

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: P907455

Luminaire Tested: DFN2DIP-TR4F0-090D050US835-FLLONL

Issue Date: 11/21/2024

**Test Information**

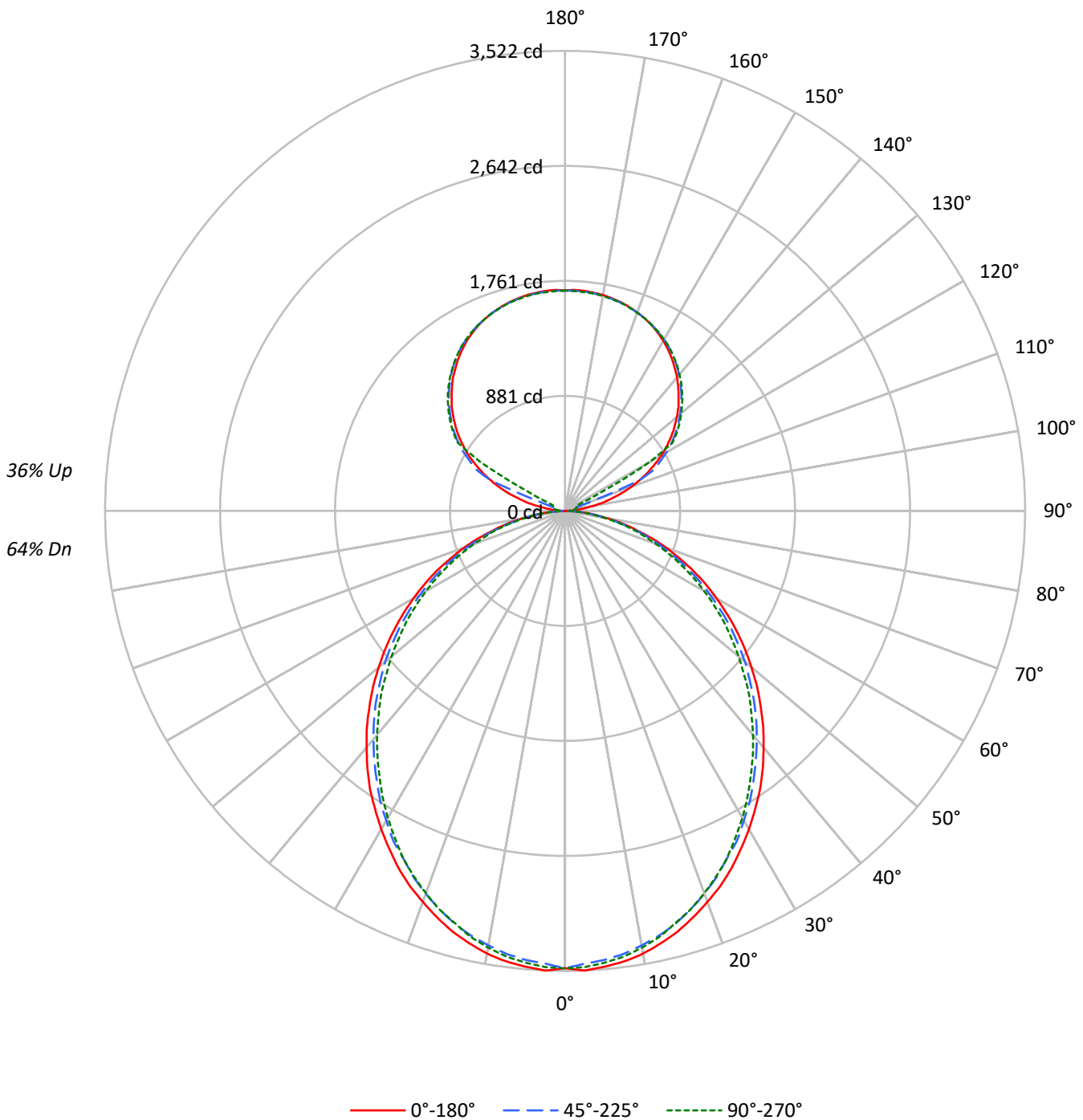
Test Method: LM-79-2019  
Report Number: P907455  
REPORT IS A COMBINATION OF REPORTS P901917 AND P898849  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-TR4F0-090D050US835-FLLONL  
Description: 4 foot, Triangle Define Geo, with Direct Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 13860.0 lumens  
Efficiency: N/A  
Efficacy: 110.6 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-Direct  
  
