

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: P920827

Luminaire Tested: DFN2DIP-TR3F0-060D080US935-FLLONL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P920827  
REPORT IS A COMBINATION OF REPORTS P901867 AND P898751  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-TR3F0-060D080US935-FLLONL  
Description: 3 foot, Triangle Define Geo, with Direct Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

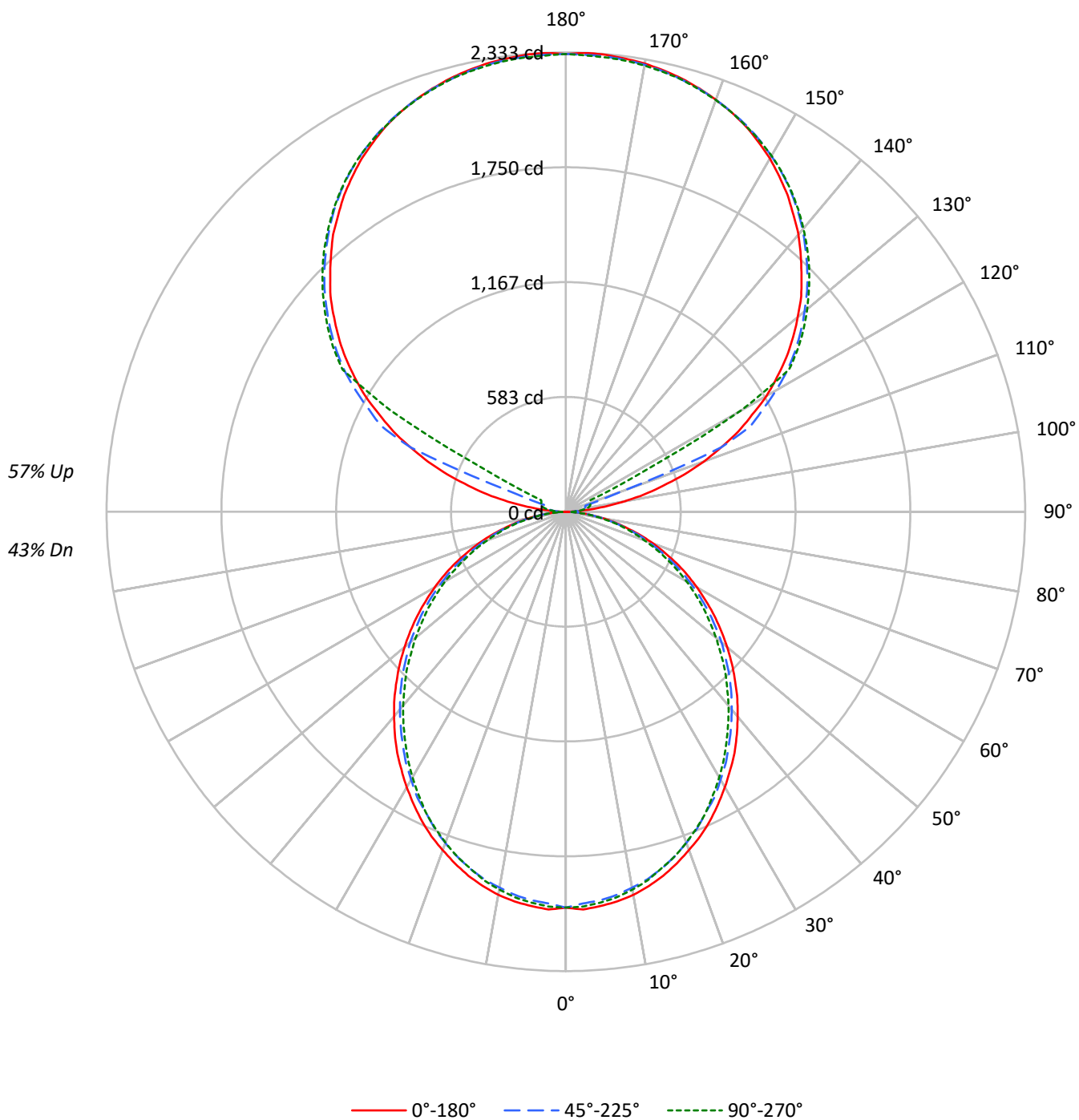
Lumens per Lamp: N/A  
Luminaire Lumens: 11933.4 lumens  
Efficiency: N/A  
Efficacy: 100.7 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 2.74' x L: 3.16' x H: 0.1')  
CIE Type: General Diffuse

