

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: P923789

Luminaire Tested: DFN2DIP-TR4F0-080D050US940-RLLONL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P923789  
REPORT IS A COMBINATION OF REPORTS P901916 AND P898849  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-TR4F0-080D050US940-RLLONL  
Description: 4 foot, Triangle Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

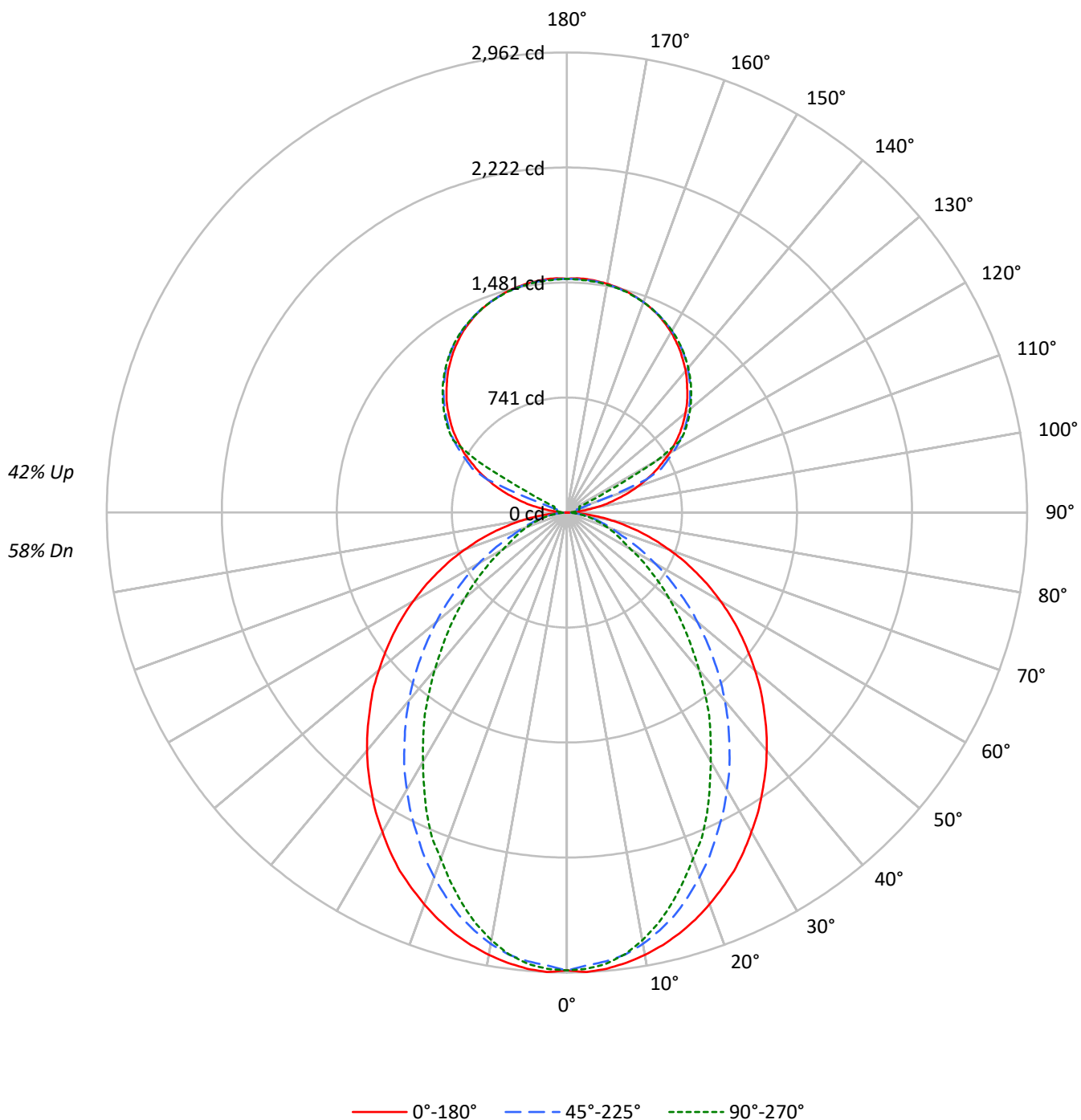
**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 10477.6 lumens  
Efficiency: N/A  
Efficacy: 92.8 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: General Diffuse  
  
Input Watts (W): 112.9  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9957  
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   | 109 | 109 | 109 | 109 | 102 | 102 | 102 | 102 | 88 | 88 | 88 | 75 | 75 | 75 | 63 | 63 | 63 |
| 1   | 100 | 96  | 92  | 89  | 93  | 90  | 86  | 83  | 78 | 75 | 73 | 67 | 65 | 64 | 57 | 56 | 55 |
| 2   | 92  | 84  | 79  | 74  | 85  | 79  | 74  | 69  | 69 | 65 | 62 | 59 | 57 | 54 | 51 | 49 | 47 |
| 3   | 84  | 75  | 68  | 62  | 78  | 70  | 64  | 59  | 61 | 56 | 52 | 53 | 49 | 46 | 45 | 43 | 41 |
| 4   | 77  | 67  | 59  | 53  | 72  | 62  | 56  | 50  | 55 | 49 | 45 | 48 | 44 | 40 | 41 | 38 | 35 |
| 5   | 71  | 60  | 52  | 46  | 66  | 56  | 49  | 44  | 49 | 44 | 39 | 43 | 39 | 35 | 37 | 34 | 31 |
| 6   | 66  | 54  | 46  | 40  | 61  | 51  | 43  | 38  | 45 | 39 | 35 | 39 | 35 | 31 | 34 | 31 | 28 |
| 7   | 61  | 49  | 41  | 35  | 57  | 46  | 39  | 34  | 41 | 35 | 31 | 36 | 31 | 28 | 31 | 28 | 25 |
| 8   | 57  | 44  | 37  | 32  | 53  | 42  | 35  | 30  | 37 | 32 | 28 | 33 | 28 | 25 | 29 | 25 | 23 |
| 9   | 53  | 41  | 33  | 28  | 49  | 39  | 32  | 27  | 34 | 29 | 25 | 30 | 26 | 23 | 27 | 23 | 20 |
| 10  | 49  | 38  | 30  | 26  | 46  | 36  | 29  | 25  | 32 | 26 | 23 | 28 | 24 | 21 | 25 | 21 | 19 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 2342 | 2342 | 2342 |
| 5°  | 2346 | 2305 | 2320 |
| 10° | 2323 | 2260 | 2244 |
| 15° | 2291 | 2185 | 2127 |
| 20° | 2249 | 2082 | 1984 |
| 25° | 2205 | 1967 | 1846 |
| 30° | 2147 | 1848 | 1670 |
| 35° | 2090 | 1721 | 1516 |
| 40° | 2032 | 1589 | 1340 |
| 45° | 1965 | 1443 | 1180 |
| 50° | 1895 | 1296 | 1023 |
| 55° | 1822 | 1138 | 873  |
