

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: P926467

Luminaire Tested: DFN2DIP-TR4F0-060D110US950-FLLONL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P926467  
REPORT IS A COMBINATION OF REPORTS P902019 AND P898849  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-TR4F0-060D110US950-FLLONL  
Description: 4 foot, Triangle Define Geo, with Direct Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

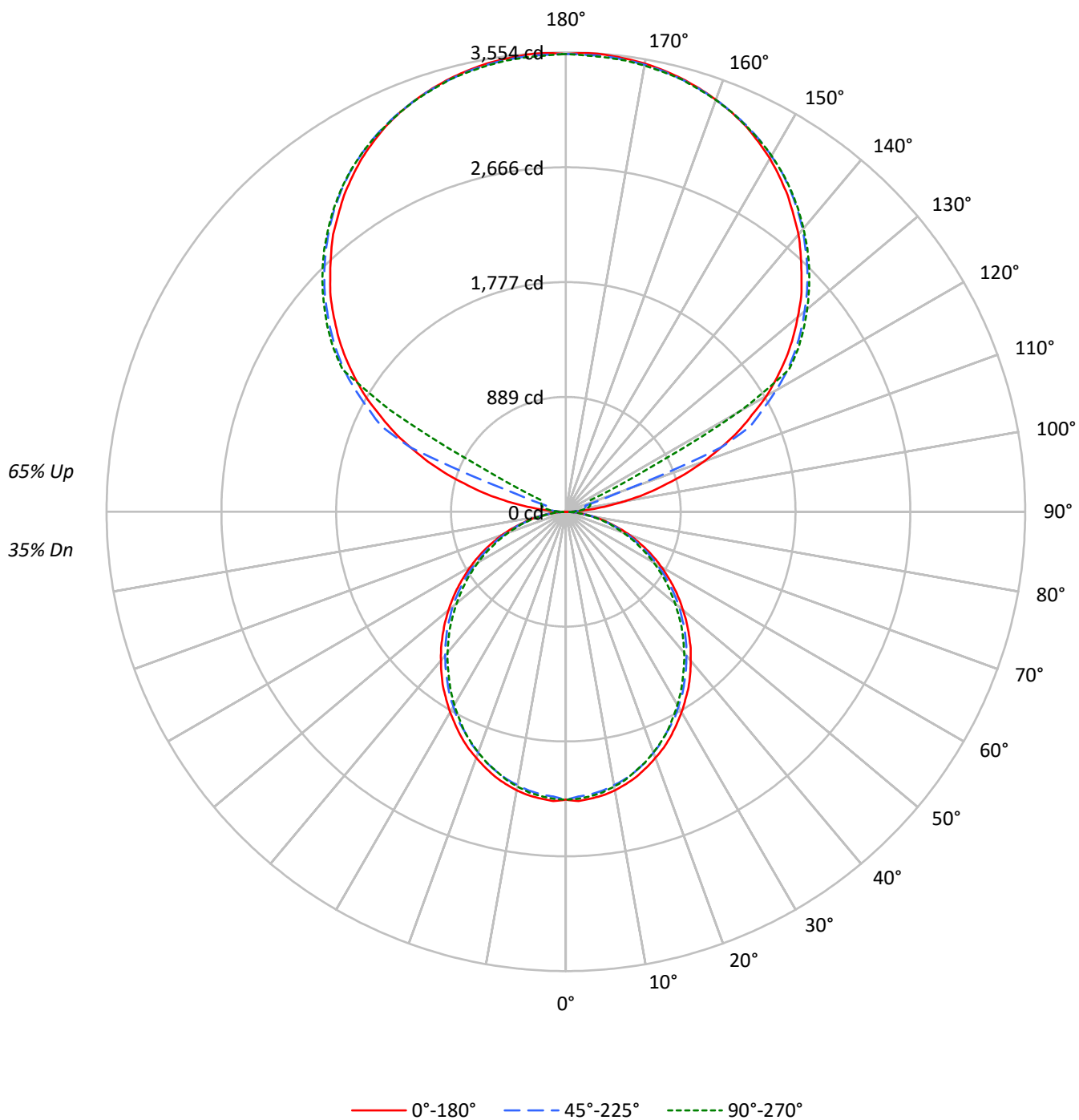
Lumens per Lamp: N/A  
Luminaire Lumens: 16055.8 lumens  
Efficiency: N/A  
Efficacy: 116.3 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 3.43' x L: 3.96' x H: 0.1')  
CIE Type: Semi-Indirect

