

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: P915448

Luminaire Tested: DFN2DIP-TR3F0-090D080US927-FLLFLL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P915448  
REPORT IS A COMBINATION OF REPORTS P900353 AND P897195  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-TR3F0-090D080US927-FLLFLL  
Description: 3 foot, Triangle Define Geo, with Direct Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

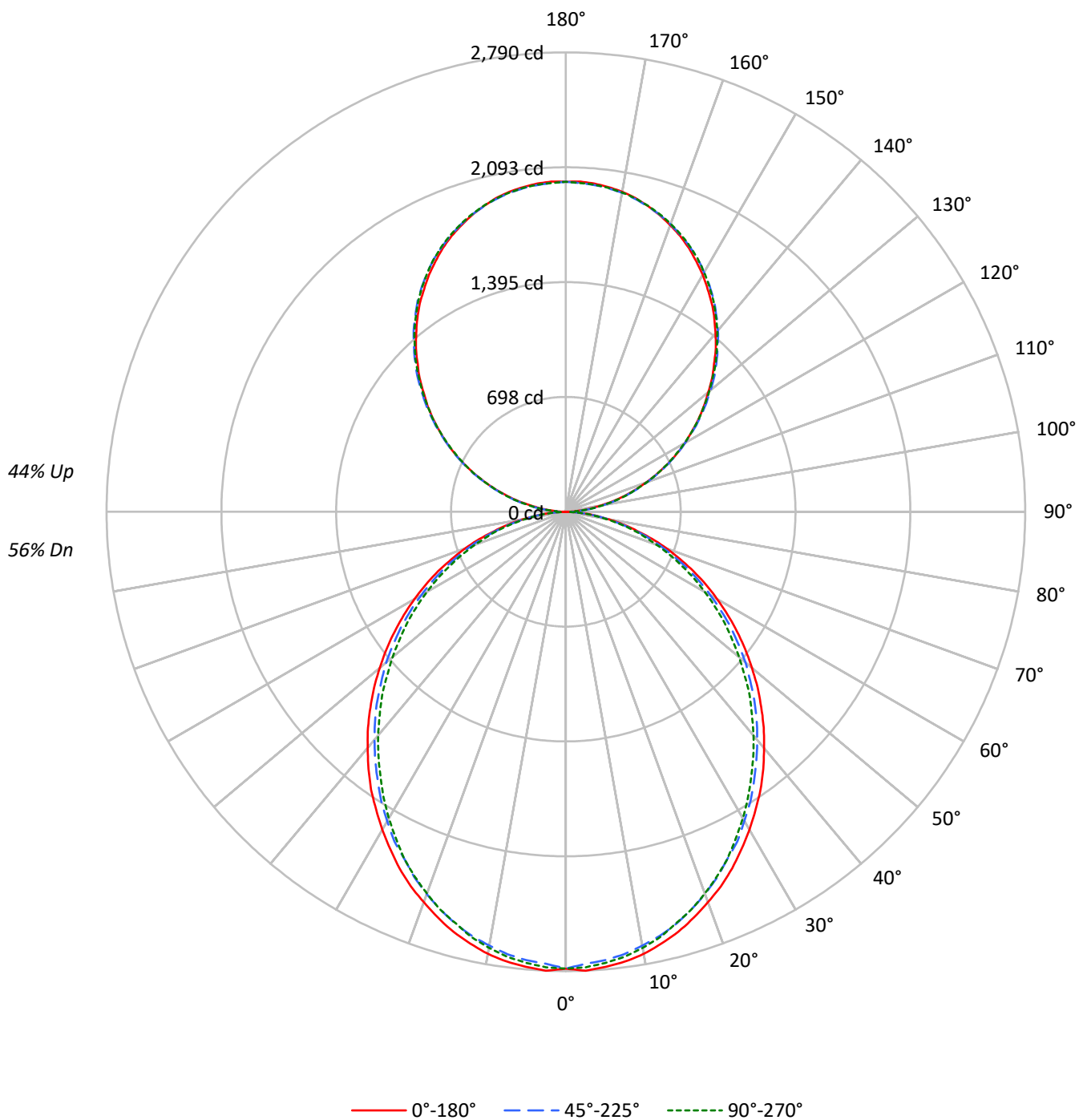
Lumens per Lamp: N/A  
Luminaire Lumens: 12667.0 lumens  
Efficiency: N/A  
Efficacy: 81.2 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 2.74' x L: 3.16' x H: 0.1')  
CIE Type: General Diffuse

Input Watts (W): 156  
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   | 109 | 109 | 109 | 109 | 101 | 101 | 101 | 101 | 87 | 87 | 87 | 73 | 73 | 73 | 61 | 61 | 61 |
| 1   | 99  | 95  | 91  | 87  | 92  | 88  | 85  | 82  | 76 | 73 | 71 | 65 | 63 | 61 | 54 | 53 | 52 |
| 2   | 90  | 83  | 77  | 71  | 84  | 77  | 72  | 67  | 67 | 62 | 59 | 57 | 54 | 51 | 48 | 46 | 44 |
| 3   | 82  | 73  | 65  | 59  | 76  | 68  | 61  | 56  | 59 | 54 | 50 | 50 | 46 | 43 | 42 | 40 | 37 |
| 4   | 75  | 64  | 56  | 50  | 70  | 60  | 53  | 48  | 52 | 47 | 42 | 45 | 41 | 37 | 38 | 35 | 32 |
| 5   | 69  | 57  | 49  | 43  | 64  | 54  | 46  | 41  | 47 | 41 | 36 | 40 | 36 | 32 | 34 | 31 | 28 |
| 6   | 64  | 52  | 43  | 37  | 59  | 48  | 41  | 36  | 42 | 36 | 32 | 36 | 32 | 28 | 31 | 27 | 25 |
| 7   | 59  | 47  | 39  | 33  | 55  | 44  | 36  | 31  | 38 | 32 | 28 | 33 | 28 | 25 | 28 | 25 | 22 |
| 8   | 55  | 42  | 35  | 29  | 51  | 40  | 33  | 28  | 35 | 29 | 25 | 30 | 26 | 22 | 26 | 22 | 20 |
| 9   | 51  | 39  | 31  | 26  | 47  | 36  | 30  | 25  | 32 | 26 | 22 | 28 | 23 | 20 | 24 | 20 | 18 |
| 10  | 48  | 36  | 28  | 23  | 44  | 33  | 27  | 22  | 30 | 24 | 20 | 26 | 21 | 18 | 22 | 19 | 16 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 3457 | 3457 | 3457 |
| 5°  | 3460 | 3406 | 3429 |
| 10° | 3431 | 3357 | 3381 |
| 15° | 3378 | 3299 | 3306 |
| 20° | 3308 | 3219 | 3229 |
| 25° | 3238 | 3124 | 3141 |
| 30° | 3151 | 3036 | 3030 |
| 35° | 3069 | 2932 | 2912 |
| 40° | 2967 | 2827 | 2800 |
| 45° | 2866 | 2722 | 2685 |
| 50° | 2756 | 2611 | 2552 |
| 55° | 2640 | 2483 | 2429 |
