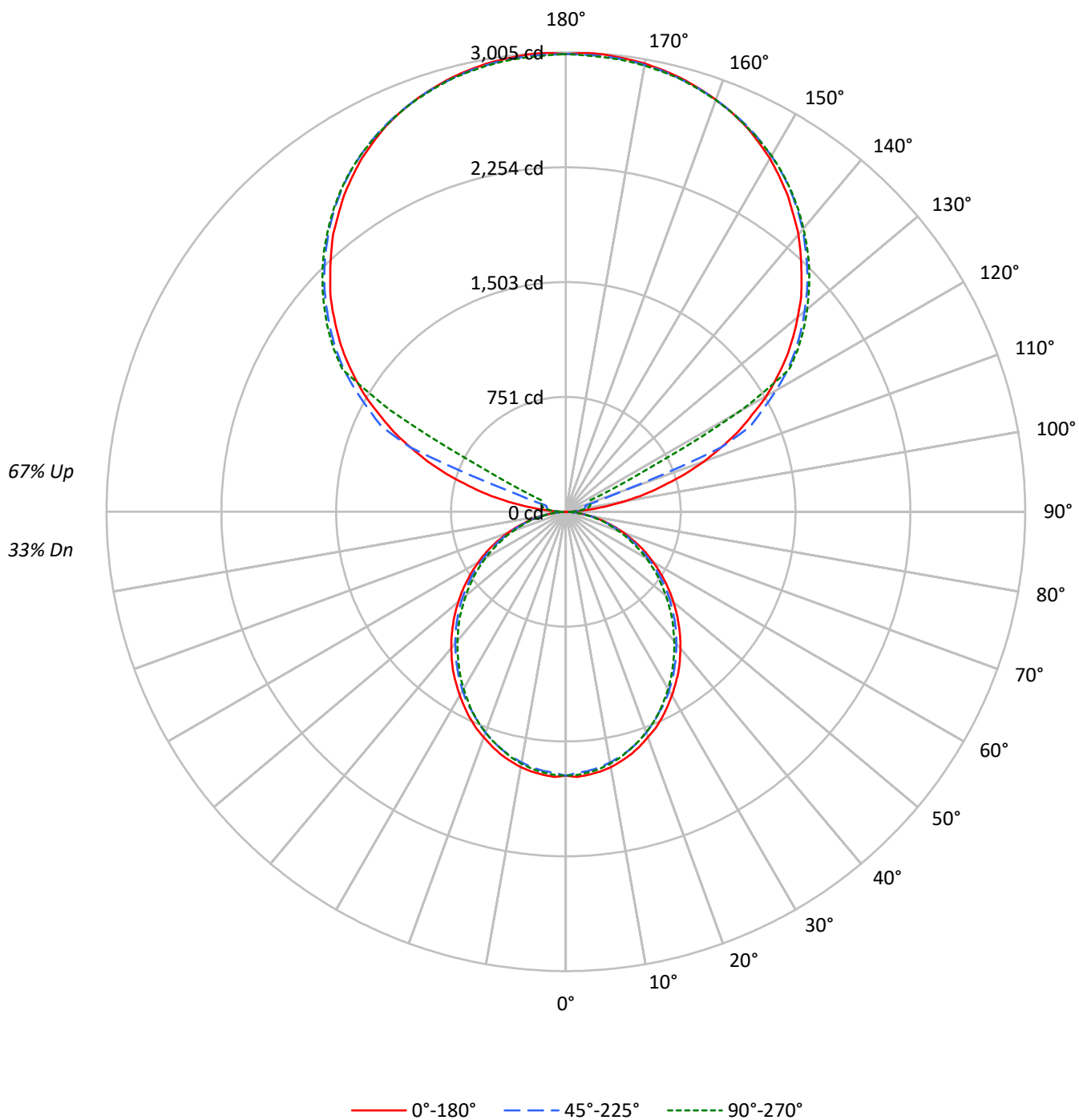
Lumens per Lamp: N/A  
Luminaire Lumens: 13175.0 lumens  
Efficiency: N/A  
Efficacy: 137.1 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 2.74' x L: 3.16' x H: 0.1')  
CIE Type: Semi-Indirect

Input Watts (W): 96.1  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9951  
Total Harmonic Distortion (THDi): 0.07  
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   | 103 | 103 | 103 | 103 | 93 | 93 | 93 | 93 | 74 | 74 | 74 | 57 | 57 | 57 | 41 | 41 | 41 |
| 1   | 94  | 90  | 86  | 83  | 85 | 81 | 78 | 75 | 65 | 63 | 61 | 50 | 48 | 47 | 36 | 35 | 34 |
| 2   | 86  | 78  | 72  | 67  | 77 | 71 | 66 | 62 | 57 | 53 | 50 | 44 | 41 | 39 | 32 | 30 | 29 |
| 3   | 78  | 69  | 62  | 56  | 70 | 62 | 56 | 51 | 50 | 46 | 42 | 39 | 36 | 33 | 28 | 26 | 25 |
| 4   | 71  | 61  | 53  | 47  | 64 | 55 | 49 | 43 | 44 | 40 | 36 | 34 | 31 | 28 | 25 | 23 | 21 |
| 5   | 65  | 54  | 46  | 40  | 59 | 49 | 42 | 37 | 40 | 35 | 31 | 31 | 27 | 25 | 23 | 20 | 18 |
| 6   | 60  | 48  | 41  | 35  | 54 | 44 | 37 | 32 | 36 | 31 | 27 | 28 | 24 | 21 | 20 | 18 | 16 |
| 7   | 56  | 44  | 36  | 30  | 50 | 40 | 33 | 28 | 32 | 27 | 23 | 25 | 22 | 19 | 19 | 16 | 14 |
| 8   | 51  | 39  | 32  | 27  | 46 | 36 | 29 | 25 | 29 | 24 | 21 | 23 | 19 | 17 | 17 | 15 | 13 |
| 9   | 48  | 36  | 29  | 24  | 43 | 33 | 26 | 22 | 27 | 22 | 19 | 21 | 18 | 15 | 16 | 13 | 12 |
| 10  | 45  | 33  | 26  | 21  | 40 | 30 | 24 | 20 | 25 | 20 | 17 | 19 | 16 | 14 | 15 | 12 | 11 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 2151 | 2151 | 2151 |
| 5°  | 2153 | 2119 | 2134 |
| 10° | 2134 | 2089 | 2103 |
| 15° | 2102 | 2053 | 2057 |
| 20° | 2058 | 2003 | 2009 |
| 25° | 2015 | 1944 | 1954 |
| 30° | 1961 | 1889 | 1885 |
| 35° | 1909 | 1825 | 1812 |
| 40° | 1846 | 1759 | 1742 |
| 45° | 1783 | 1694 | 1671 |
| 50° | 1715 | 1625 | 1588 |
| 55° | 1642 | 1545 | 1512 |
| 60° | 1561 | 1451 | 1424 |
| 65° | 1471 | 1353 | 1321 |
| 70° | 1357 | 1233 | 1209 |
| 75° | 1200 | 1090 | 1104 |
| 80° | 1010 | 907  | 908  |
| 85° | 714  | 597  | 586  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 90°

Vertical Angle: 90°

Luminance: 1990 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 162.5   | 1.2       |