| 60° | 1738 | 974  | 718  |
| 65° | 1642 | 806  | 646  |
| 70° | 1524 | 650  | 585  |
| 75° | 1377 | 573  | 532  |
| 80° | 1163 | 481  | 461  |
| 85° | 811  | 320  | 346  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 1965 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 276.3   | 2.6       |
| 10°-20°   | 758.6   | 7.2       |
| 20°-30°   | 1065.0  | 10.2      |
| 30°-40°   | 1160.9  | 11.1      |
| 40°-50°   | 1067.0  | 10.2      |
| 50°-60°   | 838.0   | 8.0       |
| 60°-70°   | 545.4   | 5.2       |
| 70°-80°   | 280.8   | 2.7       |
| 80°-90°   | 74.3    | 0.7       |
| 90°-100°  | 49.6    | 0.5       |
| 100°-110° | 185.0   | 1.8       |
| 110°-120° | 490.6   | 4.7       |
| 120°-130° | 813.6   | 7.8       |
| 130°-140° | 864.3   | 8.2       |
| 140°-150° | 803.2   | 7.7       |
| 150°-160° | 645.8   | 6.2       |
| 160°-170° | 416.1   | 4.0       |
| 170°-180° | 143.2   | 1.4       |
| 0°-30°    | 2099.9  | 20.0      |
| 0°-40°    | 3260.8  | 31.1      |
| 0°-60°    | 5165.8  | 49.3      |
| 0°-90°    | 6066.3  | 57.9      |
| 90°-120°  | 725.2   | 6.9       |
| 90°-150°  | 3206.2  | 30.6      |
| 90°-180°  | 4411.0  | 42.1      |
| 0°-180°   | 10477.6 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 2948 | 2948  | 2948 | 2948  | 2948 |      |
| 5°   | 2948 | 2935  | 2900 | 2924  | 2916 | 280  |
| 15°  | 2804 | 2775  | 2684 | 2634  | 2607 | 790  |
| 25°  | 2546 | 2460  | 2284 | 2175  | 2134 | 1171 |
| 35°  | 2193 | 2057  | 1822 | 1654  | 1595 | 1373 |
| 45°  | 1793 | 1614  | 1334 | 1144  | 1081 | 1385 |
| 55°  | 1363 | 1155  | 867  | 707   | 656  | 1218 |
| 65°  | 921  | 704   | 464  | 374   | 365  | 913  |
| 75°  | 491  | 304   | 214  | 195   | 192  | 519  |
| 85°  | 115  | 59    | 51   | 51    | 51   | 132  |
| 90°  | 1    | 13    | 22   | 27    | 29   | 10   |
| 95°  | 71   | 35    | 42   | 48    | 47   | 84   |
| 105° | 331  | 364   | 66   | 78    | 83   | 354  |
| 115° | 626  | 644   | 672  | 168   | 89   | 616  |
| 125° | 885  | 899   | 920  | 928   | 931  | 789  |
| 135° | 1095 | 1113  | 1122 | 1134  | 1131 | 846  |
| 145° | 1271 | 1270  | 1288 | 1296  | 1290 | 795  |
| 155° | 1399 | 1389  | 1402 | 1409  | 1400 | 645  |
| 165° | 1474 | 1468  | 1471 | 1478  | 1471 | 416  |