| 60° | 2508 | 2332 | 2288 |
| 65° | 2365 | 2174 | 2123 |
| 70° | 2182 | 1982 | 1943 |
| 75° | 1929 | 1752 | 1775 |
| 80° | 1624 | 1457 | 1459 |
| 85° | 1146 | 960  | 942  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 2866 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 261.1   | 2.1       |
| 10°-20°   | 734.7   | 5.8       |
| 20°-30°   | 1079.6  | 8.5       |
| 30°-40°   | 1253.9  | 9.9       |
| 40°-50°   | 1252.4  | 9.9       |
| 50°-60°   | 1092.1  | 8.6       |
| 60°-70°   | 807.3   | 6.4       |
| 70°-80°   | 456.7   | 3.6       |
| 80°-90°   | 126.2   | 1.0       |
| 90°-100°  | 124.0   | 1.0       |
| 100°-110° | 394.1   | 3.1       |
| 110°-120° | 674.4   | 5.3       |
| 120°-130° | 886.9   | 7.0       |
| 130°-140° | 995.5   | 7.9       |
| 140°-150° | 976.2   | 7.7       |
| 150°-160° | 818.9   | 6.5       |
| 160°-170° | 543.1   | 4.3       |
| 170°-180° | 189.8   | 1.5       |
| 0°-30°    | 2075.4  | 16.4      |
| 0°-40°    | 3329.4  | 26.3      |
| 0°-60°    | 5673.8  | 44.8      |
| 0°-90°    | 7064.0  | 55.8      |
| 90°-120°  | 1192.5  | 9.4       |
| 90°-150°  | 4051.1  | 32.0      |
| 90°-180°  | 5603.0  | 44.2      |
| 0°-180°   | 12667.0 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 2774 | 2774  | 2774 | 2774  | 2774 |      |
| 5°   | 2774 | 2764  | 2734 | 2756  | 2750 | 263  |
| 15°  | 2641 | 2625  | 2590 | 2601  | 2588 | 744  |
| 25°  | 2390 | 2369  | 2324 | 2329  | 2324 | 1100 |
| 35°  | 2062 | 2036  | 1993 | 1977  | 1963 | 1288 |
| 45°  | 1678 | 1659  | 1619 | 1590  | 1579 | 1295 |
| 55°  | 1270 | 1254  | 1222 | 1190  | 1176 | 1135 |
| 65°  | 856  | 840   | 814  | 790   | 776  | 847  |
| 75°  | 448  | 443   | 429  | 414   | 419  | 478  |
| 85°  | 109  | 107   | 104  | 96    | 93   | 122  |
| 90°  | 2    | 22    | 59   | 56    | 57   | 12   |
| 95°  | 88   | 105   | 108  | 108   | 105  | 98   |
| 105° | 364  | 369   | 372  | 375   | 375  | 384  |
| 115° | 677  | 686   | 683  | 682   | 677  | 669  |
| 125° | 984  | 999   | 995  | 989   | 987  | 880  |
| 135° | 1273 | 1292  | 1296 | 1294  | 1289 | 984  |
| 145° | 1546 | 1558  | 1567 | 1569  | 1563 | 966  |
| 155° | 1767 | 1772  | 1778 | 1786  | 1781 | 813  |
| 165° | 1923 | 1921  | 1921 | 1933  | 1924 | 542  |
