

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: P922134

Luminaire Tested: DFN2DIP-PN3F0-060D040US940-RLLFLL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P922134  
REPORT IS A COMBINATION OF REPORTS P899532 AND P896399  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-PN3F0-060D040US940-RLLFLL  
Description: 3 foot, Pentagon Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

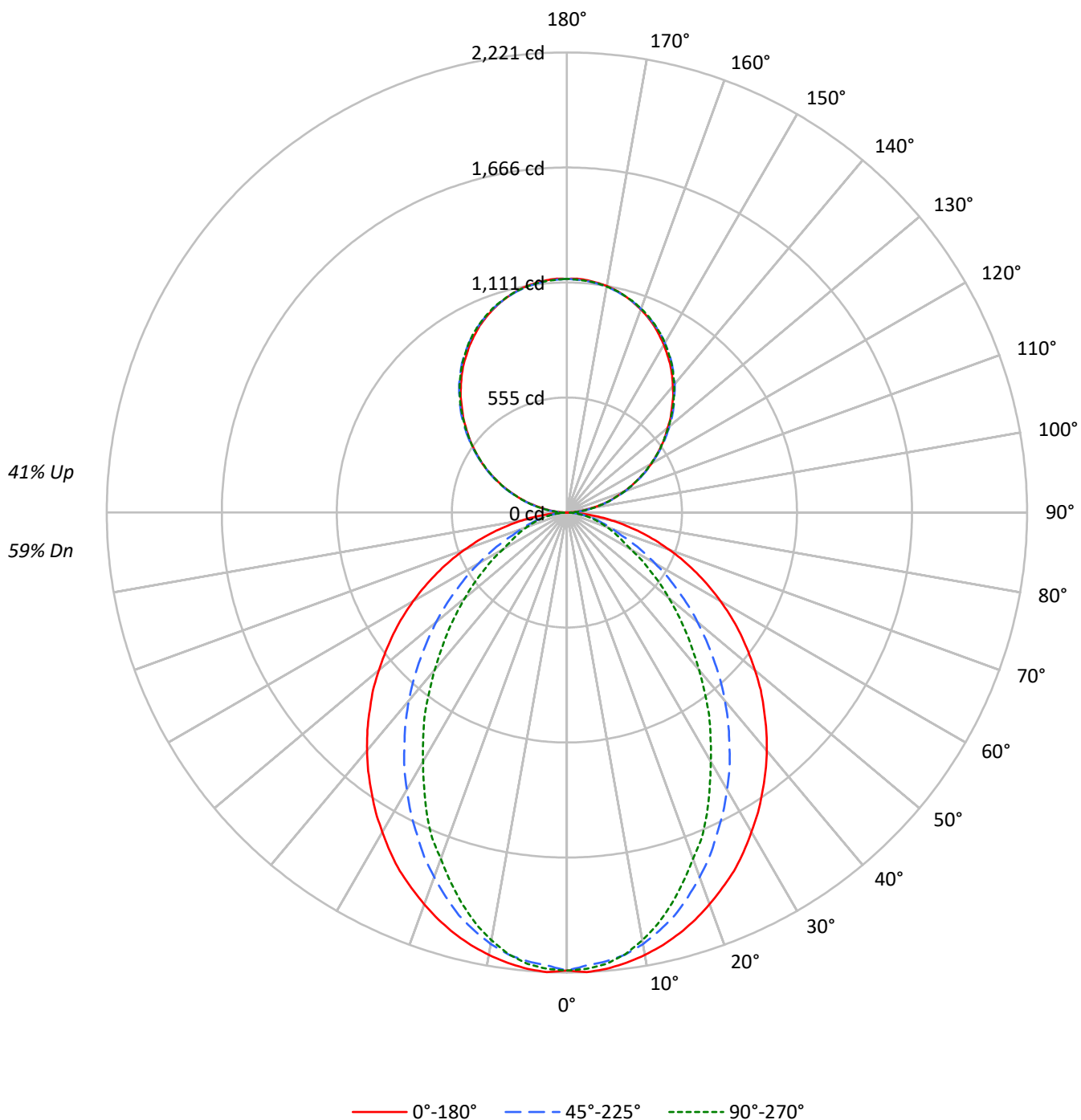
Lumens per Lamp: N/A  
Luminaire Lumens: 7704.4 lumens  
Efficiency: N/A  
Efficacy: 88.6 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 0.99 / 1.16  
Luminous Opening: Rectangular w/ Sides (W: 2.96' x L: 3.11' x H: 0.1')  
CIE Type: General Diffuse

Input Watts (W): 87  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9821  
Total Harmonic Distortion (THDi): 0.08  
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 | 76 | 76 | 76 | 64 | 64 | 64 |
| 1   | 100 | 96  | 92  | 89  | 94  | 90  | 87  | 84  | 78 | 76 | 74 | 68 | 66 | 64 | 58 | 57 | 56 |
| 2   | 92  | 85  | 79  | 74  | 86  | 79  | 74  | 70  | 69 | 65 | 62 | 60 | 57 | 55 | 52 | 50 | 48 |
| 3   | 84  | 75  | 68  | 62  | 78  | 70  | 64  | 59  | 62 | 57 | 53 | 54 | 50 | 47 | 46 | 44 | 41 |
| 4   | 77  | 67  | 59  | 53  | 72  | 63  | 56  | 51  | 55 | 50 | 46 | 48 | 44 | 41 | 42 | 39 | 36 |
| 5   | 71  | 60  | 52  | 46  | 66  | 56  | 49  | 44  | 50 | 44 | 40 | 44 | 39 | 36 | 38 | 34 | 32 |
| 6   | 66  | 54  | 46  | 40  | 61  | 51  | 44  | 39  | 45 | 39 | 35 | 40 | 35 | 32 | 35 | 31 | 28 |
| 7   | 61  | 49  | 41  | 36  | 57  | 46  | 39  | 34  | 41 | 35 | 31 | 36 | 32 | 28 | 32 | 28 | 25 |
| 8   | 57  | 45  | 37  | 32  | 53  | 42  | 35  | 30  | 38 | 32 | 28 | 33 | 29 | 25 | 29 | 26 | 23 |
| 9   | 53  | 41  | 34  | 29  | 50  | 39  | 32  | 27  | 35 | 29 | 25 | 31 | 26 | 23 | 27 | 24 | 21 |
| 10  | 50  | 38  | 31  | 26  | 47  | 36  | 29  | 25  | 32 | 27 | 23 | 29 | 24 | 21 | 25 | 22 | 19 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 2585 | 2585 | 2585 |
| 5°  | 2588 | 2542 | 2559 |
| 10° | 2560 | 2490 | 2475 |
| 15° | 2524 | 2406 | 2345 |
| 20° | 2475 | 2291 | 2186 |
| 25° | 2426 | 2162 | 2033 |
| 30° | 2360 | 2031 | 1839 |
| 35° | 2296 | 1889 | 1668 |
| 40° | 2230 | 1743 | 1473 |
| 45° | 2154 | 1581 | 1296 |