Input Watts (W): 138.1  
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

TEST NUMBER: P926467

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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   | 104 | 104 | 104 | 104 | 94 | 94 | 94 | 94 | 75 | 75 | 75 | 58 | 58 | 58 | 43 | 43 | 43 | 35 |    |    |
| 1   | 95  | 90  | 86  | 83  | 85 | 82 | 79 | 76 | 66 | 64 | 62 | 51 | 50 | 48 | 38 | 37 | 36 | 30 |    |    |
| 2   | 86  | 79  | 73  | 68  | 78 | 71 | 66 | 62 | 58 | 54 | 51 | 45 | 43 | 40 | 33 | 32 | 30 | 25 |    |    |
| 3   | 78  | 69  | 62  | 56  | 71 | 63 | 57 | 52 | 51 | 46 | 43 | 40 | 37 | 34 | 29 | 27 | 26 | 21 |    |    |
| 4   | 72  | 61  | 53  | 48  | 65 | 56 | 49 | 44 | 45 | 40 | 36 | 35 | 32 | 29 | 26 | 24 | 22 | 18 |    |    |
| 5   | 66  | 54  | 46  | 41  | 59 | 50 | 43 | 38 | 40 | 35 | 31 | 32 | 28 | 25 | 24 | 21 | 19 | 16 |    |    |
| 6   | 60  | 49  | 41  | 35  | 54 | 44 | 37 | 32 | 36 | 31 | 27 | 29 | 25 | 22 | 21 | 19 | 17 | 14 |    |    |
| 7   | 56  | 44  | 36  | 31  | 50 | 40 | 33 | 28 | 33 | 28 | 24 | 26 | 22 | 19 | 20 | 17 | 15 | 12 |    |    |
| 8   | 52  | 40  | 32  | 27  | 47 | 36 | 30 | 25 | 30 | 25 | 21 | 24 | 20 | 17 | 18 | 15 | 13 | 11 |    |    |
| 9   | 48  | 36  | 29  | 24  | 43 | 33 | 27 | 22 | 27 | 22 | 19 | 22 | 18 | 15 | 17 | 14 | 12 | 10 |    |    |
| 10  | 45  | 33  | 26  | 21  | 41 | 30 | 24 | 20 | 25 | 20 | 17 | 20 | 16 | 14 | 15 | 13 | 11 | 9  |    |    |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 1769 | 1769 | 1769 |
| 5°  | 1772 | 1745 | 1756 |
| 10° | 1758 | 1721 | 1733 |
| 15° | 1732 | 1693 | 1695 |
| 20° | 1697 | 1653 | 1657 |
| 25° | 1662 | 1606 | 1613 |
| 30° | 1619 | 1563 | 1557 |
| 35° | 1578 | 1511 | 1498 |
| 40° | 1527 | 1459 | 1442 |
| 45° | 1476 | 1406 | 1384 |
| 50° | 1421 | 1351 | 1317 |
| 55° | 1363 | 1288 | 1256 |
| 60° | 1297 | 1212 | 1186 |
| 65° | 1226 | 1134 | 1102 |
| 70° | 1135 | 1039 | 1013 |
| 75° | 1009 | 925  | 931  |
| 80° | 857  | 780  | 773  |
| 85° | 620  | 529  | 513  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 90°