| 175° | 2001 | 1996  | 1992 | 2004  | 1994 | 190  |
| 180° | 2004 | 2004  | 2004 | 2004  | 2004 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 2774.1 | 2774.1 | 2774.1 | 2774.1 | 2774.1 |
| 2.5°   | 2790.3 | 2777.0 | 2747.6 | 2774.1 | 2769.1 |
| 5°     | 2774.1 | 2763.7 | 2734.3 | 2755.5 | 2750.4 |
| 7.5°   | 2755.5 | 2739.7 | 2710.2 | 2731.8 | 2726.4 |
| 10°    | 2726.4 | 2707.7 | 2675.7 | 2696.9 | 2689.0 |
| 12.5°  | 2686.1 | 2670.3 | 2638.4 | 2651.6 | 2646.3 |
| 15°    | 2640.9 | 2625.1 | 2590.2 | 2601.0 | 2587.7 |
| 17.5°  | 2584.8 | 2569.0 | 2534.2 | 2547.5 | 2534.2 |
| 20°    | 2523.4 | 2507.6 | 2470.2 | 2478.1 | 2467.6 |
| 22.5°  | 2462.3 | 2438.3 | 2403.4 | 2403.4 | 2398.0 |
| 25°    | 2390.1 | 2368.9 | 2323.6 | 2328.7 | 2323.6 |
| 27.5°  | 2310.0 | 2291.3 | 2256.8 | 2248.9 | 2235.6 |
| 30°    | 2230.2 | 2208.7 | 2168.8 | 2160.8 | 2150.1 |
| 32.5°  | 2144.8 | 2128.9 | 2086.1 | 2070.0 | 2059.3 |
| 35°    | 2062.1 | 2035.5 | 1992.7 | 1976.7 | 1963.3 |
| 37.5°  | 1968.7 | 1944.6 | 1901.9 | 1883.3 | 1869.9 |
| 40°    | 1872.7 | 1851.2 | 1808.5 | 1784.7 | 1774.0 |
| 42.5°  | 1779.3 | 1757.8 | 1715.4 | 1688.5 | 1672.7 |
| 45°    | 1678.0 | 1659.4 | 1619.1 | 1590.0 | 1579.3 |
| 47.5°  | 1579.3 | 1560.6 | 1517.8 | 1488.4 | 1472.6 |
| 50°    | 1475.1 | 1461.8 | 1424.4 | 1387.1 | 1373.8 |
| 52.5°  | 1373.8 | 1355.1 | 1320.6 | 1291.2 | 1272.5 |
| 55°    | 1269.9 | 1253.8 | 1221.8 | 1189.9 | 1176.5 |
| 57.5°  | 1165.8 | 1152.5 | 1117.7 | 1085.7 | 1074.9 |
| 60°    | 1061.6 | 1051.1 | 1013.8 | 984.4  | 976.4  |
| 62.5°  | 960.3  | 941.6  | 915.0  | 888.4  | 877.7  |
| 65°    | 856.4  | 840.3  | 813.6  | 789.6  | 776.3  |
| 67.5°  | 749.7  | 736.2  | 712.3  | 693.7  | 682.9  |
| 70°    | 650.9  | 640.2  | 616.2  | 597.5  | 587.0  |
| 72.5°  | 549.6  | 538.8  | 525.5  | 506.9  | 499.0  |
| 75°    | 448.1  | 442.9  | 429.4  | 413.5  | 418.9  |
| 77.5°  | 357.4  | 346.7  | 341.4  | 333.4  | 325.5  |
| 80°    | 266.9  | 264.0  | 258.6  | 250.7  | 245.4  |
| 82.5°  | 181.4  | 181.4  | 178.9  | 168.1  | 168.1  |
| 85°    | 109.2  | 106.7  | 104.2  | 95.9   | 93.4   |
| 87.5°  | 48.1   | 42.7   | 37.4   | 29.5   | 26.6   |
| 90°    | 1.8    | 21.8   | 59.3   | 55.6   | 57.4   |
| 92.5°  | 37.5   | 50.8   | 52.6   | 54.3   | 54.3   |
