

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: P913287

Luminaire Tested: DFN2DIP-4P4F0-070D040US927-FLLONL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P913287  
REPORT IS A COMBINATION OF REPORTS P900619 AND P897523  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-4P4F0-070D040US927-FLLONL  
Description: 4 foot, 90deg - 4way Define Geo, with Direct Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

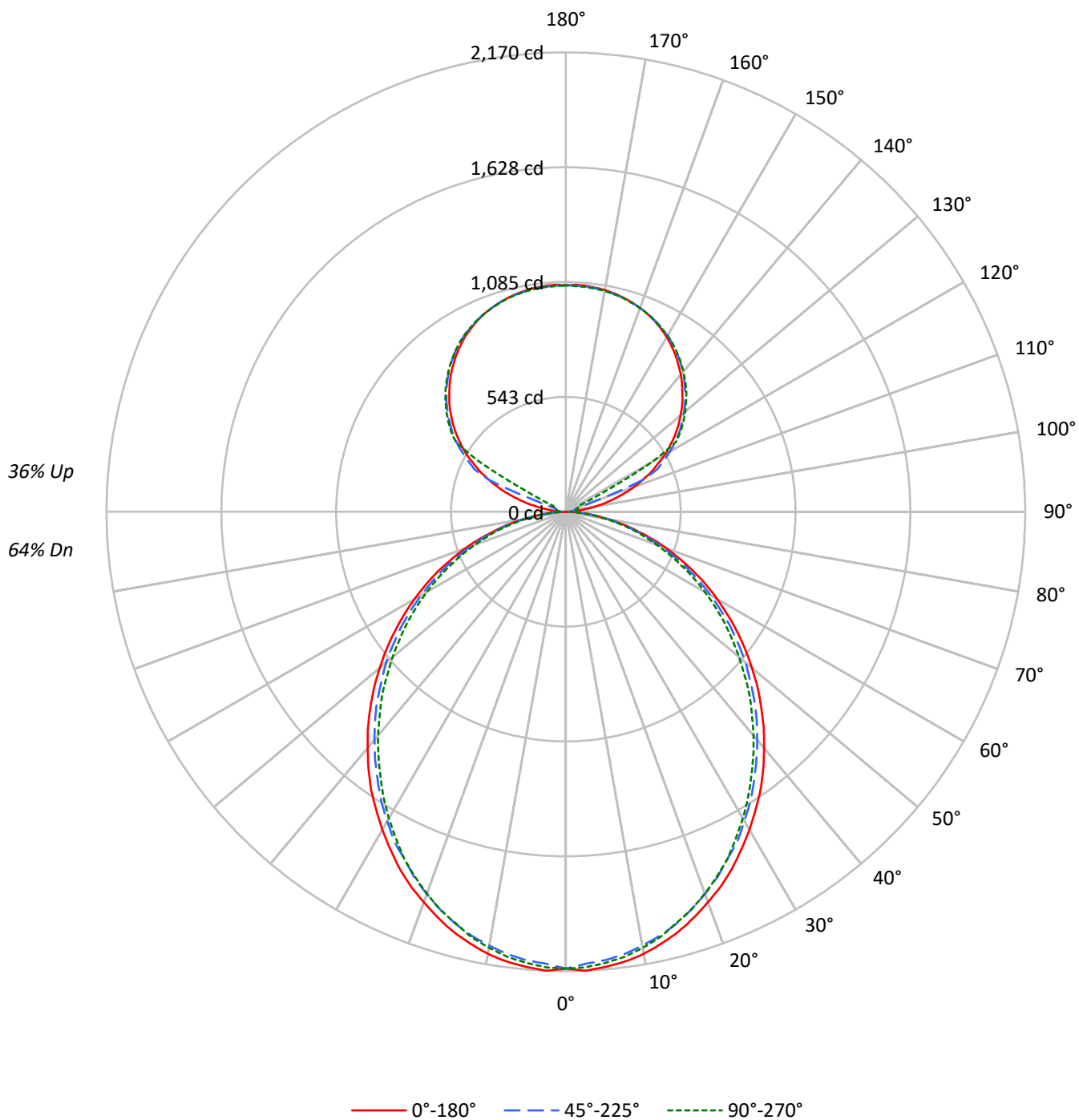
Lumens per Lamp: N/A  
Luminaire Lumens: 8626.9 lumens  
Efficiency: N/A  
Efficacy: 82.1 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 4.07' x L: 4.07' x H: 0.1')  
CIE Type: Semi-Direct

Input Watts (W): 105.1  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9789  
Total Harmonic Distortion (THDi): 0.074  
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   | 110 | 110 | 110 | 110 | 104 | 104 | 104 | 104 | 91 | 91 | 91 | 79 | 79 | 79 | 69 | 69 | 69 |
| 1   | 101 | 96  | 92  | 89  | 94  | 91  | 87  | 84  | 80 | 77 | 75 | 70 | 68 | 66 | 61 | 59 | 58 |
| 2   | 92  | 84  | 78  | 73  | 86  | 79  | 74  | 69  | 70 | 66 | 62 | 61 | 58 | 55 | 53 | 51 | 49 |
| 3   | 84  | 74  | 67  | 61  | 78  | 70  | 63  | 58  | 62 | 57 | 52 | 54 | 50 | 47 | 47 | 44 | 42 |
| 4   | 77  | 66  | 58  | 51  | 72  | 62  | 55  | 49  | 55 | 49 | 45 | 48 | 44 | 40 | 42 | 39 | 36 |
| 5   | 71  | 59  | 50  | 44  | 66  | 55  | 48  | 42  | 49 | 43 | 39 | 44 | 39 | 35 | 38 | 34 | 31 |
| 6   | 65  | 53  | 44  | 38  | 61  | 50  | 42  | 37  | 44 | 38 | 34 | 39 | 34 | 31 | 35 | 31 | 28 |
| 7   | 60  | 48  | 39  | 34  | 56  | 45  | 38  | 32  | 40 | 34 | 30 | 36 | 31 | 27 | 32 | 28 | 25 |
| 8   | 56  | 43  | 35  | 30  | 52  | 41  | 34  | 29  | 37 | 31 | 27 | 33 | 28 | 24 | 29 | 25 | 22 |
| 9   | 52  | 40  | 32  | 27  | 49  | 38  | 31  | 26  | 34 | 28 | 24 | 30 | 25 | 22 | 27 | 23 | 20 |
| 10  | 49  | 36  | 29  | 24  | 46  | 35  | 28  | 23  | 31 | 26 | 22 | 28 | 23 | 20 | 25 | 21 | 18 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 1400 | 1400 | 1400 |
| 5°  | 1402 | 1381 | 1390 |
| 10° | 1391 | 1363 | 1372 |
| 15° | 1371 | 1341 | 1343 |
| 20° | 1343 | 1310 | 1313 |
| 25° | 1316 | 1273 | 1279 |
| 30° | 1281 | 1239 | 1235 |
| 35° | 1249 | 1198 | 1189 |
