

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: P915551

Luminaire Tested: DFN2DIP-TR4F0-060D100US927-FLLONL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P915551  
REPORT IS A COMBINATION OF REPORTS P902001 AND P898849  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-TR4F0-060D100US927-FLLONL  
Description: 4 foot, Triangle Define Geo, with Direct Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

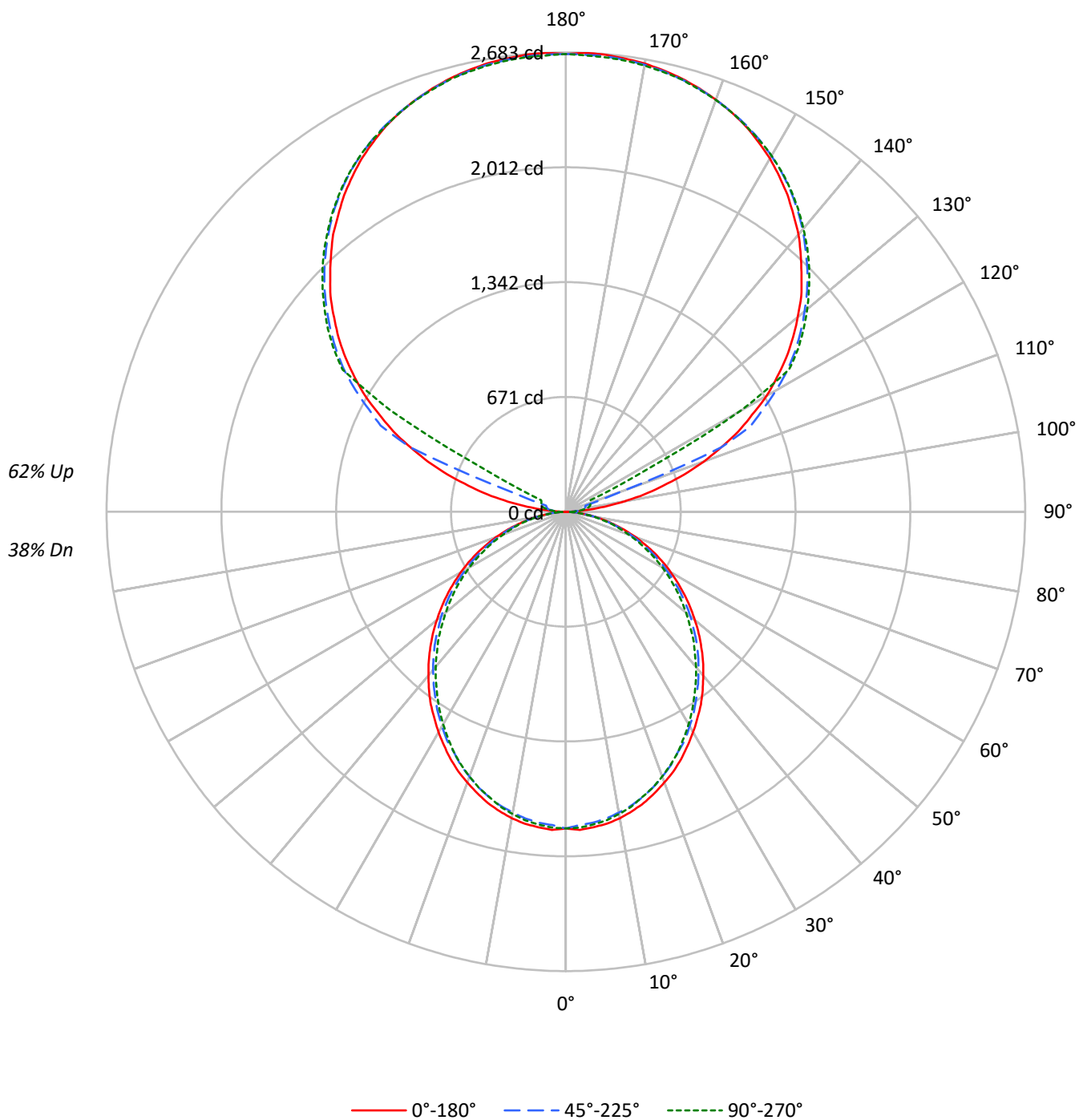
**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 12548.1 lumens  
Efficiency: N/A  
Efficacy: 96.7 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 3.43' x L: 3.96' x H: 0.1')  
CIE Type: Semi-Indirect  
  