Vertical Angle: 90°

Luminance: 1881 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 209.6   | 1.3       |
| 10°-20°   | 589.8   | 3.7       |
| 20°-30°   | 866.8   | 5.4       |
| 30°-40°   | 1006.7  | 6.3       |
| 40°-50°   | 1005.5  | 6.3       |
| 50°-60°   | 876.7   | 5.5       |
| 60°-70°   | 648.1   | 4.0       |
| 70°-80°   | 366.7   | 2.3       |
| 80°-90°   | 103.0   | 0.6       |
| 90°-100°  | 116.8   | 0.7       |
| 100°-110° | 435.4   | 2.7       |
| 110°-120° | 1154.6  | 7.2       |
| 120°-130° | 1915.0  | 11.9      |
| 130°-140° | 2034.2  | 12.7      |
| 140°-150° | 1890.5  | 11.8      |
| 150°-160° | 1519.9  | 9.5       |
| 160°-170° | 979.4   | 6.1       |
| 170°-180° | 337.1   | 2.1       |
| 0°-30°    | 1666.2  | 10.4      |
| 0°-40°    | 2673.0  | 16.6      |
| 0°-60°    | 4555.2  | 28.4      |
| 0°-90°    | 5673.0  | 35.3      |
| 90°-120°  | 1706.7  | 10.6      |
| 90°-150°  | 7546.4  | 47.0      |
| 90°-180°  | 10383.0 | 64.7      |
| 0°-180°   | 16055.8 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 2227 | 2227  | 2227 | 2227  | 2227 |      |
| 5°   | 2227 | 2219  | 2195 | 2212  | 2208 | 211  |
| 15°  | 2120 | 2108  | 2080 | 2088  | 2078 | 597  |
| 25°  | 1919 | 1902  | 1866 | 1870  | 1866 | 883  |
| 35°  | 1656 | 1634  | 1600 | 1587  | 1576 | 1034 |
| 45°  | 1347 | 1332  | 1300 | 1276  | 1268 | 1040 |
| 55°  | 1020 | 1007  | 981  | 955   | 945  | 912  |
| 65°  | 688  | 675   | 653  | 634   | 623  | 680  |
| 75°  | 360  | 356   | 345  | 332   | 336  | 384  |
| 85°  | 88   | 86    | 84   | 77    | 75   | 98   |
| 90°  | 2    | 31    | 51   | 64    | 69   | 15   |
| 95°  | 166  | 82    | 100  | 113   | 110  | 197  |
| 105° | 779  | 856   | 156  | 184   | 195  | 832  |
| 115° | 1474 | 1517  | 1581 | 395   | 210  | 1451 |
| 125° | 2083 | 2117  | 2166 | 2183  | 2191 | 1858 |
| 135° | 2578 | 2619  | 2642 | 2668  | 2663 | 1992 |
| 145° | 2991 | 2988  | 3032 | 3050  | 3037 | 1871 |
| 155° | 3293 | 3270  | 3301 | 3316  | 3296 | 1517 |
| 165° | 3470 | 3454  | 3462 | 3480  | 3462 | 980  |
| 175° | 3549 | 3531  | 3536 | 3554  | 3529 | 338  |
| 180° | 3542 | 3542  | 3542 | 3542  | 3542 |      |