| 50° | 2075 | 1417 | 1123 |
| 55° | 1992 | 1243 | 957  |
| 60° | 1897 | 1061 | 787  |
| 65° | 1787 | 876  | 707  |
| 70° | 1653 | 703  | 638  |
| 75° | 1485 | 616  | 578  |
| 80° | 1241 | 511  | 498  |
| 85° | 844  | 332  | 368  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 2154 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 207.2  | 2.7       |
| 10°-20°   | 568.9  | 7.4       |
| 20°-30°   | 798.7  | 10.4      |
| 30°-40°   | 870.7  | 11.3      |
| 40°-50°   | 800.3  | 10.4      |
| 50°-60°   | 628.5  | 8.2       |
| 60°-70°   | 409.1  | 5.3       |
| 70°-80°   | 210.6  | 2.7       |
| 80°-90°   | 57.0   | 0.7       |
| 90°-100°  | 69.8   | 0.9       |
| 100°-110° | 221.8  | 2.9       |
| 110°-120° | 379.5  | 4.9       |
| 120°-130° | 499.2  | 6.5       |
| 130°-140° | 560.3  | 7.3       |
| 140°-150° | 549.4  | 7.1       |
| 150°-160° | 460.9  | 6.0       |
| 160°-170° | 305.7  | 4.0       |
| 170°-180° | 106.8  | 1.4       |
| 0°-30°    | 1574.9 | 20.4      |
| 0°-40°    | 2445.6 | 31.7      |
| 0°-60°    | 3874.3 | 50.3      |
| 0°-90°    | 4550.9 | 59.1      |
| 90°-120°  | 671.2  | 8.7       |
| 90°-150°  | 2280.1 | 29.6      |
| 90°-180°  | 3153.0 | 40.9      |
| 0°-180°   | 7704.4 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 2211 | 2211  | 2211 | 2211  | 2211 |      |
| 5°   | 2211 | 2201  | 2175 | 2193  | 2187 | 210  |
| 15°  | 2103 | 2081  | 2013 | 1975  | 1955 | 593  |
| 25°  | 1909 | 1845  | 1713 | 1631  | 1601 | 878  |
| 35°  | 1645 | 1543  | 1367 | 1241  | 1197 | 1030 |
| 45°  | 1345 | 1211  | 1001 | 858   | 810  | 1039 |
| 55°  | 1022 | 866   | 650  | 530   | 492  | 914  |
| 65°  | 690  | 528   | 348  | 280   | 274  | 685  |
| 75°  | 368  | 228   | 160  | 146   | 144  | 389  |
| 85°  | 86   | 44    | 38   | 38    | 38   | 99   |
| 90°  | 1    | 12    | 33   | 31    | 32   | 8    |
| 95°  | 50   | 59    | 61   | 61    | 59   | 55   |
| 105° | 205  | 207   | 210  | 211   | 211  | 216  |
| 115° | 381  | 386   | 385  | 384   | 381  | 377  |
| 125° | 554  | 562   | 560  | 557   | 556  | 495  |
| 135° | 717  | 727   | 729  | 728   | 725  | 554  |
| 145° | 870  | 877   | 882  | 883   | 880  | 544  |
| 155° | 995  | 998   | 1000 | 1005  | 1002 | 458  |
| 165° | 1082 | 1081  | 1081 | 1088  | 1083 | 305  |