Input Watts (W): 129.7  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9781  
Total Harmonic Distortion (THDi): 0.075  
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



TEST NUMBER: P915551

CATALOG NUMBER: DFN2DIP-TR4F0-060D100US927-FLONL

**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   | 104 | 104 | 104 | 104 | 94 | 94 | 94 | 94 | 76 | 76 | 76 | 60 | 60 | 60 | 45 | 45 | 45 |
| 1   | 95  | 91  | 87  | 83  | 86 | 82 | 79 | 76 | 67 | 65 | 63 | 53 | 51 | 50 | 39 | 39 | 38 |
| 2   | 86  | 79  | 73  | 68  | 78 | 72 | 67 | 63 | 59 | 55 | 52 | 46 | 44 | 42 | 35 | 33 | 32 |
| 3   | 79  | 70  | 62  | 57  | 71 | 63 | 57 | 52 | 52 | 47 | 44 | 41 | 38 | 35 | 31 | 29 | 27 |
| 4   | 72  | 62  | 54  | 48  | 65 | 56 | 49 | 44 | 46 | 41 | 37 | 36 | 33 | 30 | 27 | 25 | 23 |
| 5   | 66  | 55  | 47  | 41  | 60 | 50 | 43 | 38 | 41 | 36 | 32 | 33 | 29 | 26 | 25 | 22 | 20 |
| 6   | 61  | 49  | 41  | 35  | 55 | 45 | 38 | 33 | 37 | 32 | 28 | 29 | 26 | 23 | 22 | 20 | 18 |
| 7   | 56  | 44  | 36  | 31  | 51 | 40 | 34 | 29 | 33 | 28 | 24 | 27 | 23 | 20 | 20 | 18 | 16 |
| 8   | 52  | 40  | 32  | 27  | 47 | 37 | 30 | 25 | 30 | 25 | 22 | 24 | 21 | 18 | 19 | 16 | 14 |
| 9   | 48  | 36  | 29  | 24  | 44 | 33 | 27 | 23 | 28 | 23 | 19 | 22 | 19 | 16 | 17 | 15 | 13 |
| 10  | 45  | 33  | 26  | 22  | 41 | 31 | 24 | 20 | 26 | 21 | 17 | 21 | 17 | 14 | 16 | 13 | 12 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 1469 | 1469 | 1469 |
| 5°  | 1472 | 1449 | 1459 |
| 10° | 1460 | 1429 | 1439 |
| 15° | 1438 | 1406 | 1408 |
| 20° | 1409 | 1373 | 1376 |
| 25° | 1380 | 1334 | 1340 |
| 30° | 1344 | 1298 | 1293 |
| 35° | 1310 | 1255 | 1244 |
| 40° | 1268 | 1211 | 1197 |
| 45° | 1226 | 1168 | 1149 |
| 50° | 1180 | 1122 | 1094 |
| 55° | 1132 | 1069 | 1043 |
| 60° | 1077 | 1007 | 984  |
| 65° | 1018 | 942  | 915  |
| 70° | 943  | 863  | 841  |
| 75° | 838  | 768  | 773  |
| 80° | 712  | 648  | 642  |
| 85° | 515  | 439  | 426  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 90°