| 10°-20°   | 457.1   | 3.5       |
| 20°-30°   | 671.7   | 5.1       |
| 30°-40°   | 780.2   | 5.9       |
| 40°-50°   | 779.2   | 5.9       |
| 50°-60°   | 679.5   | 5.2       |
| 60°-70°   | 502.3   | 3.8       |
| 70°-80°   | 284.2   | 2.2       |
| 80°-90°   | 80.3    | 0.6       |
| 90°-100°  | 98.7    | 0.7       |
| 100°-110° | 368.1   | 2.8       |
| 110°-120° | 976.2   | 7.4       |
| 120°-130° | 1619.0  | 12.3      |
| 130°-140° | 1719.8  | 13.1      |
| 140°-150° | 1598.3  | 12.1      |
| 150°-160° | 1285.0  | 9.8       |
| 160°-170° | 828.0   | 6.3       |
| 170°-180° | 285.0   | 2.2       |
| 0°-30°    | 1291.3  | 9.8       |
| 0°-40°    | 2071.5  | 15.7      |
| 0°-60°    | 3530.2  | 26.8      |
| 0°-90°    | 4396.9  | 33.4      |
| 90°-120°  | 1442.9  | 11.0      |
| 90°-150°  | 6380.0  | 48.4      |
| 90°-180°  | 8778.0  | 66.6      |
| 0°-180°   | 13175.0 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 1726 | 1726  | 1726 | 1726  | 1726 |      |
| 5°   | 1726 | 1720  | 1701 | 1714  | 1711 | 164  |
| 15°  | 1643 | 1633  | 1612 | 1618  | 1610 | 463  |
| 25°  | 1487 | 1474  | 1446 | 1449  | 1446 | 684  |
| 35°  | 1283 | 1266  | 1240 | 1230  | 1222 | 801  |
| 45°  | 1044 | 1032  | 1007 | 989   | 983  | 806  |
| 55°  | 790  | 780   | 760  | 740   | 732  | 706  |
| 65°  | 533  | 523   | 506  | 491   | 483  | 527  |
| 75°  | 279  | 276   | 267  | 257   | 261  | 298  |
| 85°  | 68   | 66    | 65   | 60    | 58   | 76   |
| 90°  | 2    | 26    | 43   | 54    | 58   | 12   |
| 95°  | 141  | 69    | 84   | 96    | 93   | 167  |
| 105° | 659  | 724   | 132  | 156   | 165  | 704  |
| 115° | 1246 | 1283  | 1337 | 334   | 178  | 1226 |
| 125° | 1761 | 1790  | 1831 | 1846  | 1852 | 1571 |
| 135° | 2180 | 2214  | 2234 | 2256  | 2251 | 1684 |
| 145° | 2528 | 2526  | 2563 | 2578  | 2567 | 1581 |
| 155° | 2784 | 2765  | 2791 | 2804  | 2786 | 1283 |
| 165° | 2934 | 2921  | 2927 | 2942  | 2927 | 829  |
| 175° | 3001 | 2985  | 2990 | 3005  | 2983 | 286  |
| 180° | 2994 | 2994  | 2994 | 2994  | 2994 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 1726.0 | 1726.0 | 1726.0 | 1726.0 | 1726.0 |