Input Watts (W): 125.3  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.099  
Total Harmonic Distortion (THDi): 0.979  
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 |    |    | 0  |    |
| RW  | 70  | 50  | 30  | 10  | 70  | 50  | 30  | 10  | 50 | 30 | 10 | 50 | 30 | 10 | 50 | 30 | 10 | 50 | 30 | 10 | 0  |
| RCR |     |     |     |     |     |     |     |     |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 0   | 111 | 111 | 111 | 111 | 104 | 104 | 104 | 104 | 91 | 91 | 91 | 80 | 80 | 80 | 69 | 69 | 69 | 69 | 69 | 69 | 64 |
| 1   | 101 | 97  | 93  | 89  | 95  | 91  | 87  | 84  | 80 | 78 | 75 | 70 | 68 | 67 | 61 | 60 | 59 | 61 | 60 | 59 | 54 |
| 2   | 92  | 84  | 78  | 73  | 86  | 79  | 74  | 69  | 70 | 66 | 62 | 62 | 59 | 56 | 54 | 51 | 49 | 54 | 51 | 49 | 45 |
| 3   | 84  | 74  | 67  | 61  | 79  | 70  | 63  | 58  | 62 | 57 | 52 | 55 | 51 | 47 | 48 | 45 | 42 | 48 | 45 | 42 | 38 |
| 4   | 77  | 66  | 58  | 51  | 72  | 62  | 55  | 49  | 55 | 49 | 45 | 49 | 44 | 40 | 43 | 39 | 36 | 43 | 39 | 36 | 33 |
| 5   | 71  | 59  | 50  | 44  | 66  | 55  | 48  | 42  | 49 | 43 | 39 | 44 | 39 | 35 | 39 | 35 | 32 | 39 | 35 | 32 | 29 |
| 6   | 65  | 53  | 44  | 38  | 61  | 50  | 42  | 37  | 45 | 38 | 34 | 40 | 35 | 31 | 35 | 31 | 28 | 35 | 31 | 28 | 25 |
| 7   | 60  | 48  | 40  | 34  | 57  | 45  | 38  | 33  | 41 | 34 | 30 | 36 | 31 | 27 | 32 | 28 | 25 | 32 | 28 | 25 | 22 |
| 8   | 56  | 43  | 35  | 30  | 53  | 41  | 34  | 29  | 37 | 31 | 27 | 33 | 28 | 24 | 29 | 25 | 22 | 29 | 25 | 22 | 20 |
| 9   | 52  | 40  | 32  | 27  | 49  | 38  | 31  | 26  | 34 | 28 | 24 | 30 | 26 | 22 | 27 | 23 | 20 | 27 | 23 | 20 | 18 |
| 10  | 49  | 37  | 29  | 24  | 46  | 35  | 28  | 23  | 31 | 26 | 22 | 28 | 23 | 20 | 25 | 21 | 18 | 25 | 21 | 18 | 16 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 2782 | 2782 | 2782 |
| 5°  | 2786 | 2743 | 2762 |
| 10° | 2764 | 2706 | 2724 |
| 15° | 2723 | 2662 | 2666 |
| 20° | 2668 | 2600 | 2606 |
| 25° | 2614 | 2526 | 2537 |
| 30° | 2545 | 2457 | 2449 |
| 35° | 2481 | 2376 | 2355 |
| 40° | 2401 | 2293 | 2267 |
| 45° | 2321 | 2211 | 2176 |
| 50° | 2234 | 2125 | 2071 |
| 55° | 2143 | 2025 | 1975 |
| 60° | 2040 | 1906 | 1864 |
| 65° | 1928 | 1783 | 1734 |
| 70° | 1785 | 1634 | 1593 |
| 75° | 1586 | 1455 | 1464 |
| 80° | 1348 | 1226 | 1216 |
| 85° | 975  | 832  | 806  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°  
 Vertical Angle: 45°  
 Luminance: 2321 cd/sqm