Vertical Angle: 90°

Luminance: 1418 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 174.1   | 1.4       |
| 10°-20°   | 489.8   | 3.9       |
| 20°-30°   | 719.8   | 5.7       |
| 30°-40°   | 836.0   | 6.7       |
| 40°-50°   | 834.9   | 6.7       |
| 50°-60°   | 728.0   | 5.8       |
| 60°-70°   | 538.2   | 4.3       |
| 70°-80°   | 304.5   | 2.4       |
| 80°-90°   | 85.1    | 0.7       |
| 90°-100°  | 88.1    | 0.7       |
| 100°-110° | 328.6   | 2.6       |
| 110°-120° | 871.6   | 6.9       |
| 120°-130° | 1445.6  | 11.5      |
| 130°-140° | 1535.6  | 12.2      |
| 140°-150° | 1427.1  | 11.4      |
| 150°-160° | 1147.4  | 9.1       |
| 160°-170° | 739.3   | 5.9       |
| 170°-180° | 254.5   | 2.0       |
| 0°-30°    | 1383.6  | 11.0      |
| 0°-40°    | 2219.6  | 17.7      |
| 0°-60°    | 3782.5  | 30.1      |
| 0°-90°    | 4710.2  | 37.5      |
| 90°-120°  | 1288.4  | 10.3      |
| 90°-150°  | 5696.7  | 45.4      |
| 90°-180°  | 7838.0  | 62.5      |
| 0°-180°   | 12548.1 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 1849 | 1849  | 1849 | 1849  | 1849 |      |
| 5°   | 1849 | 1842  | 1823 | 1837  | 1834 | 176  |
| 15°  | 1760 | 1750  | 1727 | 1734  | 1725 | 496  |
| 25°  | 1593 | 1579  | 1549 | 1552  | 1549 | 733  |
| 35°  | 1375 | 1357  | 1328 | 1318  | 1309 | 858  |
| 45°  | 1119 | 1106  | 1079 | 1060  | 1053 | 863  |
| 55°  | 847  | 836   | 814  | 793   | 784  | 757  |
| 65°  | 571  | 560   | 542  | 526   | 518  | 564  |
| 75°  | 299  | 295   | 286  | 276   | 279  | 319  |
| 85°  | 73   | 71    | 69   | 64    | 62   | 81   |
| 90°  | 2    | 23    | 39   | 48    | 52   | 12   |
| 95°  | 126  | 62    | 75   | 85    | 83   | 149  |
| 105° | 588  | 646   | 118  | 139   | 147  | 628  |
| 115° | 1112 | 1145  | 1194 | 298   | 159  | 1095 |
| 125° | 1573 | 1598  | 1635 | 1648  | 1654 | 1403 |
| 135° | 1946 | 1977  | 1994 | 2014  | 2010 | 1503 |
| 145° | 2258 | 2256  | 2288 | 2302  | 2292 | 1412 |
| 155° | 2486 | 2469  | 2492 | 2503  | 2488 | 1146 |
| 165° | 2619 | 2608  | 2614 | 2627  | 2614 | 740  |
| 175° | 2679 | 2666  | 2670 | 2683  | 2664 | 255  |
| 180° | 2674 | 2674  | 2674 | 2674  | 2674 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 1849.4 | 1849.4 | 1849.4 | 1849.4 | 1849.4 |
| 2.5°   | 1860.2 | 1851.3 | 1831.7 | 1849.4 | 1846.0 |
| 5°     | 1849.4 | 1842.5 | 1822.8 | 1837.0 | 1833.6 |
| 7.5°   | 1837.0 | 1826.5 | 1806.8 | 1821.1 | 1817.6 |
| 10°    | 1817.6 | 1805.1 | 1783.8 | 1797.9 | 1792.6 |
| 12.5°  | 1790.8 | 1780.2 | 1758.9 | 1767.8 | 1764.2 |
| 15°    | 1760.5 | 1750.0 | 1726.8 | 1734.0 | 1725.1 |
| 17.5°  | 1723.2 | 1712.7 | 1689.5 | 1698.3 | 1689.5 |
| 20°    | 1682.3 | 1671.7 | 1646.8 | 1652.1 | 1645.1 |
| 22.5°  | 1641.6 | 1625.5 | 1602.3 | 1602.3 | 1598.7 |
| 25°    | 1593.4 | 1579.3 | 1549.0 | 1552.4 | 1549.0 |
| 27.5°  | 1540.0 | 1527.6 | 1504.5 | 1499.3 | 1490.4 |
| 30°    | 1486.8 | 1472.4 | 1445.9 | 1440.6 | 1433.4 |
| 32.5°  | 1429.8 | 1419.3 | 1390.8 | 1380.0 | 1372.8 |
| 35°    | 1374.8 | 1357.0 | 1328.5 | 1317.7 | 1308.8 |
| 37.5°  | 1312.5 | 1296.4 | 1268.0 | 1255.4 | 1246.6 |
| 40°    | 1248.5 | 1234.1 | 1205.7 | 1189.9 | 1182.6 |