| 175° | 1508 | 1500  | 1502 | 1510  | 1499 | 144  |
| 180° | 1505 | 1505  | 1505 | 1505  | 1505 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 2948.4 | 2948.4 | 2948.4 | 2948.4 | 2948.4 |
| 2.5°   | 2961.6 | 2948.4 | 2918.9 | 2945.8 | 2940.4 |
| 5°     | 2948.4 | 2935.1 | 2900.2 | 2924.3 | 2916.3 |
| 7.5°   | 2924.3 | 2908.4 | 2871.0 | 2881.6 | 2868.2 |
| 10°    | 2892.3 | 2873.6 | 2820.4 | 2812.2 | 2796.3 |
| 12.5°  | 2852.4 | 2828.3 | 2756.1 | 2740.2 | 2710.8 |
| 15°    | 2804.3 | 2774.8 | 2684.2 | 2633.6 | 2606.9 |
| 17.5°  | 2748.2 | 2705.4 | 2593.4 | 2534.8 | 2492.0 |
| 20°    | 2684.2 | 2630.7 | 2497.4 | 2430.9 | 2371.9 |
| 22.5°  | 2614.9 | 2553.4 | 2398.6 | 2308.0 | 2268.1 |
| 25°    | 2545.5 | 2460.1 | 2283.9 | 2174.7 | 2134.5 |
| 27.5°  | 2462.8 | 2371.9 | 2177.2 | 2051.8 | 1990.4 |
| 30°    | 2374.8 | 2273.1 | 2059.8 | 1923.9 | 1851.6 |
| 32.5°  | 2289.3 | 2166.5 | 1947.9 | 1787.7 | 1720.9 |
| 35°    | 2193.3 | 2057.2 | 1822.5 | 1654.4 | 1595.4 |
| 37.5°  | 2099.9 | 1953.0 | 1705.0 | 1520.7 | 1454.2 |
| 40°    | 2001.2 | 1841.2 | 1582.2 | 1392.8 | 1323.4 |
| 42.5°  | 1899.8 | 1729.1 | 1459.6 | 1262.0 | 1195.4 |
| 45°    | 1793.1 | 1614.2 | 1334.2 | 1144.5 | 1080.6 |
| 47.5°  | 1691.8 | 1502.4 | 1214.2 | 1024.5 | 965.9  |
| 50°    | 1579.6 | 1390.3 | 1096.7 | 912.4  | 856.6  |
| 52.5°  | 1470.1 | 1269.9 | 984.5  | 808.5  | 757.9  |
| 55°    | 1363.3 | 1155.3 | 867.1  | 707.1  | 656.5  |
| 57.5°  | 1254.1 | 1040.6 | 763.2  | 613.8  | 571.0  |
| 60°    | 1141.9 | 928.5  | 653.6  | 517.7  | 475.0  |
| 62.5°  | 1032.7 | 819.2  | 560.3  | 432.3  | 411.1  |
| 65°    | 920.6  | 704.3  | 464.2  | 373.7  | 365.4  |
| 67.5°  | 813.9  | 597.6  | 373.7  | 328.1  | 320.2  |
| 70°    | 701.8  | 493.7  | 309.4  | 282.8  | 272.1  |
| 72.5°  | 595.0  | 397.4  | 258.8  | 237.6  | 232.1  |
| 75°    | 490.9  | 304.1  | 213.5  | 194.7  | 192.3  |
| 77.5°  | 387.0  | 216.0  | 168.2  | 157.4  | 152.0  |
| 80°    | 290.7  | 154.9  | 128.0  | 117.4  | 117.4  |
| 82.5°  | 202.7  | 104.2  | 88.0   | 82.7   | 82.7   |
| 85°    | 114.7  | 58.6   | 50.6   | 50.6   | 50.6   |
| 87.5°  | 42.7   | 21.2   | 21.2   | 18.7   | 18.7   |
| 90°    | 1.1    | 13.0   | 21.8   | 27.3   | 29.3   |
| 92.5°  | 27.3   | 22.9   | 26.1   | 28.4   | 29.3   |
