

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: P915593

Luminaire Tested: DFN2DIP-TR4F0-070D110US927-RLLONL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P915593  
REPORT IS A COMBINATION OF REPORTS P902022 AND P898849  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-TR4F0-070D110US927-RLLONL  
Description: 4 foot, Triangle Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

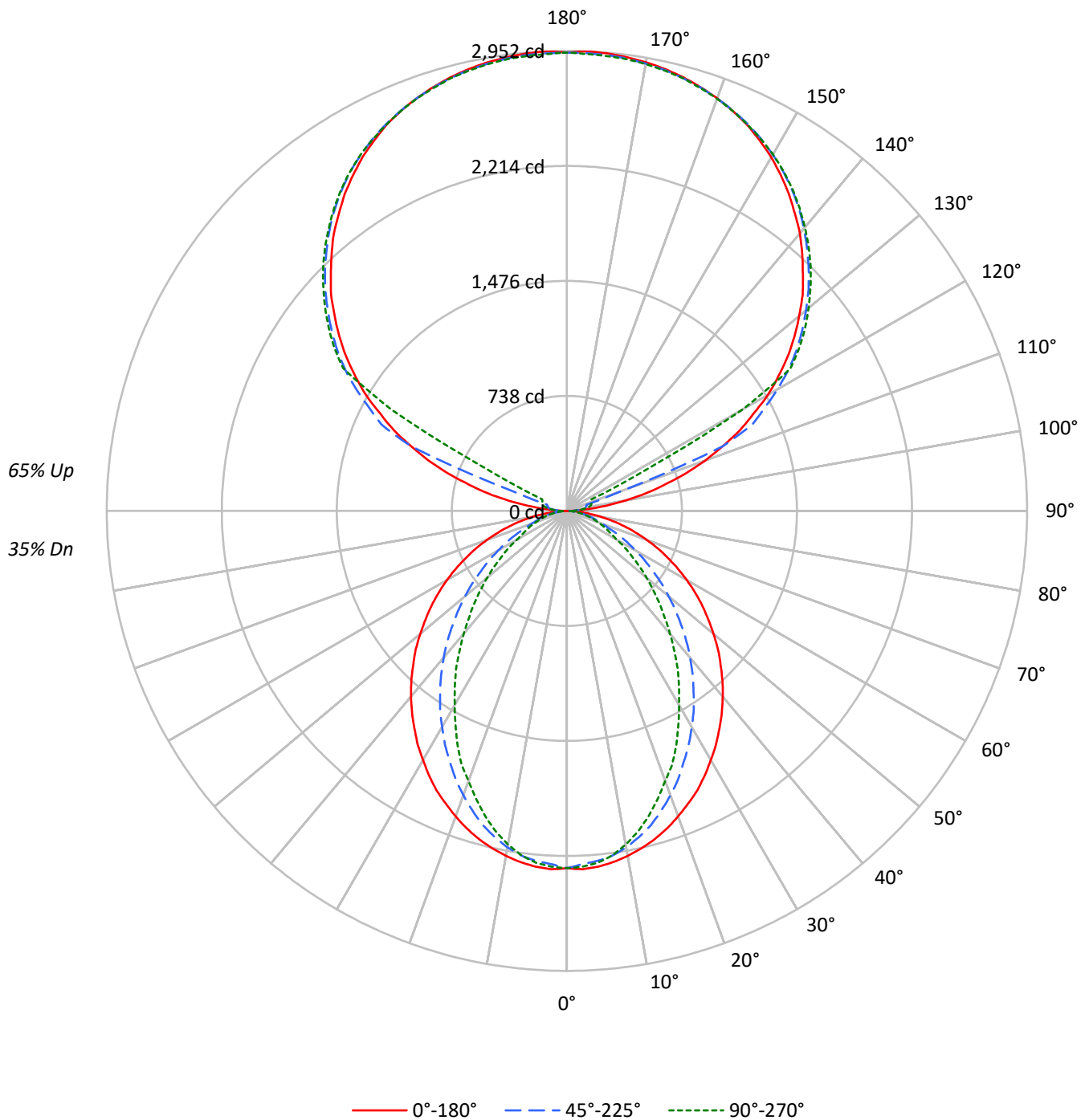
Lumens per Lamp: N/A  
Luminaire Lumens: 13340.3 lumens  
Efficiency: N/A  
Efficacy: 88.8 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 0.99 / 1.16  
Luminous Opening: Rectangular w/ Sides (W: 3.43' x L: 3.96' x H: 0.1')  
CIE Type: Semi-Indirect

Input Watts (W): 150.3  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9977  
Total Harmonic Distortion (THDi): 0.049  
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   | 104 | 104 | 104 | 104 | 94 | 94 | 94 | 94 | 75 | 75 | 75 | 58 | 58 | 58 | 43 | 43 | 43 |
| 1   | 95  | 91  | 87  | 84  | 86 | 82 | 79 | 76 | 66 | 64 | 62 | 52 | 50 | 49 | 38 | 37 | 37 |
| 2   | 87  | 80  | 74  | 69  | 78 | 72 | 67 | 63 | 58 | 55 | 52 | 46 | 44 | 41 | 34 | 33 | 31 |
| 3   | 79  | 70  | 63  | 58  | 71 | 64 | 58 | 53 | 52 | 48 | 44 | 41 | 38 | 35 | 30 | 29 | 27 |
| 4   | 73  | 62  | 55  | 49  | 65 | 57 | 50 | 45 | 46 | 42 | 38 | 36 | 33 | 31 | 27 | 25 | 24 |
| 5   | 67  | 56  | 48  | 42  | 60 | 51 | 44 | 39 | 41 | 37 | 33 | 33 | 29 | 27 | 25 | 23 | 21 |
| 6   | 61  | 50  | 42  | 37  | 55 | 46 | 39 | 34 | 37 | 32 | 29 | 30 | 26 | 24 | 23 | 20 | 18 |
| 7   | 57  | 45  | 37  | 32  | 51 | 41 | 35 | 30 | 34 | 29 | 25 | 27 | 24 | 21 | 21 | 18 | 16 |
| 8   | 53  | 41  | 33  | 28  | 48 | 37 | 31 | 26 | 31 | 26 | 23 | 25 | 21 | 19 | 19 | 17 | 15 |
| 9   | 49  | 37  | 30  | 25  | 44 | 34 | 28 | 24 | 28 | 24 | 20 | 23 | 19 | 17 | 18 | 15 | 13 |
| 10  | 46  | 34  | 27  | 23  | 42 | 31 | 25 | 21 | 26 | 21 | 18 | 21 | 18 | 15 | 16 | 14 | 12 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 1821 | 1821 | 1821 |
| 5°  | 1824 | 1792 | 1803 |
| 10° | 1806 | 1757 | 1745 |
| 15° | 1781 | 1699 | 1654 |
| 20° | 1748 | 1619 | 1542 |
| 25° | 1714 | 1529 | 1435 |
| 30° | 1669 | 1437 | 1299 |
| 35° | 1625 | 1338 | 1179 |
| 40° | 1580 | 1236 | 1041 |
| 45° | 1527 | 1122 | 917  |