Input Watts (W): 118.5  
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: P920827

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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 |    |    |    |    | 0  |
| RW  | 70  | 50  | 30  | 10  | 70 | 50 | 30 | 10 | 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 | 50 | 50 | 50 | 43 |    |    |
| 1   | 96  | 92  | 88  | 85  | 88 | 84 | 81 | 78 | 70 | 67 | 65 | 56 | 55 | 53 | 44 | 43 | 42 | 36 |    |    |
| 2   | 88  | 80  | 74  | 69  | 80 | 74 | 68 | 64 | 61 | 57 | 54 | 49 | 47 | 44 | 39 | 37 | 35 | 30 |    |    |
| 3   | 80  | 71  | 63  | 58  | 73 | 65 | 58 | 53 | 54 | 49 | 45 | 44 | 40 | 38 | 34 | 32 | 30 | 26 |    |    |
| 4   | 73  | 62  | 55  | 49  | 66 | 57 | 50 | 45 | 48 | 43 | 39 | 39 | 35 | 32 | 31 | 28 | 26 | 22 |    |    |
| 5   | 67  | 56  | 48  | 42  | 61 | 51 | 44 | 39 | 43 | 37 | 33 | 35 | 31 | 28 | 28 | 25 | 23 | 19 |    |    |
| 6   | 62  | 50  | 42  | 36  | 56 | 46 | 39 | 34 | 38 | 33 | 29 | 31 | 27 | 24 | 25 | 22 | 20 | 17 |    |    |
| 7   | 57  | 45  | 37  | 32  | 52 | 41 | 34 | 29 | 35 | 29 | 25 | 29 | 25 | 22 | 23 | 20 | 18 | 15 |    |    |
| 8   | 53  | 41  | 33  | 28  | 48 | 38 | 31 | 26 | 32 | 26 | 23 | 26 | 22 | 19 | 21 | 18 | 16 | 13 |    |    |
| 9   | 49  | 37  | 30  | 25  | 45 | 34 | 28 | 23 | 29 | 24 | 20 | 24 | 20 | 17 | 19 | 16 | 14 | 12 |    |    |
| 10  | 46  | 34  | 27  | 22  | 42 | 31 | 25 | 21 | 27 | 22 | 18 | 22 | 18 | 16 | 18 | 15 | 13 | 11 |    |    |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 2505 | 2505 | 2505 |
| 5°  | 2507 | 2468 | 2485 |
| 10° | 2486 | 2432 | 2450 |
| 15° | 2448 | 2390 | 2395 |
| 20° | 2397 | 2332 | 2340 |
| 25° | 2346 | 2264 | 2276 |
| 30° | 2283 | 2200 | 2195 |
| 35° | 2224 | 2125 | 2110 |
| 40° | 2150 | 2049 | 2029 |
| 45° | 2077 | 1972 | 1945 |
| 50° | 1997 | 1892 | 1849 |
| 55° | 1912 | 1799 | 1760 |
| 60° | 1817 | 1690 | 1658 |
| 65° | 1713 | 1575 | 1538 |
| 70° | 1581 | 1436 | 1408 |
| 75° | 1398 | 1269 | 1286 |
| 80° | 1177 | 1056 | 1057 |
| 85° | 830  | 695  | 683  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 2077 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 189.2   | 1.6       |
| 10°-20°   | 532.3   | 4.5       |
| 20°-30°   | 782.3   | 6.6       |
| 30°-40°   | 908.6   | 7.6       |
| 40°-50°   | 907.5   | 7.6       |
| 50°-60°   | 791.3   | 6.6       |
| 60°-70°   | 584.9   | 4.9       |
| 70°-80°   | 330.9   | 2.8       |
| 80°-90°   | 91.4    | 0.8       |
| 90°-100°  | 76.7    | 0.6       |
| 100°-110° | 285.7   | 2.4       |
| 110°-120° | 757.9   | 6.4       |
| 120°-130° | 1256.9  | 10.5      |
| 130°-140° | 1335.2  | 11.2      |
| 140°-150° | 1240.9  | 10.4      |
| 150°-160° | 997.6   | 8.4       |
| 160°-170° | 642.8   | 5.4       |
| 170°-180° | 221.3   | 1.9       |
| 0°-30°    | 1503.8  | 12.6      |
| 0°-40°    | 2412.4  | 20.2      |
| 0°-60°    | 4111.1  | 34.5      |
| 0°-90°    | 5118.4  | 42.9      |
| 90°-120°  | 1120.2  | 9.4       |
| 90°-150°  | 4953.3  | 41.5      |
| 90°-180°  | 6815.0  | 57.1      |
| 0°-180°   | 11933.4 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 2010 | 2010  | 2010 | 2010  | 2010 |      |
| 5°   | 2010 | 2002  | 1981 | 1997  | 1993 | 191  |
| 15°  | 1914 | 1902  | 1877 | 1885  | 1875 | 539  |
| 25°  | 1732 | 1716  | 1684 | 1687  | 1684 | 797  |
| 35°  | 1494 | 1475  | 1444 | 1432  | 1422 | 933  |
| 45°  | 1216 | 1202  | 1173 | 1152  | 1144 | 938  |
| 55°  | 920  | 908   | 885  | 862   | 852  | 823  |
| 65°  | 620  | 609   | 590  | 572   | 562  | 614  |
| 75°  | 325  | 321   | 311  | 300   | 304  | 347  |
| 85°  | 79   | 77    | 75   | 70    | 68   | 88   |
| 90°  | 2    | 20    | 34   | 42    | 45   | 11   |
| 95°  | 109  | 54    | 66   | 74    | 72   | 129  |
| 105° | 511  | 562   | 103  | 121   | 128  | 546  |
| 115° | 967  | 996   | 1038 | 259   | 138  | 952  |
| 125° | 1367 | 1389  | 1421 | 1433  | 1438 | 1220 |
| 135° | 1692 | 1719  | 1734 | 1751  | 1748 | 1307 |
| 145° | 1963 | 1961  | 1990 | 2002  | 1993 | 1228 |
| 155° | 2161 | 2146  | 2167 | 2177  | 2163 | 996  |
| 165° | 2278 | 2268  | 2272 | 2284  | 2272 | 643  |
| 175° | 2330 | 2318  | 2321 | 2333  | 2316 | 222  |
| 180° | 2325 | 2325  | 2325 | 2325  | 2325 |      |