| 95°    | 70.7   | 34.8   | 42.4   | 48.0   | 46.8   |
| 97.5°  | 127.3  | 38.2   | 55.5   | 58.9   | 59.8   |
| 100°   | 192.8  | 43.6   | 62.1   | 70.7   | 72.9   |
| 102.5° | 264.6  | 262.4  | 64.3   | 76.2   | 79.5   |
| 105°   | 331.0  | 363.7  | 66.4   | 78.4   | 82.8   |
| 107.5° | 408.3  | 435.4  | 68.7   | 80.5   | 85.0   |
| 110°   | 482.4  | 505.2  | 190.6  | 81.7   | 86.0   |



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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 552.1  | 571.6  | 553.1  | 83.8   | 87.1   |
| 115°   | 626.1  | 644.5  | 671.8  | 167.7  | 89.3   |
| 117.5° | 690.3  | 712.0  | 730.7  | 574.8  | 289.6  |
| 120°   | 762.1  | 778.5  | 798.1  | 811.2  | 664.1  |
| 122.5° | 823.0  | 840.5  | 862.4  | 868.9  | 870.0  |
| 125°   | 885.1  | 899.4  | 920.1  | 927.6  | 930.9  |
| 127.5° | 941.7  | 957.0  | 973.5  | 984.3  | 985.3  |
| 130°   | 995.1  | 1012.6 | 1024.5 | 1036.5 | 1035.5 |
| 132.5° | 1049.6 | 1063.8 | 1075.7 | 1085.6 | 1084.5 |
| 135°   | 1095.4 | 1112.9 | 1122.5 | 1133.5 | 1131.3 |
| 137.5° | 1143.2 | 1156.3 | 1167.2 | 1178.1 | 1174.9 |
| 140°   | 1190.0 | 1198.8 | 1210.7 | 1220.5 | 1215.1 |
| 142.5° | 1229.3 | 1237.0 | 1251.1 | 1259.7 | 1254.3 |
| 145°   | 1270.7 | 1269.5 | 1288.0 | 1295.7 | 1290.2 |
| 147.5° | 1306.5 | 1303.2 | 1321.8 | 1327.2 | 1322.9 |
| 150°   | 1341.4 | 1333.8 | 1351.2 | 1357.7 | 1352.3 |
| 152.5° | 1370.7 | 1362.1 | 1378.4 | 1385.0 | 1377.3 |
| 155°   | 1399.1 | 1389.4 | 1402.4 | 1408.9 | 1400.3 |
| 157.5° | 1421.9 | 1413.3 | 1423.1 | 1430.7 | 1421.9 |
| 160°   | 1441.6 | 1435.0 | 1441.6 | 1448.0 | 1440.5 |
| 162.5° | 1458.9 | 1452.5 | 1457.9 | 1465.5 | 1455.7 |
| 165°   | 1474.2 | 1467.8 | 1471.0 | 1478.5 | 1471.0 |
| 167.5° | 1486.2 | 1479.6 | 1483.0 | 1490.6 | 1480.8 |
| 170°   | 1496.0 | 1489.4 | 1491.7 | 1499.2 | 1489.4 |
| 172.5° | 1502.5 | 1496.0 | 1498.3 | 1505.8 | 1496.0 |
| 175°   | 1508.0 | 1500.3 | 1502.5 | 1510.1 | 1499.2 |
| 177.5° | 1510.1 | 1502.5 | 1503.7 | 1511.3 | 1501.5 |
| 180°   | 1504.7 | 1504.7 | 1504.7 | 1504.7 | 1504.7 |

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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 | 10.81            | 11.71 | 11.70 | 12.61 | 13.77 | 6.78           | 7.68  | 7.67  | 8.59  | 9.74  |