| 175° | 1126 | 1123  | 1121 | 1128  | 1122 | 107  |
| 180° | 1128 | 1128  | 1128 | 1128  | 1128 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 2211.3 | 2211.3 | 2211.3 | 2211.3 | 2211.3 |
| 2.5°   | 2221.3 | 2211.3 | 2189.1 | 2209.3 | 2205.3 |
| 5°     | 2211.3 | 2201.3 | 2175.1 | 2193.3 | 2187.3 |
| 7.5°   | 2193.3 | 2181.3 | 2153.3 | 2161.1 | 2151.2 |
| 10°    | 2169.2 | 2155.2 | 2115.3 | 2109.2 | 2097.2 |
| 12.5°  | 2139.3 | 2121.2 | 2067.1 | 2055.2 | 2033.1 |
| 15°    | 2103.2 | 2081.1 | 2013.1 | 1975.1 | 1955.2 |
| 17.5°  | 2061.2 | 2029.1 | 1945.0 | 1901.0 | 1869.0 |
| 20°    | 2013.1 | 1973.0 | 1873.0 | 1823.1 | 1779.0 |
| 22.5°  | 1961.1 | 1915.0 | 1798.9 | 1731.0 | 1701.0 |
| 25°    | 1909.2 | 1845.0 | 1713.0 | 1631.0 | 1600.9 |
| 27.5°  | 1847.2 | 1779.0 | 1632.9 | 1538.8 | 1492.8 |
| 30°    | 1781.1 | 1704.9 | 1544.8 | 1442.9 | 1388.7 |
| 32.5°  | 1717.0 | 1624.9 | 1461.0 | 1340.8 | 1290.7 |
| 35°    | 1645.0 | 1542.9 | 1366.9 | 1240.7 | 1196.6 |
| 37.5°  | 1574.9 | 1464.7 | 1278.8 | 1140.6 | 1090.7 |
| 40°    | 1500.8 | 1380.9 | 1186.6 | 1044.5 | 992.6  |
| 42.5°  | 1424.9 | 1296.8 | 1094.7 | 946.5  | 896.6  |
| 45°    | 1344.8 | 1210.6 | 1000.7 | 858.4  | 810.4  |
| 47.5°  | 1268.8 | 1126.8 | 910.6  | 768.4  | 724.4  |
| 50°    | 1184.7 | 1042.7 | 822.5  | 684.3  | 642.5  |
| 52.5°  | 1102.5 | 952.4  | 738.4  | 606.4  | 568.4  |
| 55°    | 1022.5 | 866.5  | 650.3  | 530.4  | 492.3  |
| 57.5°  | 940.6  | 780.4  | 572.4  | 460.3  | 428.2  |
| 60°    | 856.5  | 696.4  | 490.3  | 388.3  | 356.2  |
| 62.5°  | 774.5  | 614.5  | 420.2  | 324.2  | 308.3  |
| 65°    | 690.5  | 528.2  | 348.2  | 280.3  | 274.1  |
| 67.5°  | 610.4  | 448.2  | 280.3  | 246.1  | 240.1  |
| 70°    | 526.3  | 370.2  | 232.0  | 212.1  | 204.0  |
| 72.5°  | 446.3  | 298.1  | 194.0  | 178.2  | 174.1  |
| 75°    | 368.2  | 228.0  | 160.1  | 146.1  | 144.2  |
| 77.5°  | 290.3  | 162.0  | 126.1  | 118.1  | 114.0  |
| 80°    | 218.0  | 116.1  | 95.9   | 88.1   | 88.1   |
| 82.5°  | 152.0  | 78.1   | 66.0   | 62.0   | 62.0   |
| 85°    | 86.0   | 44.0   | 38.0   | 38.0   | 38.0   |
| 87.5°  | 32.1   | 16.0   | 16.0   | 14.0   | 14.0   |
| 90°    | 1.0    | 12.2   | 33.3   | 31.3   | 32.3   |
| 92.5°  | 21.0   | 28.5   | 29.6   | 30.6   | 30.6   |