| 42.5°  | 1186.2 | 1171.9 | 1143.6 | 1125.7 | 1115.1 |
| 45°    | 1118.7 | 1106.2 | 1079.4 | 1060.0 | 1052.8 |
| 47.5°  | 1052.8 | 1040.4 | 1011.9 | 992.3  | 981.7  |
| 50°    | 983.4  | 974.5  | 949.7  | 924.7  | 915.8  |
| 52.5°  | 915.8  | 903.4  | 880.4  | 860.8  | 848.3  |
| 55°    | 846.6  | 835.8  | 814.5  | 793.2  | 784.3  |
| 57.5°  | 777.2  | 768.3  | 745.1  | 723.8  | 716.6  |
| 60°    | 707.7  | 700.8  | 675.9  | 656.2  | 650.9  |
| 62.5°  | 640.2  | 627.7  | 610.0  | 592.2  | 585.1  |
| 65°    | 570.9  | 560.2  | 542.5  | 526.4  | 517.5  |
| 67.5°  | 499.8  | 490.8  | 474.9  | 462.5  | 455.3  |
| 70°    | 434.0  | 426.8  | 410.7  | 398.3  | 391.3  |
| 72.5°  | 366.4  | 359.3  | 350.4  | 337.9  | 332.6  |
| 75°    | 298.7  | 295.3  | 286.2  | 275.7  | 279.2  |
| 77.5°  | 238.3  | 231.2  | 227.5  | 222.3  | 217.0  |
| 80°    | 177.9  | 176.0  | 172.5  | 167.2  | 163.6  |
| 82.5°  | 121.0  | 121.0  | 119.2  | 112.1  | 112.1  |
| 85°    | 72.8   | 71.1   | 69.4   | 63.9   | 62.3   |
| 87.5°  | 32.1   | 28.5   | 24.9   | 19.6   | 17.7   |
| 90°    | 1.8    | 23.2   | 38.6   | 48.5   | 52.1   |
| 92.5°  | 48.5   | 40.6   | 46.4   | 50.3   | 52.1   |
| 95°    | 125.6  | 61.8   | 75.3   | 85.2   | 83.2   |
| 97.5°  | 226.2  | 67.7   | 98.5   | 104.5  | 106.4  |
| 100°   | 342.5  | 77.4   | 110.3  | 125.6  | 129.6  |
| 102.5° | 470.0  | 466.4  | 114.2  | 135.3  | 141.2  |
| 105°   | 588.1  | 646.2  | 118.1  | 139.2  | 147.0  |
| 107.5° | 725.5  | 773.7  | 122.0  | 143.1  | 150.9  |
| 110°   | 857.1  | 897.5  | 338.6  | 145.2  | 152.7  |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 980.9  | 1015.6 | 982.8  | 148.9  | 154.9  |
| 115°   | 1112.3 | 1145.2 | 1193.7 | 297.9  | 158.8  |
| 117.5° | 1226.5 | 1265.1 | 1298.1 | 1021.4 | 514.6  |
| 120°   | 1354.2 | 1383.1 | 1418.1 | 1441.3 | 1180.1 |
| 122.5° | 1462.4 | 1493.4 | 1532.2 | 1543.7 | 1545.8 |
| 125°   | 1572.7 | 1598.0 | 1634.7 | 1648.3 | 1654.0 |
| 127.5° | 1673.3 | 1700.4 | 1729.6 | 1748.9 | 1750.7 |
| 130°   | 1768.1 | 1799.2 | 1820.4 | 1841.7 | 1839.8 |
| 132.5° | 1864.9 | 1890.1 | 1911.3 | 1928.7 | 1926.9 |
| 135°   | 1946.2 | 1977.2 | 1994.5 | 2014.0 | 2010.1 |
| 137.5° | 2031.2 | 2054.4 | 2073.9 | 2093.3 | 2087.5 |
| 140°   | 2114.3 | 2130.0 | 2151.1 | 2168.6 | 2158.9 |
| 142.5° | 2184.2 | 2197.7 | 2222.8 | 2238.1 | 2228.6 |
| 145°   | 2257.7 | 2255.7 | 2288.5 | 2302.1 | 2292.4 |
| 147.5° | 2321.3 | 2315.6 | 2348.4 | 2358.1 | 2350.6 |
| 150°   | 2383.4 | 2369.8 | 2400.9 | 2412.4 | 2402.7 |
| 152.5° | 2435.5 | 2420.1 | 2449.1 | 2460.8 | 2447.2 |
| 155°   | 2485.9 | 2468.6 | 2491.8 | 2503.3 | 2487.9 |
| 157.5° | 2526.5 | 2511.1 | 2528.6 | 2542.1 | 2526.5 |
| 160°   | 2561.4 | 2549.7 | 2561.4 | 2572.9 | 2559.4 |
| 162.5° | 2592.2 | 2580.7 | 2590.4 | 2603.9 | 2586.5 |
| 165°   | 2619.3 | 2607.8 | 2613.6 | 2627.1 | 2613.6 |
| 167.5° | 2640.7 | 2628.9 | 2635.0 | 2648.5 | 2631.0 |
| 170°   | 2658.1 | 2646.4 | 2650.3 | 2663.9 | 2646.4 |
| 172.5° | 2669.6 | 2658.1 | 2662.0 | 2675.6 | 2658.1 |
| 175°   | 2679.2 | 2665.7 | 2669.6 | 2683.2 | 2663.9 |
| 177.5° | 2683.2 | 2669.6 | 2671.7 | 2685.3 | 2667.7 |
| 180°   | 2673.5 | 2673.5 | 2673.5 | 2673.5 | 2673.5 |