| 2.5°   | 1736.1 | 1727.8 | 1709.5 | 1726.0 | 1722.9 |
| 5°     | 1726.0 | 1719.5 | 1701.2 | 1714.4 | 1711.3 |
| 7.5°   | 1714.4 | 1704.5 | 1686.2 | 1699.7 | 1696.3 |
| 10°    | 1696.3 | 1684.7 | 1664.8 | 1678.0 | 1673.0 |
| 12.5°  | 1671.3 | 1661.4 | 1641.5 | 1649.9 | 1646.4 |
| 15°    | 1643.1 | 1633.2 | 1611.6 | 1618.3 | 1610.0 |
| 17.5°  | 1608.3 | 1598.4 | 1576.8 | 1585.0 | 1576.8 |
| 20°    | 1570.0 | 1560.1 | 1537.0 | 1541.8 | 1535.4 |
| 22.5°  | 1532.0 | 1517.0 | 1495.4 | 1495.4 | 1492.0 |
| 25°    | 1487.1 | 1473.9 | 1445.7 | 1448.9 | 1445.7 |
| 27.5°  | 1437.3 | 1425.6 | 1404.2 | 1399.2 | 1391.0 |
| 30°    | 1387.6 | 1374.3 | 1349.4 | 1344.4 | 1337.8 |
| 32.5°  | 1334.5 | 1324.6 | 1298.0 | 1288.0 | 1281.2 |
| 35°    | 1283.0 | 1266.5 | 1239.9 | 1229.9 | 1221.6 |
| 37.5°  | 1224.9 | 1209.9 | 1183.3 | 1171.8 | 1163.5 |
| 40°    | 1165.2 | 1151.8 | 1125.2 | 1110.4 | 1103.8 |
| 42.5°  | 1107.1 | 1093.7 | 1067.3 | 1050.6 | 1040.7 |
| 45°    | 1044.0 | 1032.5 | 1007.4 | 989.3  | 982.6  |
| 47.5°  | 982.6  | 970.9  | 944.4  | 926.1  | 916.3  |
| 50°    | 917.8  | 909.5  | 886.3  | 863.0  | 854.7  |
| 52.5°  | 854.7  | 843.2  | 821.7  | 803.4  | 791.7  |
| 55°    | 790.2  | 780.1  | 760.2  | 740.3  | 732.1  |
| 57.5°  | 725.3  | 717.1  | 695.3  | 675.5  | 668.8  |
| 60°    | 660.5  | 654.0  | 630.8  | 612.5  | 607.5  |
| 62.5°  | 597.5  | 585.9  | 569.4  | 552.7  | 546.1  |
| 65°    | 532.9  | 522.8  | 506.3  | 491.3  | 483.1  |
| 67.5°  | 466.4  | 458.0  | 443.3  | 431.6  | 425.0  |
| 70°    | 405.0  | 398.4  | 383.4  | 371.7  | 365.2  |
| 72.5°  | 342.0  | 335.3  | 327.0  | 315.4  | 310.4  |
| 75°    | 278.8  | 275.6  | 267.2  | 257.3  | 260.6  |
| 77.5°  | 222.4  | 215.7  | 212.4  | 207.4  | 202.5  |
| 80°    | 166.0  | 164.2  | 160.9  | 156.0  | 152.7  |
| 82.5°  | 112.9  | 112.9  | 111.3  | 104.6  | 104.6  |
| 85°    | 68.0   | 66.4   | 64.8   | 59.7   | 58.1   |
| 87.5°  | 29.9   | 26.6   | 23.3   | 18.3   | 16.5   |
| 90°    | 2.1    | 26.0   | 43.3   | 54.2   | 58.4   |
| 92.5°  | 54.2   | 45.6   | 52.0   | 56.3   | 58.4   |
| 95°    | 140.7  | 69.2   | 84.4   | 95.5   | 93.2   |
| 97.5°  | 253.4  | 75.9   | 110.3  | 117.1  | 119.1  |