| 50° | 1473 | 1007 | 795  |
| 55° | 1417 | 885  | 679  |
| 60° | 1351 | 757  | 558  |
| 65° | 1276 | 627  | 503  |
| 70° | 1185 | 505  | 455  |
| 75° | 1070 | 445  | 414  |
| 80° | 904  | 374  | 358  |
| 85° | 630  | 249  | 269  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 90°

Vertical Angle: 90°

Luminance: 1562 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 214.8   | 1.6       |
| 10°-20°   | 589.7   | 4.4       |
| 20°-30°   | 827.9   | 6.2       |
| 30°-40°   | 902.4   | 6.8       |
| 40°-50°   | 829.4   | 6.2       |
| 50°-60°   | 651.4   | 4.9       |
| 60°-70°   | 424.0   | 3.2       |
| 70°-80°   | 218.2   | 1.6       |
| 80°-90°   | 60.9    | 0.5       |
| 90°-100°  | 97.0    | 0.7       |
| 100°-110° | 361.5   | 2.7       |
| 110°-120° | 958.7   | 7.2       |
| 120°-130° | 1590.2  | 11.9      |
| 130°-140° | 1689.1  | 12.7      |
| 140°-150° | 1569.9  | 11.8      |
| 150°-160° | 1262.1  | 9.5       |
| 160°-170° | 813.3   | 6.1       |
| 170°-180° | 279.9   | 2.1       |
| 0°-30°    | 1632.3  | 12.2      |
| 0°-40°    | 2534.7  | 19.0      |
| 0°-60°    | 4015.5  | 30.1      |
| 0°-90°    | 4718.6  | 35.4      |
| 90°-120°  | 1417.2  | 10.6      |
| 90°-150°  | 6266.3  | 47.0      |
| 90°-180°  | 8622.0  | 64.6      |
| 0°-180°   | 13340.3 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 2292 | 2292  | 2292 | 2292  | 2292 |      |
| 5°   | 2292 | 2282  | 2254 | 2273  | 2267 | 217  |
| 15°  | 2180 | 2157  | 2086 | 2047  | 2026 | 614  |
| 25°  | 1979 | 1912  | 1775 | 1690  | 1659 | 910  |
| 35°  | 1705 | 1599  | 1417 | 1286  | 1240 | 1067 |
| 45°  | 1394 | 1255  | 1037 | 890   | 840  | 1076 |
| 55°  | 1060 | 898   | 674  | 550   | 510  | 947  |
| 65°  | 716  | 548   | 361  | 290   | 284  | 709  |
| 75°  | 382  | 236   | 166  | 151   | 149  | 404  |
| 85°  | 89   | 46    | 39   | 39    | 39   | 102  |
| 90°  | 2    | 26    | 42   | 53    | 57   | 12   |
| 95°  | 138  | 68    | 83   | 94    | 92   | 164  |
| 105° | 647  | 711   | 130  | 153   | 162  | 691  |
| 115° | 1224 | 1260  | 1313 | 328   | 175  | 1205 |
| 125° | 1730 | 1758  | 1798 | 1813  | 1819 | 1543 |
| 135° | 2141 | 2175  | 2194 | 2215  | 2211 | 1654 |
| 145° | 2484 | 2481  | 2517 | 2532  | 2522 | 1553 |