| 95°    | 88.2   | 105.1  | 108.1  | 108.1  | 105.1  |
| 97.5°  | 146.9  | 162.6  | 169.2  | 169.2  | 169.2  |
| 100°   | 214.5  | 228.4  | 233.2  | 233.2  | 231.4  |
| 102.5° | 285.8  | 296.1  | 302.7  | 304.5  | 302.7  |
| 105°   | 363.8  | 368.6  | 372.2  | 375.3  | 375.3  |
| 107.5° | 441.1  | 448.4  | 448.4  | 449.6  | 441.1  |
| 110°   | 516.0  | 525.7  | 525.7  | 525.7  | 520.9  |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 597.0  | 607.3  | 605.5  | 600.6  | 597.0  |
| 115°   | 676.8  | 686.4  | 683.4  | 681.6  | 676.8  |
| 117.5° | 755.9  | 769.2  | 760.7  | 755.9  | 751.1  |
| 120°   | 835.7  | 849.0  | 835.7  | 835.7  | 830.2  |
| 122.5° | 908.2  | 925.1  | 916.6  | 911.8  | 908.2  |
| 125°   | 984.3  | 999.4  | 994.6  | 989.1  | 987.4  |
| 127.5° | 1058.7 | 1077.4 | 1070.7 | 1063.5 | 1058.7 |
| 130°   | 1128.1 | 1149.9 | 1146.8 | 1143.3 | 1136.6 |
| 132.5° | 1206.1 | 1223.0 | 1224.2 | 1215.8 | 1210.9 |
| 135°   | 1273.1 | 1291.9 | 1295.5 | 1293.7 | 1288.9 |
| 137.5° | 1348.1 | 1363.2 | 1366.2 | 1365.0 | 1357.7 |
| 140°   | 1414.0 | 1429.0 | 1437.5 | 1437.5 | 1430.8 |
| 142.5° | 1481.6 | 1496.7 | 1501.6 | 1503.4 | 1496.7 |
| 145°   | 1545.7 | 1557.7 | 1567.4 | 1569.2 | 1562.6 |
| 147.5° | 1603.1 | 1618.2 | 1625.4 | 1628.5 | 1621.8 |
| 150°   | 1662.3 | 1672.5 | 1679.2 | 1684.7 | 1679.2 |
| 152.5° | 1714.8 | 1725.1 | 1733.6 | 1740.3 | 1733.6 |
| 155°   | 1767.4 | 1772.3 | 1777.7 | 1786.1 | 1780.7 |
| 157.5° | 1812.7 | 1816.4 | 1819.4 | 1831.4 | 1823.0 |
| 160°   | 1853.2 | 1856.9 | 1858.7 | 1868.9 | 1861.7 |
| 162.5° | 1890.7 | 1890.7 | 1892.5 | 1904.0 | 1895.5 |
| 165°   | 1922.7 | 1920.9 | 1920.9 | 1933.0 | 1924.5 |
| 167.5° | 1951.7 | 1946.3 | 1946.3 | 1958.4 | 1949.9 |
| 170°   | 1973.5 | 1968.6 | 1966.8 | 1978.9 | 1968.6 |
| 172.5° | 1988.6 | 1983.8 | 1982.0 | 1994.0 | 1983.8 |
| 175°   | 2000.7 | 1995.8 | 1992.2 | 2004.3 | 1994.0 |
| 177.5° | 2007.3 | 2002.5 | 1998.8 | 2009.1 | 1998.8 |
| 180°   | 2004.3 | 2004.3 | 2004.3 | 2004.3 | 2004.3 |

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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 | 12.05            | 12.96 | 12.95 | 13.89 | 15.07 | 11.62          | 12.53 | 12.52 | 13.46 | 14.64 |