| 100°   | 383.6  | 86.7   | 123.5  | 140.7  | 145.1  |
| 102.5° | 526.4  | 522.2  | 127.9  | 151.5  | 158.3  |
| 105°   | 658.6  | 723.7  | 132.2  | 155.9  | 164.7  |
| 107.5° | 812.5  | 866.5  | 136.6  | 160.3  | 169.0  |
| 110°   | 960.0  | 1005.2 | 379.3  | 162.6  | 171.1  |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 1098.6 | 1137.4 | 1100.7 | 166.7  | 173.4  |
| 115°   | 1245.7 | 1282.6 | 1336.8 | 333.7  | 177.8  |
| 117.5° | 1373.6 | 1416.9 | 1453.9 | 1143.8 | 576.3  |
| 120°   | 1516.7 | 1549.1 | 1588.2 | 1614.1 | 1321.6 |
| 122.5° | 1637.8 | 1672.6 | 1716.1 | 1728.9 | 1731.3 |
| 125°   | 1761.3 | 1789.6 | 1830.7 | 1845.9 | 1852.4 |
| 127.5° | 1874.0 | 1904.4 | 1937.1 | 1958.6 | 1960.7 |
| 130°   | 1980.2 | 2014.9 | 2038.7 | 2062.6 | 2060.5 |
| 132.5° | 2088.6 | 2116.9 | 2140.6 | 2160.1 | 2158.0 |
| 135°   | 2179.6 | 2214.3 | 2233.6 | 2255.6 | 2251.2 |
| 137.5° | 2274.9 | 2300.8 | 2322.7 | 2344.3 | 2337.9 |
| 140°   | 2367.9 | 2385.5 | 2409.2 | 2428.7 | 2417.8 |
| 142.5° | 2446.2 | 2461.3 | 2489.4 | 2506.7 | 2495.8 |
| 145°   | 2528.5 | 2526.2 | 2563.0 | 2578.2 | 2567.3 |
| 147.5° | 2599.8 | 2593.4 | 2630.1 | 2641.0 | 2632.4 |
| 150°   | 2669.3 | 2654.1 | 2688.8 | 2701.6 | 2690.9 |
| 152.5° | 2727.7 | 2710.4 | 2742.8 | 2756.0 | 2740.8 |
| 155°   | 2784.0 | 2764.7 | 2790.7 | 2803.6 | 2786.4 |
| 157.5° | 2829.5 | 2812.3 | 2831.8 | 2847.0 | 2829.5 |
| 160°   | 2868.7 | 2855.6 | 2868.7 | 2881.5 | 2866.3 |
| 162.5° | 2903.1 | 2890.3 | 2901.0 | 2916.2 | 2896.7 |
| 165°   | 2933.5 | 2920.7 | 2927.1 | 2942.2 | 2927.1 |
| 167.5° | 2957.4 | 2944.3 | 2950.9 | 2966.1 | 2946.6 |
| 170°   | 2977.0 | 2963.8 | 2968.2 | 2983.4 | 2963.8 |
| 172.5° | 2989.9 | 2977.0 | 2981.3 | 2996.5 | 2977.0 |
| 175°   | 3000.6 | 2985.4 | 2989.9 | 3004.9 | 2983.4 |
| 177.5° | 3004.9 | 2989.9 | 2992.1 | 3007.3 | 2987.8 |
| 180°   | 2994.2 | 2994.2 | 2994.2 | 2994.2 | 2994.2 |

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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 | 8.11             | 8.84  | 9.20  | 9.92  | 11.42 | 7.68           | 8.41  | 8.77  | 9.50  | 10.99 |
|                 | 3H   | 9.75             | 10.40 | 10.85 | 11.50 | 13.01 | 9.28           | 9.93  | 10.38 | 11.03 | 12.54 |