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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 329.6   | 2.4       |
| 10°-20°   | 927.4   | 6.7       |
| 20°-30°   | 1362.9  | 9.8       |
| 30°-40°   | 1582.9  | 11.4      |
| 40°-50°   | 1580.9  | 11.4      |
| 50°-60°   | 1378.5  | 9.9       |
| 60°-70°   | 1019.0  | 7.4       |
| 70°-80°   | 576.6   | 4.2       |
| 80°-90°   | 155.1   | 1.1       |
| 90°-100°  | 55.7    | 0.4       |
| 100°-110° | 207.4   | 1.5       |
| 110°-120° | 550.1   | 4.0       |
| 120°-130° | 912.4   | 6.6       |
| 130°-140° | 969.2   | 7.0       |
| 140°-150° | 900.8   | 6.5       |
| 150°-160° | 724.2   | 5.2       |
| 160°-170° | 466.6   | 3.4       |
| 170°-180° | 160.6   | 1.2       |
| 0°-30°    | 2619.9  | 18.9      |
| 0°-40°    | 4202.8  | 30.3      |
| 0°-60°    | 7162.3  | 51.7      |
| 0°-90°    | 8913.0  | 64.3      |
| 90°-120°  | 813.2   | 5.9       |
| 90°-150°  | 3595.6  | 25.9      |
| 90°-180°  | 4947.0  | 35.7      |
| 0°-180°   | 13860.0 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 3502 | 3502  | 3502 | 3502  | 3502 |      |
| 5°   | 3502 | 3489  | 3452 | 3478  | 3472 | 332  |
| 15°  | 3334 | 3314  | 3270 | 3283  | 3266 | 939  |
| 25°  | 3017 | 2990  | 2933 | 2940  | 2933 | 1388 |
| 35°  | 2603 | 2570  | 2516 | 2495  | 2478 | 1626 |
| 45°  | 2118 | 2095  | 2044 | 2007  | 1994 | 1635 |
| 55°  | 1603 | 1583  | 1542 | 1502  | 1485 | 1433 |
| 65°  | 1081 | 1061  | 1027 | 997   | 980  | 1069 |
| 75°  | 566  | 559   | 542  | 522   | 529  | 604  |
| 85°  | 138  | 135   | 132  | 121   | 118  | 154  |
| 90°  | 1    | 15    | 24   | 31    | 33   | 13   |
| 95°  | 79   | 39    | 48   | 54    | 52   | 94   |
| 105° | 371  | 408   | 74   | 88    | 93   | 397  |
| 115° | 702  | 723   | 753  | 188   | 100  | 691  |
| 125° | 993  | 1009  | 1032 | 1040  | 1044 | 885  |
| 135° | 1228 | 1248  | 1259 | 1271  | 1269 | 949  |
| 145° | 1425 | 1424  | 1444 | 1453  | 1447 | 891  |
| 155° | 1569 | 1558  | 1573 | 1580  | 1570 | 723  |
| 165° | 1653 | 1646  | 1650 | 1658  | 1650 | 467  |
| 175° | 1691 | 1682  | 1685 | 1694  | 1681 | 161  |
| 180° | 1687 | 1687  | 1687 | 1687  | 1687 |      |