TEST NUMBER: P926467

CATALOG NUMBER: DFN2DIP-TR4F0-060D110US950-FLLONL

**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 2227.2 | 2227.2 | 2227.2 | 2227.2 | 2227.2 |
| 2.5°   | 2240.2 | 2229.5 | 2205.8 | 2227.2 | 2223.1 |
| 5°     | 2227.2 | 2218.8 | 2195.2 | 2212.2 | 2208.1 |
| 7.5°   | 2212.2 | 2199.5 | 2175.9 | 2193.2 | 2188.9 |
| 10°    | 2188.9 | 2173.9 | 2148.1 | 2165.2 | 2158.8 |
| 12.5°  | 2156.6 | 2143.8 | 2118.2 | 2128.9 | 2124.6 |
| 15°    | 2120.2 | 2107.5 | 2079.5 | 2088.2 | 2077.5 |
| 17.5°  | 2075.2 | 2062.5 | 2034.6 | 2045.2 | 2034.6 |
| 20°    | 2025.9 | 2013.2 | 1983.2 | 1989.6 | 1981.2 |
| 22.5°  | 1976.9 | 1957.5 | 1929.6 | 1929.6 | 1925.3 |
| 25°    | 1918.9 | 1901.9 | 1865.5 | 1869.6 | 1865.5 |
| 27.5°  | 1854.6 | 1839.6 | 1811.8 | 1805.5 | 1794.9 |
| 30°    | 1790.6 | 1773.2 | 1741.2 | 1734.8 | 1726.2 |
| 32.5°  | 1721.9 | 1709.2 | 1674.8 | 1661.9 | 1653.3 |
| 35°    | 1655.6 | 1634.2 | 1599.9 | 1586.9 | 1576.2 |
| 37.5°  | 1580.6 | 1561.2 | 1527.0 | 1511.9 | 1501.2 |
| 40°    | 1503.5 | 1486.2 | 1452.0 | 1432.9 | 1424.2 |
| 42.5°  | 1428.5 | 1411.3 | 1377.2 | 1355.6 | 1342.9 |
| 45°    | 1347.2 | 1332.2 | 1299.9 | 1276.5 | 1267.9 |
| 47.5°  | 1267.9 | 1252.9 | 1218.6 | 1195.0 | 1182.2 |
| 50°    | 1184.3 | 1173.6 | 1143.7 | 1113.6 | 1102.9 |
| 52.5°  | 1102.9 | 1087.9 | 1060.2 | 1036.6 | 1021.6 |
| 55°    | 1019.5 | 1006.6 | 980.9  | 955.2  | 944.6  |
| 57.5°  | 936.0  | 925.3  | 897.3  | 871.7  | 863.0  |
| 60°    | 852.3  | 843.9  | 814.0  | 790.3  | 783.9  |
| 62.5°  | 770.9  | 755.9  | 734.6  | 713.2  | 704.6  |
| 65°    | 687.5  | 674.7  | 653.3  | 633.9  | 623.2  |
| 67.5°  | 601.9  | 591.0  | 571.9  | 556.9  | 548.3  |
| 70°    | 522.6  | 514.0  | 494.6  | 479.7  | 471.3  |
| 72.5°  | 441.2  | 432.6  | 422.0  | 407.0  | 400.6  |
| 75°    | 359.7  | 355.7  | 344.7  | 332.0  | 336.3  |
| 77.5°  | 287.0  | 278.4  | 274.0  | 267.7  | 261.3  |
| 80°    | 214.3  | 212.0  | 207.7  | 201.3  | 197.0  |
| 82.5°  | 145.7  | 145.7  | 143.6  | 135.0  | 135.0  |
| 85°    | 87.7   | 85.7   | 83.6   | 77.0   | 75.0   |
| 87.5°  | 38.6   | 34.3   | 30.0   | 23.7   | 21.4   |
| 90°    | 2.5    | 30.7   | 51.1   | 64.2   | 69.1   |
| 92.5°  | 64.2   | 53.9   | 61.4   | 66.7   | 69.1   |
| 95°    | 166.5  | 81.9   | 99.8   | 112.9  | 110.2  |
| 97.5°  | 299.7  | 89.8   | 130.5  | 138.4  | 140.9  |
| 100°   | 453.7  | 102.6  | 146.1  | 166.5  | 171.6  |
| 102.5° | 622.6  | 617.7  | 151.2  | 179.3  | 187.2  |
| 105°   | 779.0  | 856.0  | 156.5  | 184.4  | 194.8  |
| 107.5° | 961.1  | 1024.9 | 161.6  | 189.6  | 200.0  |
| 110°   | 1135.4 | 1189.0 | 448.6  | 192.3  | 202.3  |

TEST NUMBER: P926467

CATALOG NUMBER: DFN2DIP-TR4F0-060D110US950-FLLONL

**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 1299.4 | 1345.3 | 1301.8 | 197.2  | 205.1  |
| 115°   | 1473.5 | 1517.0 | 1581.3 | 394.7  | 210.3  |
| 117.5° | 1624.8 | 1675.9 | 1719.7 | 1353.0 | 681.6  |
| 120°   | 1793.9 | 1832.3 | 1878.5 | 1909.2 | 1563.2 |
| 122.5° | 1937.3 | 1978.3 | 2029.7 | 2045.0 | 2047.8 |
| 125°   | 2083.3 | 2116.8 | 2165.5 | 2183.4 | 2191.1 |
| 127.5° | 2216.6 | 2252.5 | 2291.1 | 2316.7 | 2319.2 |
| 130°   | 2342.3 | 2383.4 | 2411.3 | 2439.7 | 2437.3 |
| 132.5° | 2470.4 | 2503.9 | 2531.9 | 2555.0 | 2552.6 |
| 135°   | 2578.2 | 2619.2 | 2642.0 | 2668.0 | 2662.7 |
| 137.5° | 2690.8 | 2721.5 | 2747.3 | 2772.9 | 2765.3 |
| 140°   | 2800.9 | 2821.6 | 2849.6 | 2872.7 | 2859.9 |
| 142.5° | 2893.4 | 2911.3 | 2944.5 | 2964.9 | 2952.2 |
| 145°   | 2990.8 | 2988.0 | 3031.5 | 3049.6 | 3036.8 |
| 147.5° | 3075.1 | 3067.5 | 3111.0 | 3123.8 | 3113.8 |
| 150°   | 3157.3 | 3139.3 | 3180.3 | 3195.6 | 3182.8 |
| 152.5° | 3226.3 | 3205.9 | 3244.3 | 3259.8 | 3241.9 |
| 155°   | 3293.0 | 3270.1 | 3300.8 | 3316.1 | 3295.7 |
| 157.5° | 3346.8 | 3326.4 | 3349.6 | 3367.5 | 3346.8 |
| 160°   | 3393.1 | 3377.5 | 3393.1 | 3408.3 | 3390.3 |
| 162.5° | 3433.8 | 3418.7 | 3431.4 | 3449.4 | 3426.3 |
| 165°   | 3469.8 | 3454.5 | 3462.2 | 3480.1 | 3462.2 |
| 167.5° | 3498.0 | 3482.6 | 3490.5 | 3508.4 | 3485.3 |
| 170°   | 3521.2 | 3505.7 | 3510.8 | 3528.8 | 3505.7 |
| 172.5° | 3536.4 | 3521.2 | 3526.4 | 3544.3 | 3521.2 |
| 175°   | 3549.2 | 3531.2 | 3536.4 | 3554.4 | 3528.8 |
| 177.5° | 3554.4 | 3536.4 | 3539.1 | 3557.1 | 3534.0 |
| 180°   | 3541.6 | 3541.6 | 3541.6 | 3541.6 | 3541.6 |