| 40° | 1209 | 1157 | 1145 |
| 45° | 1169 | 1117 | 1100 |
| 50° | 1125 | 1074 | 1048 |
| 55° | 1079 | 1024 | 1000 |
| 60° | 1028 | 965  | 945  |
| 65° | 971  | 904  | 881  |
| 70° | 900  | 830  | 811  |
| 75° | 800  | 741  | 748  |
| 80° | 681  | 628  | 626  |
| 85° | 494  | 432  | 422  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 1169 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 203.1  | 2.4       |
| 10°-20°   | 571.4  | 6.6       |
| 20°-30°   | 839.7  | 9.7       |
| 30°-40°   | 975.3  | 11.3      |
| 40°-50°   | 974.1  | 11.3      |
| 50°-60°   | 849.4  | 9.8       |
| 60°-70°   | 627.9  | 7.3       |
| 70°-80°   | 355.2  | 4.1       |
| 80°-90°   | 95.6   | 1.1       |
| 90°-100°  | 35.2   | 0.4       |
| 100°-110° | 131.5  | 1.5       |
| 110°-120° | 348.6  | 4.0       |
| 120°-130° | 578.2  | 6.7       |
| 130°-140° | 614.2  | 7.1       |
| 140°-150° | 570.9  | 6.6       |
| 150°-160° | 458.9  | 5.3       |
| 160°-170° | 295.7  | 3.4       |
| 170°-180° | 101.8  | 1.2       |
| 0°-30°    | 1614.2 | 18.7      |
| 0°-40°    | 2589.5 | 30.0      |
| 0°-60°    | 4412.9 | 51.2      |
| 0°-90°    | 5491.7 | 63.7      |
| 90°-120°  | 515.3  | 6.0       |
| 90°-150°  | 2278.7 | 26.4      |
| 90°-180°  | 3135.0 | 36.3      |
| 0°-180°   | 8626.9 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 2158 | 2158  | 2158 | 2158  | 2158 |      |
| 5°   | 2158 | 2150  | 2127 | 2143  | 2139 | 205  |
| 15°  | 2054 | 2042  | 2015 | 2023  | 2013 | 578  |
| 25°  | 1859 | 1842  | 1807 | 1811  | 1807 | 855  |
| 35°  | 1604 | 1583  | 1550 | 1537  | 1527 | 1002 |
| 45°  | 1305 | 1291  | 1259 | 1237  | 1228 | 1007 |
| 55°  | 988  | 975   | 950  | 925   | 915  | 883  |
| 65°  | 666  | 654   | 633  | 614   | 604  | 659  |
| 75°  | 348  | 344   | 334  | 322   | 326  | 372  |
| 85°  | 85   | 83    | 81   | 75    | 73   | 95   |
| 90°  | 1    | 9     | 15   | 19    | 21   | 8    |
| 95°  | 50   | 25    | 30   | 34    | 33   | 60   |
| 105° | 235  | 258   | 47   | 56    | 59   | 251  |
| 115° | 445  | 458   | 477  | 119   | 64   | 438  |
| 125° | 629  | 639   | 654  | 659   | 662  | 561  |
| 135° | 778  | 791   | 798  | 806   | 804  | 601  |
| 145° | 903  | 902   | 915  | 921   | 917  | 565  |