TEST NUMBER: P920827

CATALOG NUMBER: DFN2DIP-TR3F0-060D080US935-FLLONL

**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 2010.1 | 2010.1 | 2010.1 | 2010.1 | 2010.1 |
| 2.5°   | 2021.8 | 2012.2 | 1990.8 | 2010.1 | 2006.4 |
| 5°     | 2010.1 | 2002.5 | 1981.2 | 1996.6 | 1992.9 |
| 7.5°   | 1996.6 | 1985.1 | 1963.8 | 1979.3 | 1975.5 |
| 10°    | 1975.5 | 1962.0 | 1938.7 | 1954.1 | 1948.4 |
| 12.5°  | 1946.4 | 1934.8 | 1911.7 | 1921.3 | 1917.4 |
| 15°    | 1913.5 | 1902.0 | 1876.8 | 1884.6 | 1875.0 |
| 17.5°  | 1872.9 | 1861.5 | 1836.3 | 1845.8 | 1836.3 |
| 20°    | 1828.4 | 1817.0 | 1789.8 | 1795.6 | 1788.0 |
| 22.5°  | 1784.2 | 1766.7 | 1741.5 | 1741.5 | 1737.6 |
| 25°    | 1731.8 | 1716.5 | 1683.6 | 1687.3 | 1683.6 |
| 27.5°  | 1673.8 | 1660.3 | 1635.2 | 1629.5 | 1619.9 |
| 30°    | 1616.0 | 1600.3 | 1571.5 | 1565.7 | 1557.9 |
| 32.5°  | 1554.0 | 1542.6 | 1511.6 | 1499.9 | 1492.1 |
| 35°    | 1494.2 | 1474.9 | 1443.9 | 1432.2 | 1422.5 |
| 37.5°  | 1426.5 | 1409.0 | 1378.1 | 1364.5 | 1354.9 |
| 40°    | 1356.9 | 1341.3 | 1310.4 | 1293.2 | 1285.4 |
| 42.5°  | 1289.3 | 1273.7 | 1242.9 | 1223.5 | 1211.9 |
| 45°    | 1215.9 | 1202.3 | 1173.2 | 1152.1 | 1144.3 |
| 47.5°  | 1144.3 | 1130.7 | 1099.8 | 1078.5 | 1066.9 |
| 50°    | 1068.8 | 1059.2 | 1032.2 | 1005.0 | 995.4  |
| 52.5°  | 995.4  | 981.9  | 956.8  | 935.6  | 922.0  |
| 55°    | 920.1  | 908.4  | 885.3  | 862.1  | 852.5  |
| 57.5°  | 844.7  | 835.1  | 809.9  | 786.7  | 778.9  |
| 60°    | 769.2  | 761.6  | 734.6  | 713.3  | 707.5  |
| 62.5°  | 695.8  | 682.3  | 663.0  | 643.7  | 635.9  |
| 65°    | 620.5  | 608.9  | 589.6  | 572.1  | 562.5  |
| 67.5°  | 543.2  | 533.4  | 516.2  | 502.7  | 494.8  |
| 70°    | 471.7  | 463.9  | 446.4  | 432.9  | 425.3  |
| 72.5°  | 398.2  | 390.5  | 380.8  | 367.3  | 361.5  |
| 75°    | 324.6  | 321.0  | 311.1  | 299.6  | 303.5  |
| 77.5°  | 259.0  | 251.2  | 247.3  | 241.6  | 235.8  |
| 80°    | 193.4  | 191.3  | 187.4  | 181.7  | 177.8  |
| 82.5°  | 131.5  | 131.5  | 129.6  | 121.8  | 121.8  |
| 85°    | 79.1   | 77.3   | 75.4   | 69.5   | 67.7   |
| 87.5°  | 34.9   | 31.0   | 27.0   | 21.4   | 19.3   |
| 90°    | 1.6    | 20.1   | 33.6   | 42.1   | 45.4   |