|                 | 4H   | 10.32            | 10.94 | 11.43 | 12.04 | 13.55 | 9.86           | 10.48 | 10.96 | 11.57 | 13.09 |
|                 | 6H   | 10.71            | 11.28 | 11.83 | 12.38 | 13.91 | 10.24          | 10.81 | 11.36 | 11.91 | 13.44 |
|                 | 8H   | 10.81            | 11.35 | 11.93 | 12.47 | 13.98 | 10.34          | 10.88 | 11.46 | 12.00 | 13.52 |
|                 | 12H  | 10.85            | 11.36 | 11.97 | 12.47 | 14.01 | 10.37          | 10.89 | 11.50 | 12.00 | 13.54 |
| 4H              | 2H   | 8.55             | 9.17  | 9.66  | 10.27 | 11.78 | 8.21           | 8.83  | 9.32  | 9.92  | 11.44 |
|                 | 3H   | 10.39            | 10.91 | 11.51 | 12.03 | 13.56 | 10.00          | 10.52 | 11.12 | 11.64 | 13.17 |
|                 | 4H   | 11.09            | 11.57 | 12.22 | 12.68 | 14.23 | 10.69          | 11.17 | 11.82 | 12.28 | 13.83 |
|                 | 6H   | 11.59            | 12.00 | 12.73 | 13.14 | 14.67 | 11.19          | 11.60 | 12.32 | 12.73 | 14.27 |
|                 | 8H   | 11.74            | 12.12 | 12.87 | 13.24 | 14.80 | 11.33          | 11.71 | 12.46 | 12.84 | 14.39 |
|                 | 12H  | 11.80            | 12.14 | 12.95 | 13.28 | 14.84 | 11.38          | 11.73 | 12.53 | 12.87 | 14.43 |
| 8H              | 4H   | 11.28            | 11.66 | 12.41 | 12.78 | 14.34 | 10.92          | 11.30 | 12.05 | 12.43 | 13.98 |
|                 | 6H   | 11.89            | 12.21 | 13.04 | 13.38 | 14.93 | 11.53          | 11.85 | 12.69 | 13.02 | 14.57 |
|                 | 8H   | 12.10            | 12.38 | 13.26 | 13.53 | 15.10 | 11.74          | 12.02 | 12.90 | 13.16 | 14.74 |
|                 | 12H  | 12.22            | 12.46 | 13.39 | 13.61 | 15.22 | 11.85          | 12.09 | 13.01 | 13.23 | 14.84 |
| 12H             | 4H   | 11.26            | 11.60 | 12.40 | 12.74 | 14.30 | 10.91          | 11.25 | 12.05 | 12.39 | 13.95 |
|                 | 6H   | 11.92            | 12.19 | 13.08 | 13.34 | 14.91 | 11.57          | 11.85 | 12.73 | 12.99 | 14.57 |
|                 | 8H   | 12.15            | 12.39 | 13.31 | 13.53 | 15.14 | 11.79          | 12.04 | 12.96 | 13.18 | 14.79 |