| 95°    | 49.7   | 59.2   | 60.9   | 60.9   | 59.2   |
| 97.5°  | 82.7   | 91.5   | 95.2   | 95.2   | 95.2   |
| 100°   | 120.7  | 128.6  | 131.3  | 131.3  | 130.3  |
| 102.5° | 160.9  | 166.7  | 170.4  | 171.4  | 170.4  |
| 105°   | 204.7  | 207.4  | 209.5  | 211.2  | 211.2  |
| 107.5° | 248.3  | 252.4  | 252.4  | 253.0  | 248.3  |
| 110°   | 290.4  | 295.9  | 295.9  | 295.9  | 293.2  |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 336.0  | 341.8  | 340.7  | 338.0  | 336.0  |
| 115°   | 380.8  | 386.4  | 384.6  | 383.6  | 380.8  |
| 117.5° | 425.4  | 432.9  | 428.2  | 425.4  | 422.8  |
| 120°   | 470.4  | 477.8  | 470.4  | 470.4  | 467.3  |
| 122.5° | 511.1  | 520.7  | 515.9  | 513.2  | 511.1  |
| 125°   | 554.0  | 562.5  | 559.8  | 556.7  | 555.7  |
| 127.5° | 595.8  | 606.4  | 602.6  | 598.5  | 595.8  |
| 130°   | 634.9  | 647.2  | 645.5  | 643.5  | 639.7  |
| 132.5° | 678.8  | 688.3  | 689.0  | 684.2  | 681.5  |
| 135°   | 716.6  | 727.1  | 729.2  | 728.1  | 725.4  |
| 137.5° | 758.8  | 767.2  | 768.9  | 768.2  | 764.2  |
| 140°   | 795.8  | 804.3  | 809.0  | 809.0  | 805.3  |
| 142.5° | 833.9  | 842.4  | 845.1  | 846.1  | 842.4  |
| 145°   | 870.0  | 876.7  | 882.2  | 883.2  | 879.5  |
| 147.5° | 902.2  | 910.7  | 914.8  | 916.5  | 912.8  |
| 150°   | 935.6  | 941.4  | 945.1  | 948.2  | 945.1  |
| 152.5° | 965.2  | 970.9  | 975.7  | 979.5  | 975.7  |
| 155°   | 994.7  | 997.5  | 1000.5 | 1005.3 | 1002.2 |
| 157.5° | 1020.3 | 1022.3 | 1024.0 | 1030.8 | 1026.0 |
| 160°   | 1043.0 | 1045.1 | 1046.1 | 1051.9 | 1047.8 |
| 162.5° | 1064.1 | 1064.1 | 1065.1 | 1071.6 | 1066.8 |
| 165°   | 1082.2 | 1081.1 | 1081.1 | 1087.9 | 1083.2 |
| 167.5° | 1098.5 | 1095.4 | 1095.4 | 1102.2 | 1097.4 |
| 170°   | 1110.7 | 1108.0 | 1107.0 | 1113.7 | 1108.0 |
| 172.5° | 1119.2 | 1116.5 | 1115.4 | 1122.3 | 1116.5 |
| 175°   | 1126.1 | 1123.3 | 1121.2 | 1128.0 | 1122.3 |
| 177.5° | 1129.8 | 1127.0 | 1125.0 | 1130.8 | 1125.0 |
| 180°   | 1128.0 | 1128.0 | 1128.0 | 1128.0 | 1128.0 |

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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 | 11.21            | 12.12 | 12.10 | 13.02 | 14.16 | 7.18           | 8.09  | 8.06  | 8.99  | 10.13 |