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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 | 7.33             | 8.09  | 8.39  | 9.15  | 10.59 | 6.90           | 7.66  | 7.95  | 8.72  | 10.16 |
|                 | 3H   | 8.98             | 9.66  | 10.05 | 10.73 | 12.19 | 8.51           | 9.19  | 9.57  | 10.26 | 11.72 |
|                 | 4H   | 9.56             | 10.21 | 10.64 | 11.28 | 12.74 | 9.09           | 9.74  | 10.17 | 10.81 | 12.27 |
|                 | 6H   | 9.96             | 10.55 | 11.04 | 11.63 | 13.10 | 9.48           | 10.08 | 10.57 | 11.15 | 12.63 |
|                 | 8H   | 10.06            | 10.62 | 11.15 | 11.72 | 13.19 | 9.58           | 10.15 | 10.68 | 11.24 | 12.71 |
|                 | 12H  | 10.10            | 10.64 | 11.20 | 11.73 | 13.22 | 9.62           | 10.16 | 10.72 | 11.25 | 12.74 |
| 4H              | 2H   | 7.78             | 8.42  | 8.86  | 9.49  | 10.96 | 7.43           | 8.08  | 8.52  | 9.15  | 10.61 |
|                 | 3H   | 9.63             | 10.17 | 10.73 | 11.27 | 12.75 | 9.24           | 9.78  | 10.33 | 10.88 | 12.35 |
|                 | 4H   | 10.34            | 10.84 | 11.44 | 11.93 | 13.42 | 9.94           | 10.43 | 11.04 | 11.52 | 13.02 |
|                 | 6H   | 10.85            | 11.28 | 11.96 | 12.39 | 13.88 | 10.44          | 10.87 | 11.55 | 11.98 | 13.47 |
|                 | 8H   | 11.00            | 11.40 | 12.11 | 12.50 | 14.01 | 10.59          | 10.98 | 11.69 | 12.09 | 13.60 |
|                 | 12H  | 11.07            | 11.43 | 12.19 | 12.54 | 14.06 | 10.65          | 11.01 | 11.77 | 12.12 | 13.63 |
| 8H              | 4H   | 10.53            | 10.93 | 11.64 | 12.03 | 13.54 | 10.17          | 10.57 | 11.28 | 11.67 | 13.18 |
|                 | 6H   | 11.16            | 11.49 | 12.29 | 12.63 | 14.14 | 10.80          | 11.12 | 11.92 | 12.27 | 13.77 |
|                 | 8H   | 11.38            | 11.67 | 12.51 | 12.79 | 14.32 | 11.01          | 11.30 | 12.14 | 12.42 | 13.95 |
|                 | 12H  | 11.51            | 11.76 | 12.64 | 12.88 | 14.44 | 11.12          | 11.37 | 12.26 | 12.50 | 14.06 |
| 12H             | 4H   | 10.51            | 10.87 | 11.64 | 11.99 | 13.50 | 10.16          | 10.52 | 11.28 | 11.64 | 13.15 |
|                 | 6H   | 11.19            | 11.48 | 12.32 | 12.60 | 14.13 | 10.84          | 11.12 | 11.97 | 12.25 | 13.77 |
|                 | 8H   | 11.43            | 11.68 | 12.56 | 12.80 | 14.36 | 11.07          | 11.32 | 12.21 | 12.44 | 14.00 |