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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 | 7.72             | 8.46  | 8.79  | 9.53  | 11.00 | 7.29           | 8.03  | 8.36  | 9.10  | 10.57 |
|                 | 3H   | 9.37             | 10.03 | 10.45 | 11.12 | 12.60 | 8.90           | 9.56  | 9.98  | 10.64 | 12.13 |
|                 | 4H   | 9.95             | 10.58 | 11.04 | 11.67 | 13.16 | 9.48           | 10.11 | 10.57 | 11.19 | 12.68 |
|                 | 6H   | 10.34            | 10.92 | 11.45 | 12.01 | 13.52 | 9.87           | 10.45 | 10.97 | 11.54 | 13.04 |
|                 | 8H   | 10.44            | 11.00 | 11.55 | 12.10 | 13.60 | 9.97           | 10.52 | 11.08 | 11.63 | 13.12 |
|                 | 12H  | 10.49            | 11.01 | 11.60 | 12.11 | 13.63 | 10.01          | 10.53 | 11.12 | 11.63 | 13.15 |
| 4H              | 2H   | 8.16             | 8.80  | 9.26  | 9.88  | 11.37 | 7.82           | 8.45  | 8.92  | 9.54  | 11.03 |
|                 | 3H   | 10.02            | 10.55 | 11.13 | 11.66 | 13.16 | 9.63           | 10.15 | 10.73 | 11.27 | 12.77 |
|                 | 4H   | 10.73            | 11.21 | 11.84 | 12.31 | 13.84 | 10.32          | 10.81 | 11.43 | 11.91 | 13.43 |
|                 | 6H   | 11.24            | 11.65 | 12.36 | 12.78 | 14.29 | 10.83          | 11.24 | 11.95 | 12.37 | 13.88 |
|                 | 8H   | 11.38            | 11.77 | 12.50 | 12.89 | 14.42 | 10.97          | 11.36 | 12.09 | 12.48 | 14.01 |
|                 | 12H  | 11.45            | 11.80 | 12.59 | 12.93 | 14.47 | 11.03          | 11.38 | 12.16 | 12.51 | 14.05 |
| 8H              | 4H   | 10.92            | 11.30 | 12.03 | 12.42 | 13.95 | 10.56          | 10.94 | 11.67 | 12.06 | 13.59 |
|                 | 6H   | 11.54            | 11.86 | 12.68 | 13.02 | 14.55 | 11.18          | 11.50 | 12.32 | 12.66 | 14.19 |
|                 | 8H   | 11.76            | 12.04 | 12.91 | 13.18 | 14.73 | 11.39          | 11.67 | 12.54 | 12.81 | 14.36 |
|                 | 12H  | 11.89            | 12.13 | 13.04 | 13.27 | 14.85 | 11.50          | 11.75 | 12.65 | 12.88 | 14.47 |
| 12H             | 4H   | 10.90            | 11.25 | 12.03 | 12.38 | 13.91 | 10.54          | 10.89 | 11.68 | 12.02 | 13.56 |
|                 | 6H   | 11.57            | 11.85 | 12.72 | 12.99 | 14.54 | 11.22          | 11.50 | 12.37 | 12.64 | 14.19 |
|                 | 8H   | 11.81            | 12.05 | 12.96 | 13.19 | 14.77 | 11.45          | 11.70 | 12.60 | 12.83 | 14.42 |