| 155° | 2734 | 2715  | 2741 | 2754  | 2737 | 1260 |
| 165° | 2881 | 2869  | 2875 | 2890  | 2875 | 814  |
| 175° | 2947 | 2932  | 2936 | 2952  | 2930 | 280  |
| 180° | 2941 | 2941  | 2941 | 2941  | 2941 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 2291.9 | 2291.9 | 2291.9 | 2291.9 | 2291.9 |
| 2.5°   | 2302.2 | 2291.9 | 2269.0 | 2289.9 | 2285.7 |
| 5°     | 2291.9 | 2281.5 | 2254.5 | 2273.2 | 2267.0 |
| 7.5°   | 2273.2 | 2260.8 | 2231.8 | 2239.9 | 2229.6 |
| 10°    | 2248.3 | 2233.8 | 2192.4 | 2186.0 | 2173.7 |
| 12.5°  | 2217.2 | 2198.5 | 2142.5 | 2130.1 | 2107.2 |
| 15°    | 2179.8 | 2157.0 | 2086.5 | 2047.2 | 2026.5 |
| 17.5°  | 2136.3 | 2103.1 | 2015.9 | 1970.3 | 1937.1 |
| 20°    | 2086.5 | 2044.9 | 1941.3 | 1889.6 | 1843.8 |
| 22.5°  | 2032.7 | 1984.9 | 1864.5 | 1794.1 | 1763.1 |
| 25°    | 1978.7 | 1912.2 | 1775.4 | 1690.4 | 1659.2 |
| 27.5°  | 1914.5 | 1843.8 | 1692.4 | 1595.0 | 1547.2 |
| 30°    | 1846.0 | 1767.0 | 1601.1 | 1495.5 | 1439.4 |
| 32.5°  | 1779.6 | 1684.1 | 1514.2 | 1389.6 | 1337.7 |
| 35°    | 1704.9 | 1599.1 | 1416.7 | 1286.0 | 1240.2 |
| 37.5°  | 1632.4 | 1518.1 | 1325.4 | 1182.1 | 1130.4 |
| 40°    | 1555.5 | 1431.2 | 1229.9 | 1082.7 | 1028.7 |
| 42.5°  | 1476.8 | 1344.1 | 1134.6 | 981.0  | 929.3  |
| 45°    | 1393.8 | 1254.7 | 1037.1 | 889.7  | 839.9  |
| 47.5°  | 1315.0 | 1167.8 | 943.8  | 796.4  | 750.8  |
| 50°    | 1227.9 | 1080.7 | 852.5  | 709.2  | 665.9  |
| 52.5°  | 1142.7 | 987.1  | 765.3  | 628.4  | 589.1  |
| 55°    | 1059.8 | 898.0  | 674.0  | 549.7  | 510.3  |
| 57.5°  | 974.9  | 808.9  | 593.3  | 477.1  | 443.9  |
| 60°    | 887.7  | 721.8  | 508.1  | 402.5  | 369.2  |
| 62.5°  | 802.7  | 636.8  | 435.5  | 336.0  | 319.5  |
| 65°    | 715.6  | 547.5  | 360.9  | 290.5  | 284.1  |
| 67.5°  | 632.6  | 464.5  | 290.5  | 255.0  | 248.9  |
| 70°    | 545.5  | 383.7  | 240.5  | 219.8  | 211.4  |
| 72.5°  | 462.6  | 309.0  | 201.1  | 184.7  | 180.5  |
| 75°    | 381.6  | 236.3  | 165.9  | 151.4  | 149.4  |
| 77.5°  | 300.8  | 167.9  | 130.7  | 122.3  | 118.2  |
| 80°    | 226.0  | 120.3  | 99.5   | 91.3   | 91.3   |
| 82.5°  | 157.6  | 81.0   | 68.4   | 64.2   | 64.2   |
| 85°    | 89.1   | 45.6   | 39.4   | 39.4   | 39.4   |
| 87.5°  | 33.2   | 16.5   | 16.5   | 14.5   | 14.5   |