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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 3501.9 | 3501.9 | 3501.9 | 3501.9 | 3501.9 |
| 2.5°   | 3522.3 | 3505.5 | 3468.4 | 3501.9 | 3495.5 |
| 5°     | 3501.9 | 3488.7 | 3451.6 | 3478.4 | 3471.9 |
| 7.5°   | 3478.4 | 3458.4 | 3421.2 | 3448.4 | 3441.6 |
| 10°    | 3441.6 | 3418.0 | 3377.6 | 3404.4 | 3394.4 |
| 12.5°  | 3390.8 | 3370.8 | 3330.5 | 3347.2 | 3340.5 |
| 15°    | 3333.7 | 3313.7 | 3269.7 | 3283.3 | 3266.5 |
| 17.5°  | 3262.9 | 3242.9 | 3199.0 | 3215.8 | 3199.0 |
| 20°    | 3185.4 | 3165.4 | 3118.2 | 3128.2 | 3115.0 |
| 22.5°  | 3108.2 | 3077.9 | 3033.9 | 3033.9 | 3027.1 |
| 25°    | 3017.1 | 2990.3 | 2933.2 | 2939.6 | 2933.2 |
| 27.5°  | 2916.0 | 2892.4 | 2848.9 | 2838.9 | 2822.1 |
| 30°    | 2815.3 | 2788.1 | 2737.7 | 2727.7 | 2714.2 |
| 32.5°  | 2707.4 | 2687.4 | 2633.4 | 2613.1 | 2599.5 |
| 35°    | 2603.1 | 2569.5 | 2515.5 | 2495.2 | 2478.4 |
| 37.5°  | 2485.2 | 2454.8 | 2400.8 | 2377.3 | 2360.5 |
| 40°    | 2364.0 | 2336.9 | 2282.9 | 2252.9 | 2239.4 |
| 42.5°  | 2246.1 | 2219.0 | 2165.4 | 2131.5 | 2111.5 |
| 45°    | 2118.2 | 2094.7 | 2043.9 | 2007.1 | 1993.6 |
| 47.5°  | 1993.6 | 1970.0 | 1916.0 | 1878.9 | 1858.9 |
| 50°    | 1862.1 | 1845.3 | 1798.1 | 1751.0 | 1734.2 |
| 52.5°  | 1734.2 | 1710.6 | 1667.0 | 1629.9 | 1606.3 |
| 55°    | 1603.1 | 1582.7 | 1542.3 | 1502.0 | 1485.2 |
| 57.5°  | 1471.6 | 1454.8 | 1410.9 | 1370.5 | 1356.9 |
| 60°    | 1340.1 | 1326.9 | 1279.7 | 1242.6 | 1232.6 |
| 62.5°  | 1212.2 | 1188.6 | 1155.0 | 1121.5 | 1107.9 |
| 65°    | 1081.1 | 1060.7 | 1027.1 | 996.8  | 980.0  |
| 67.5°  | 946.4  | 929.3  | 899.2  | 875.7  | 862.1  |
| 70°    | 821.7  | 808.1  | 777.8  | 754.2  | 741.0  |
| 72.5°  | 693.8  | 680.2  | 663.4  | 639.9  | 629.9  |
| 75°    | 565.6  | 559.1  | 542.0  | 522.0  | 528.8  |
| 77.5°  | 451.2  | 437.7  | 430.9  | 420.9  | 410.9  |
| 80°    | 336.9  | 333.3  | 326.5  | 316.5  | 309.8  |
| 82.5°  | 229.0  | 229.0  | 225.8  | 212.2  | 212.2  |
| 85°    | 137.9  | 134.7  | 131.5  | 121.1  | 117.9  |
| 87.5°  | 60.7   | 53.9   | 47.2   | 37.2   | 33.6   |
| 90°    | 1.2    | 14.6   | 24.4   | 30.6   | 32.9   |
| 92.5°  | 30.6   | 25.7   | 29.3   | 31.8   | 32.9   |
| 95°    | 79.3   | 39.0   | 47.6   | 53.8   | 52.5   |
| 97.5°  | 142.8  | 42.8   | 62.2   | 66.0   | 67.1   |
| 100°   | 216.2  | 48.9   | 69.6   | 79.3   | 81.8   |
| 102.5° | 296.7  | 294.3  | 72.1   | 85.4   | 89.2   |
| 105°   | 371.2  | 407.9  | 74.5   | 87.9   | 92.8   |
| 107.5° | 457.9  | 488.3  | 77.0   | 90.3   | 95.3   |
| 110°   | 541.0  | 566.5  | 213.7  | 91.6   | 96.4   |



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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 619.1  | 641.0  | 620.3  | 94.0   | 97.7   |
| 115°   | 702.1  | 722.8  | 753.4  | 188.1  | 100.2  |
| 117.5° | 774.1  | 798.5  | 819.4  | 644.6  | 324.8  |
| 120°   | 854.7  | 873.0  | 895.0  | 909.7  | 744.8  |
| 122.5° | 923.0  | 942.6  | 967.1  | 974.4  | 975.7  |
| 125°   | 992.6  | 1008.6 | 1031.8 | 1040.3 | 1044.0 |
| 127.5° | 1056.1 | 1073.2 | 1091.7 | 1103.8 | 1105.0 |
| 130°   | 1116.0 | 1135.6 | 1148.9 | 1162.4 | 1161.3 |
| 132.5° | 1177.1 | 1193.0 | 1206.3 | 1217.4 | 1216.2 |
| 135°   | 1228.4 | 1248.0 | 1258.8 | 1271.2 | 1268.7 |
| 137.5° | 1282.0 | 1296.7 | 1309.0 | 1321.2 | 1317.6 |
| 140°   | 1334.5 | 1344.4 | 1357.7 | 1368.7 | 1362.7 |
| 142.5° | 1378.6 | 1387.2 | 1403.0 | 1412.7 | 1406.6 |
| 145°   | 1425.0 | 1423.7 | 1444.4 | 1453.0 | 1446.9 |
| 147.5° | 1465.2 | 1461.5 | 1482.3 | 1488.4 | 1483.6 |
| 150°   | 1504.3 | 1495.8 | 1515.3 | 1522.6 | 1516.5 |
| 152.5° | 1537.2 | 1527.5 | 1545.8 | 1553.2 | 1544.6 |
| 155°   | 1569.0 | 1558.1 | 1572.7 | 1580.0 | 1570.3 |
| 157.5° | 1594.6 | 1584.9 | 1595.9 | 1604.5 | 1594.6 |
| 160°   | 1616.7 | 1609.3 | 1616.7 | 1623.9 | 1615.4 |
| 162.5° | 1636.1 | 1628.9 | 1634.9 | 1643.5 | 1632.5 |
| 165°   | 1653.2 | 1646.0 | 1649.6 | 1658.1 | 1649.6 |
| 167.5° | 1666.7 | 1659.3 | 1663.1 | 1671.6 | 1660.6 |
| 170°   | 1677.7 | 1670.3 | 1672.8 | 1681.3 | 1670.3 |
| 172.5° | 1685.0 | 1677.7 | 1680.2 | 1688.7 | 1677.7 |
| 175°   | 1691.1 | 1682.5 | 1685.0 | 1693.5 | 1681.3 |
| 177.5° | 1693.5 | 1685.0 | 1686.3 | 1694.8 | 1683.8 |
| 180°   | 1687.4 | 1687.4 | 1687.4 | 1687.4 | 1687.4 |