|                 | 3H   | 13.70            | 14.52 | 14.62 | 15.46 | 16.67 | 13.23          | 14.05 | 14.15 | 14.99 | 16.20 |
|                 | 4H   | 14.28            | 15.06 | 15.22 | 16.00 | 17.22 | 13.82          | 14.59 | 14.75 | 15.53 | 16.75 |
|                 | 6H   | 14.68            | 15.40 | 15.62 | 16.34 | 17.57 | 14.21          | 14.93 | 15.15 | 15.87 | 17.11 |
|                 | 8H   | 14.78            | 15.46 | 15.73 | 16.43 | 17.66 | 14.31          | 15.00 | 15.27 | 15.96 | 17.19 |
|                 | 12H  | 14.83            | 15.48 | 15.79 | 16.43 | 17.69 | 14.36          | 15.00 | 15.31 | 15.96 | 17.22 |
| 4H              | 2H   | 12.51            | 13.29 | 13.45 | 14.23 | 15.45 | 12.17          | 12.94 | 13.11 | 13.88 | 15.10 |
|                 | 3H   | 14.37            | 15.02 | 15.32 | 15.99 | 17.22 | 13.98          | 14.63 | 14.93 | 15.60 | 16.83 |
|                 | 4H   | 15.08            | 15.67 | 16.04 | 16.64 | 17.89 | 14.68          | 15.27 | 15.64 | 16.23 | 17.49 |
|                 | 6H   | 15.59            | 16.10 | 16.56 | 17.09 | 18.35 | 15.18          | 15.70 | 16.16 | 16.68 | 17.94 |
|                 | 8H   | 15.73            | 16.21 | 16.71 | 17.19 | 18.47 | 15.33          | 15.81 | 16.30 | 16.79 | 18.06 |
|                 | 12H  | 15.81            | 16.24 | 16.80 | 17.23 | 18.51 | 15.39          | 15.82 | 16.38 | 16.82 | 18.10 |
| 8H              | 4H   | 15.28            | 15.75 | 16.25 | 16.74 | 18.01 | 14.92          | 15.40 | 15.89 | 16.38 | 17.65 |
|                 | 6H   | 15.90            | 16.29 | 16.90 | 17.32 | 18.59 | 15.54          | 15.94 | 16.54 | 16.96 | 18.23 |
|                 | 8H   | 16.11            | 16.46 | 17.12 | 17.47 | 18.76 | 15.75          | 16.10 | 16.76 | 17.11 | 18.40 |
|                 | 12H  | 16.24            | 16.55 | 17.25 | 17.55 | 18.89 | 15.86          | 16.17 | 16.87 | 17.17 | 18.51 |
| 12H             | 4H   | 15.26            | 15.69 | 16.26 | 16.69 | 17.97 | 14.91          | 15.35 | 15.91 | 16.34 | 17.62 |
|                 | 6H   | 15.93            | 16.28 | 16.93 | 17.29 | 18.58 | 15.58          | 15.93 | 16.59 | 16.94 | 18.23 |
|                 | 8H   | 16.16            | 16.47 | 17.18 | 17.48 | 18.81 | 15.81          | 16.12 | 16.82 | 17.12 | 18.46 |