| 90°    | 2.1    | 25.5   | 42.5   | 53.3   | 57.4   |
| 92.5°  | 53.3   | 44.8   | 51.0   | 55.4   | 57.4   |
| 95°    | 138.2  | 68.0   | 82.9   | 93.7   | 91.5   |
| 97.5°  | 248.9  | 74.5   | 108.4  | 114.9  | 117.0  |
| 100°   | 376.8  | 85.2   | 121.3  | 138.2  | 142.5  |
| 102.5° | 517.0  | 512.9  | 125.6  | 148.9  | 155.4  |
| 105°   | 646.9  | 710.8  | 129.9  | 153.1  | 161.8  |
| 107.5° | 798.0  | 851.0  | 134.2  | 157.4  | 166.0  |
| 110°   | 942.8  | 987.3  | 372.5  | 159.7  | 168.0  |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 1079.0 | 1117.1 | 1081.0 | 163.7  | 170.3  |
| 115°   | 1223.5 | 1259.6 | 1313.0 | 327.7  | 174.6  |
| 117.5° | 1349.2 | 1391.6 | 1428.0 | 1123.5 | 566.0  |
| 120°   | 1489.6 | 1521.5 | 1559.9 | 1585.4 | 1298.1 |
| 122.5° | 1608.7 | 1642.7 | 1685.4 | 1698.1 | 1700.4 |
| 125°   | 1730.0 | 1757.8 | 1798.2 | 1813.1 | 1819.4 |
| 127.5° | 1840.6 | 1870.4 | 1902.5 | 1923.7 | 1925.8 |
| 130°   | 1945.0 | 1979.1 | 2002.3 | 2025.8 | 2023.9 |
| 132.5° | 2051.4 | 2079.2 | 2102.4 | 2121.6 | 2119.6 |
| 135°   | 2140.9 | 2174.9 | 2193.9 | 2215.4 | 2211.1 |
| 137.5° | 2234.3 | 2259.9 | 2281.3 | 2302.6 | 2296.2 |
| 140°   | 2325.8 | 2343.0 | 2366.2 | 2385.4 | 2374.8 |
| 142.5° | 2402.6 | 2417.5 | 2445.1 | 2462.0 | 2451.4 |
| 145°   | 2483.5 | 2481.2 | 2517.3 | 2532.3 | 2521.7 |
| 147.5° | 2553.5 | 2547.2 | 2583.3 | 2593.9 | 2585.6 |
| 150°   | 2621.7 | 2606.8 | 2640.9 | 2653.6 | 2643.0 |
| 152.5° | 2679.1 | 2662.1 | 2694.0 | 2706.9 | 2692.0 |
| 155°   | 2734.5 | 2715.4 | 2740.9 | 2753.6 | 2736.7 |
| 157.5° | 2779.1 | 2762.2 | 2781.4 | 2796.3 | 2779.1 |
| 160°   | 2817.6 | 2804.6 | 2817.6 | 2830.1 | 2815.3 |
| 162.5° | 2851.4 | 2838.8 | 2849.4 | 2864.3 | 2845.1 |
| 165°   | 2881.2 | 2868.6 | 2874.9 | 2889.8 | 2874.9 |
| 167.5° | 2904.7 | 2891.9 | 2898.4 | 2913.3 | 2894.2 |
| 170°   | 2923.9 | 2911.0 | 2915.3 | 2930.3 | 2911.0 |
| 172.5° | 2936.5 | 2923.9 | 2928.2 | 2943.1 | 2923.9 |
| 175°   | 2947.2 | 2932.3 | 2936.5 | 2951.5 | 2930.3 |
| 177.5° | 2951.5 | 2936.5 | 2938.8 | 2953.7 | 2934.6 |
| 180°   | 2940.9 | 2940.9 | 2940.9 | 2940.9 | 2940.9 |

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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 | 7.68             | 8.41  | 8.76  | 9.48  | 10.95 | 3.66           | 4.38 | 4.73 | 5.45 | 6.92  |