|                 | 3H   | 12.89            | 13.71 | 13.79 | 14.61 | 15.78 | 8.37           | 9.18  | 9.26  | 10.09 | 11.25 |
|                 | 4H   | 13.50            | 14.27 | 14.41 | 15.18 | 16.35 | 8.82           | 9.59  | 9.73  | 10.50 | 11.67 |
|                 | 6H   | 13.92            | 14.63 | 14.84 | 15.55 | 16.73 | 9.14           | 9.85  | 10.06 | 10.77 | 11.95 |
|                 | 8H   | 14.05            | 14.72 | 14.98 | 15.66 | 16.84 | 9.23           | 9.90  | 10.16 | 10.84 | 12.02 |
|                 | 12H  | 14.11            | 14.75 | 15.04 | 15.68 | 16.89 | 9.27           | 9.91  | 10.21 | 10.84 | 12.05 |
| 4H              | 2H   | 11.24            | 12.01 | 12.16 | 12.92 | 14.10 | 7.78           | 8.55  | 8.70  | 9.46  | 10.64 |
|                 | 3H   | 13.07            | 13.71 | 13.99 | 14.65 | 15.84 | 9.13           | 9.77  | 10.06 | 10.71 | 11.90 |
|                 | 4H   | 13.76            | 14.34 | 14.70 | 15.28 | 16.49 | 9.68           | 10.26 | 10.61 | 11.20 | 12.41 |
|                 | 6H   | 14.27            | 14.77 | 15.22 | 15.74 | 16.95 | 10.10          | 10.60 | 11.05 | 11.56 | 12.77 |
|                 | 8H   | 14.45            | 14.91 | 15.40 | 15.87 | 17.10 | 10.22          | 10.69 | 11.17 | 11.65 | 12.87 |
|                 | 12H  | 14.54            | 14.96 | 15.51 | 15.94 | 17.17 | 10.29          | 10.71 | 11.26 | 11.68 | 12.92 |
| 8H              | 4H   | 13.73            | 14.20 | 14.68 | 15.16 | 16.38 | 9.96           | 10.43 | 10.91 | 11.38 | 12.61 |
|                 | 6H   | 14.29            | 14.68 | 15.27 | 15.68 | 16.91 | 10.47          | 10.86 | 11.45 | 11.86 | 13.09 |
|                 | 8H   | 14.51            | 14.85 | 15.49 | 15.84 | 17.08 | 10.66          | 11.00 | 11.65 | 11.99 | 13.23 |
|                 | 12H  | 14.64            | 14.94 | 15.63 | 15.93 | 17.22 | 10.78          | 11.08 | 11.77 | 12.06 | 13.35 |
| 12H             | 4H   | 13.69            | 14.11 | 14.66 | 15.08 | 16.32 | 9.97           | 10.39 | 10.94 | 11.36 | 12.60 |
|                 | 6H   | 14.27            | 14.61 | 15.26 | 15.60 | 16.84 | 10.52          | 10.86 | 11.51 | 11.85 | 13.10 |
|                 | 8H   | 14.49            | 14.79 | 15.48 | 15.77 | 17.06 | 10.73          | 11.03 | 11.72 | 12.01 | 13.30 |