| 92.5°  | 42.1   | 35.4   | 40.4   | 43.7   | 45.4   |
| 95°    | 109.3  | 53.7   | 65.5   | 74.1   | 72.3   |
| 97.5°  | 196.7  | 58.9   | 85.7   | 90.9   | 92.5   |
| 100°   | 297.8  | 67.3   | 95.9   | 109.3  | 112.6  |
| 102.5° | 408.7  | 405.4  | 99.3   | 117.6  | 122.9  |
| 105°   | 511.3  | 561.9  | 102.6  | 121.1  | 127.9  |
| 107.5° | 630.8  | 672.7  | 106.1  | 124.4  | 131.2  |
| 110°   | 745.3  | 780.4  | 294.5  | 126.2  | 132.9  |

TEST NUMBER: P920827

CATALOG NUMBER: DFN2DIP-TR3F0-060D080US935-FLLONL

**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 852.9  | 883.0  | 854.5  | 129.4  | 134.7  |
| 115°   | 967.2  | 995.7  | 1037.8 | 259.1  | 138.0  |
| 117.5° | 1066.4 | 1100.0 | 1128.8 | 888.0  | 447.5  |
| 120°   | 1177.5 | 1202.6 | 1233.0 | 1253.2 | 1026.1 |
| 122.5° | 1271.5 | 1298.6 | 1332.3 | 1342.3 | 1344.1 |
| 125°   | 1367.4 | 1389.4 | 1421.3 | 1433.1 | 1438.1 |
| 127.5° | 1454.9 | 1478.5 | 1503.9 | 1520.6 | 1522.2 |
| 130°   | 1537.4 | 1564.3 | 1582.8 | 1601.4 | 1599.7 |
| 132.5° | 1621.5 | 1643.5 | 1661.9 | 1677.1 | 1675.4 |
| 135°   | 1692.2 | 1719.2 | 1734.1 | 1751.2 | 1747.7 |
| 137.5° | 1766.2 | 1786.3 | 1803.3 | 1820.1 | 1815.1 |
| 140°   | 1838.4 | 1852.0 | 1870.4 | 1885.6 | 1877.1 |
| 142.5° | 1899.2 | 1910.9 | 1932.7 | 1946.1 | 1937.7 |
| 145°   | 1963.1 | 1961.3 | 1989.9 | 2001.6 | 1993.2 |
| 147.5° | 2018.4 | 2013.4 | 2041.9 | 2050.4 | 2043.8 |
| 150°   | 2072.3 | 2060.5 | 2087.5 | 2097.5 | 2089.1 |
| 152.5° | 2117.7 | 2104.3 | 2129.4 | 2139.7 | 2127.9 |
| 155°   | 2161.4 | 2146.5 | 2166.6 | 2176.6 | 2163.3 |
| 157.5° | 2196.7 | 2183.4 | 2198.6 | 2210.4 | 2196.7 |
| 160°   | 2227.1 | 2217.0 | 2227.1 | 2237.1 | 2225.3 |
| 162.5° | 2253.9 | 2243.9 | 2252.3 | 2264.1 | 2248.9 |
| 165°   | 2277.5 | 2267.5 | 2272.5 | 2284.2 | 2272.5 |
| 167.5° | 2296.0 | 2285.9 | 2291.0 | 2302.8 | 2287.7 |
| 170°   | 2311.3 | 2301.0 | 2304.5 | 2316.3 | 2301.0 |
| 172.5° | 2321.3 | 2311.3 | 2314.6 | 2326.4 | 2311.3 |
| 175°   | 2329.6 | 2317.8 | 2321.3 | 2333.0 | 2316.3 |
| 177.5° | 2333.0 | 2321.3 | 2323.0 | 2334.8 | 2319.6 |
| 180°   | 2324.6 | 2324.6 | 2324.6 | 2324.6 | 2324.6 |