|                 | 3H   | 9.35             | 10.00 | 10.44 | 11.08 | 12.57 | 4.84           | 5.48 | 5.92 | 6.57 | 8.05  |
|                 | 4H   | 9.95             | 10.57 | 11.05 | 11.65 | 13.14 | 5.28           | 5.90 | 6.38 | 6.98 | 8.47  |
|                 | 6H   | 10.37            | 10.93 | 11.48 | 12.02 | 13.53 | 5.60           | 6.16 | 6.71 | 7.25 | 8.76  |
|                 | 8H   | 10.49            | 11.03 | 11.60 | 12.13 | 13.63 | 5.69           | 6.22 | 6.80 | 7.33 | 8.82  |
|                 | 12H  | 10.55            | 11.06 | 11.67 | 12.16 | 13.68 | 5.73           | 6.24 | 6.84 | 7.33 | 8.85  |
| 4H              | 2H   | 7.69             | 8.30  | 8.79  | 9.39  | 10.88 | 4.24           | 4.85 | 5.34 | 5.94 | 7.43  |
|                 | 3H   | 9.51             | 10.02 | 10.62 | 11.13 | 12.63 | 5.58           | 6.09 | 6.69 | 7.20 | 8.71  |
|                 | 4H   | 10.19            | 10.66 | 11.31 | 11.76 | 13.29 | 6.12           | 6.59 | 7.24 | 7.69 | 9.22  |
|                 | 6H   | 10.70            | 11.10 | 11.83 | 12.23 | 13.75 | 6.54           | 6.94 | 7.66 | 8.06 | 9.58  |
|                 | 8H   | 10.88            | 11.25 | 12.00 | 12.37 | 13.90 | 6.66           | 7.04 | 7.79 | 8.16 | 9.69  |
|                 | 12H  | 10.97            | 11.30 | 12.11 | 12.43 | 13.97 | 6.73           | 7.06 | 7.86 | 8.19 | 9.73  |
| 8H              | 4H   | 10.15            | 10.53 | 11.28 | 11.64 | 13.18 | 6.40           | 6.77 | 7.52 | 7.89 | 9.42  |
|                 | 6H   | 10.72            | 11.02 | 11.86 | 12.18 | 13.71 | 6.91           | 7.22 | 8.05 | 8.38 | 9.91  |
|                 | 8H   | 10.93            | 11.20 | 12.08 | 12.34 | 13.89 | 7.10           | 7.37 | 8.25 | 8.51 | 10.06 |
|                 | 12H  | 11.07            | 11.30 | 12.22 | 12.44 | 14.03 | 7.22           | 7.45 | 8.37 | 8.59 | 10.18 |
| 12H             | 4H   | 10.10            | 10.44 | 11.24 | 11.57 | 13.11 | 6.40           | 6.73 | 7.53 | 7.86 | 9.40  |
|                 | 6H   | 10.69            | 10.96 | 11.84 | 12.10 | 13.65 | 6.96           | 7.23 | 8.11 | 8.37 | 9.92  |
|                 | 8H   | 10.91            | 11.14 | 12.06 | 12.28 | 13.87 | 7.17           | 7.40 | 8.32 | 8.54 | 10.13 |