|                 | 3H   | 12.49            | 13.29 | 13.39 | 14.21 | 15.39 | 7.98           | 8.78  | 8.88  | 9.70  | 10.88 |
|                 | 4H   | 13.10            | 13.86 | 14.02 | 14.78 | 15.97 | 8.43           | 9.19  | 9.35  | 10.11 | 11.30 |
|                 | 6H   | 13.53            | 14.22 | 14.46 | 15.15 | 16.36 | 8.75           | 9.45  | 9.69  | 10.38 | 11.59 |
|                 | 8H   | 13.65            | 14.32 | 14.59 | 15.26 | 16.47 | 8.85           | 9.51  | 9.79  | 10.46 | 11.66 |
|                 | 12H  | 13.72            | 14.35 | 14.66 | 15.29 | 16.52 | 8.89           | 9.53  | 9.84  | 10.47 | 11.69 |
| 4H              | 2H   | 10.83            | 11.59 | 11.76 | 12.52 | 13.71 | 7.38           | 8.14  | 8.31  | 9.07  | 10.26 |
|                 | 3H   | 12.67            | 13.30 | 13.60 | 14.25 | 15.46 | 8.74           | 9.37  | 9.68  | 10.33 | 11.53 |
|                 | 4H   | 13.36            | 13.94 | 14.31 | 14.89 | 16.12 | 9.29           | 9.87  | 10.24 | 10.82 | 12.05 |
|                 | 6H   | 13.88            | 14.38 | 14.84 | 15.35 | 16.58 | 9.72           | 10.21 | 10.68 | 11.18 | 12.41 |
|                 | 8H   | 14.06            | 14.52 | 15.02 | 15.49 | 16.73 | 9.85           | 10.31 | 10.81 | 11.28 | 12.52 |
|                 | 12H  | 14.16            | 14.57 | 15.14 | 15.56 | 16.81 | 9.92           | 10.33 | 10.90 | 11.32 | 12.56 |
| 8H              | 4H   | 13.34            | 13.80 | 14.30 | 14.76 | 16.01 | 9.58           | 10.04 | 10.54 | 11.01 | 12.25 |
|                 | 6H   | 13.90            | 14.29 | 14.89 | 15.29 | 16.54 | 10.10          | 10.48 | 11.09 | 11.49 | 12.73 |
|                 | 8H   | 14.12            | 14.46 | 15.12 | 15.46 | 16.72 | 10.29          | 10.63 | 11.29 | 11.63 | 12.89 |
|                 | 12H  | 14.26            | 14.56 | 15.26 | 15.55 | 16.86 | 10.41          | 10.71 | 11.41 | 11.70 | 13.01 |
| 12H             | 4H   | 13.29            | 13.71 | 14.27 | 14.69 | 15.94 | 9.59           | 10.00 | 10.57 | 10.99 | 12.23 |
|                 | 6H   | 13.88            | 14.22 | 14.88 | 15.21 | 16.48 | 10.15          | 10.49 | 11.14 | 11.48 | 12.74 |
|                 | 8H   | 14.10            | 14.40 | 15.10 | 15.39 | 16.70 | 10.36          | 10.66 | 11.36 | 11.65 | 12.96 |