TEST NUMBER: P920827

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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 | 9.72             | 10.52 | 10.73 | 11.54 | 12.91 | 9.29           | 10.09 | 10.30 | 11.11 | 12.48 |
|                 | 3H   | 11.36            | 12.08 | 12.39 | 13.11 | 14.50 | 10.89          | 11.61 | 11.92 | 12.65 | 14.04 |
|                 | 4H   | 11.94            | 12.62 | 12.98 | 13.66 | 15.05 | 11.47          | 12.15 | 12.51 | 13.19 | 14.59 |
|                 | 6H   | 12.33            | 12.96 | 13.38 | 14.00 | 15.41 | 11.86          | 12.49 | 12.91 | 13.53 | 14.94 |
|                 | 8H   | 12.43            | 13.03 | 13.48 | 14.08 | 15.49 | 11.96          | 12.56 | 13.01 | 13.61 | 15.02 |
|                 | 12H  | 12.47            | 13.04 | 13.53 | 14.09 | 15.52 | 12.00          | 12.57 | 13.06 | 13.62 | 15.04 |
| 4H              | 2H   | 10.17            | 10.85 | 11.21 | 11.88 | 13.28 | 9.82           | 10.50 | 10.87 | 11.54 | 12.94 |
|                 | 3H   | 12.02            | 12.58 | 13.07 | 13.65 | 15.06 | 11.63          | 12.19 | 12.68 | 13.26 | 14.67 |
|                 | 4H   | 12.72            | 13.24 | 13.78 | 14.30 | 15.73 | 12.32          | 12.84 | 13.38 | 13.90 | 15.33 |
|                 | 6H   | 13.22            | 13.67 | 14.29 | 14.75 | 16.18 | 12.82          | 13.27 | 13.89 | 14.35 | 15.77 |
|                 | 8H   | 13.37            | 13.78 | 14.44 | 14.86 | 16.30 | 12.96          | 13.38 | 14.03 | 14.45 | 15.89 |
|                 | 12H  | 13.43            | 13.81 | 14.52 | 14.90 | 16.34 | 13.02          | 13.40 | 14.10 | 14.48 | 15.93 |
| 8H              | 4H   | 12.91            | 13.33 | 13.98 | 14.40 | 15.84 | 12.55          | 12.97 | 13.62 | 14.04 | 15.48 |
|                 | 6H   | 13.53            | 13.87 | 14.62 | 14.98 | 16.42 | 13.17          | 13.51 | 14.26 | 14.63 | 16.07 |
|                 | 8H   | 13.74            | 14.04 | 14.84 | 15.14 | 16.60 | 13.38          | 13.68 | 14.48 | 14.78 | 16.23 |
|                 | 12H  | 13.86            | 14.13 | 14.97 | 15.22 | 16.72 | 13.48          | 13.75 | 14.59 | 14.84 | 16.34 |
| 12H             | 4H   | 12.89            | 13.27 | 13.98 | 14.35 | 15.80 | 12.54          | 12.92 | 13.63 | 14.00 | 15.45 |
|                 | 6H   | 13.55            | 13.86 | 14.65 | 14.95 | 16.41 | 13.21          | 13.51 | 14.31 | 14.61 | 16.06 |
|                 | 8H   | 13.79            | 14.05 | 14.89 | 15.14 | 16.64 | 13.43          | 13.70 | 14.54 | 14.79 | 16.29 |