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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            | 13.05 | 12.87 | 13.90 | 14.95 | 11.62          | 12.62 | 12.44 | 13.47 | 14.52 |
|                 | 3H   | 13.72            | 14.62 | 14.55 | 15.48 | 16.56 | 13.24          | 14.15 | 14.08 | 15.00 | 16.08 |
|                 | 4H   | 14.31            | 15.17 | 15.16 | 16.03 | 17.12 | 13.84          | 14.69 | 14.69 | 15.56 | 16.64 |
|                 | 6H   | 14.72            | 15.51 | 15.58 | 16.38 | 17.48 | 14.24          | 15.03 | 15.11 | 15.90 | 17.00 |
|                 | 8H   | 14.83            | 15.58 | 15.70 | 16.47 | 17.57 | 14.35          | 15.10 | 15.23 | 15.99 | 17.09 |
|                 | 12H  | 14.88            | 15.60 | 15.76 | 16.48 | 17.61 | 14.40          | 15.12 | 15.28 | 16.00 | 17.13 |
| 4H              | 2H   | 12.53            | 13.38 | 13.38 | 14.24 | 15.33 | 12.18          | 13.03 | 13.04 | 13.90 | 14.99 |
|                 | 3H   | 14.40            | 15.12 | 15.27 | 16.01 | 17.12 | 14.01          | 14.72 | 14.88 | 15.62 | 16.73 |
|                 | 4H   | 15.12            | 15.77 | 16.01 | 16.67 | 17.80 | 14.72          | 15.37 | 15.60 | 16.26 | 17.39 |
|                 | 6H   | 15.65            | 16.21 | 16.54 | 17.13 | 18.26 | 15.24          | 15.80 | 16.14 | 16.72 | 17.85 |
|                 | 8H   | 15.80            | 16.33 | 16.70 | 17.24 | 18.38 | 15.39          | 15.91 | 16.29 | 16.82 | 17.97 |
|                 | 12H  | 15.88            | 16.35 | 16.80 | 17.28 | 18.44 | 15.46          | 15.93 | 16.38 | 16.86 | 18.01 |
| 8H              | 4H   | 15.33            | 15.86 | 16.23 | 16.77 | 17.92 | 14.97          | 15.50 | 15.87 | 16.41 | 17.56 |
|                 | 6H   | 15.97            | 16.40 | 16.90 | 17.36 | 18.50 | 15.61          | 16.04 | 16.53 | 16.99 | 18.14 |
|                 | 8H   | 16.19            | 16.58 | 17.13 | 17.52 | 18.69 | 15.82          | 16.21 | 16.76 | 17.15 | 18.32 |
|                 | 12H  | 16.33            | 16.67 | 17.27 | 17.61 | 18.82 | 15.95          | 16.29 | 16.89 | 17.22 | 18.44 |
| 12H             | 4H   | 15.33            | 15.80 | 16.24 | 16.73 | 17.88 | 14.97          | 15.45 | 15.89 | 16.38 | 17.53 |
|                 | 6H   | 16.00            | 16.39 | 16.94 | 17.33 | 18.50 | 15.65          | 16.04 | 16.59 | 16.98 | 18.14 |
|                 | 8H   | 16.25            | 16.59 | 17.19 | 17.53 | 18.74 | 15.89          | 16.23 | 16.83 | 17.17 | 18.38 |