| 155° | 994  | 988   | 997  | 1001  | 995  | 458  |
| 165° | 1048 | 1043  | 1045 | 1051  | 1045 | 296  |
| 175° | 1072 | 1066  | 1068 | 1073  | 1066 | 102  |
| 180° | 1069 | 1069  | 1069 | 1069  | 1069 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 2157.7 | 2157.7 | 2157.7 | 2157.7 | 2157.7 |
| 2.5°   | 2170.3 | 2159.9 | 2137.0 | 2157.7 | 2153.7 |
| 5°     | 2157.7 | 2149.6 | 2126.7 | 2143.2 | 2139.2 |
| 7.5°   | 2143.2 | 2130.8 | 2107.9 | 2124.7 | 2120.5 |
| 10°    | 2120.5 | 2105.9 | 2081.1 | 2097.6 | 2091.4 |
| 12.5°  | 2089.2 | 2076.9 | 2052.1 | 2062.4 | 2058.2 |
| 15°    | 2054.0 | 2041.7 | 2014.6 | 2023.0 | 2012.6 |
| 17.5°  | 2010.4 | 1998.1 | 1971.0 | 1981.4 | 1971.0 |
| 20°    | 1962.6 | 1950.4 | 1921.3 | 1927.5 | 1919.3 |
| 22.5°  | 1915.1 | 1896.4 | 1869.3 | 1869.3 | 1865.1 |
| 25°    | 1859.0 | 1842.5 | 1807.3 | 1811.2 | 1807.3 |
| 27.5°  | 1796.7 | 1782.2 | 1755.3 | 1749.1 | 1738.8 |
| 30°    | 1734.6 | 1717.8 | 1686.9 | 1680.7 | 1672.3 |
| 32.5°  | 1668.1 | 1655.8 | 1622.5 | 1610.0 | 1601.6 |
| 35°    | 1603.8 | 1583.2 | 1549.9 | 1537.4 | 1527.0 |
| 37.5°  | 1531.2 | 1512.5 | 1479.2 | 1464.7 | 1454.4 |
| 40°    | 1456.6 | 1439.9 | 1406.6 | 1388.1 | 1379.7 |
| 42.5°  | 1383.9 | 1367.2 | 1334.2 | 1313.3 | 1300.9 |
| 45°    | 1305.1 | 1290.6 | 1259.3 | 1236.7 | 1228.3 |
| 47.5°  | 1228.3 | 1213.8 | 1180.5 | 1157.6 | 1145.3 |
| 50°    | 1147.3 | 1136.9 | 1107.9 | 1078.9 | 1068.5 |
| 52.5°  | 1068.5 | 1054.0 | 1027.1 | 1004.2 | 989.7  |
| 55°    | 987.7  | 975.2  | 950.3  | 925.4  | 915.0  |
| 57.5°  | 906.7  | 896.4  | 869.3  | 844.4  | 836.1  |
| 60°    | 825.7  | 817.5  | 788.5  | 765.6  | 759.5  |
| 62.5°  | 746.9  | 732.4  | 711.7  | 691.0  | 682.6  |
| 65°    | 666.1  | 653.5  | 632.9  | 614.2  | 603.8  |
| 67.5°  | 583.1  | 572.6  | 554.1  | 539.6  | 531.2  |
| 70°    | 506.3  | 498.0  | 479.2  | 464.7  | 456.5  |
| 72.5°  | 427.5  | 419.1  | 408.8  | 394.3  | 388.1  |
| 75°    | 348.5  | 344.5  | 333.9  | 321.6  | 325.8  |
| 77.5°  | 278.1  | 269.7  | 265.5  | 259.3  | 253.2  |
| 80°    | 207.6  | 205.4  | 201.2  | 195.0  | 190.8  |
| 82.5°  | 141.1  | 141.1  | 139.1  | 130.8  | 130.8  |
| 85°    | 85.0   | 83.0   | 81.0   | 74.6   | 72.6   |
| 87.5°  | 37.4   | 33.3   | 29.1   | 22.9   | 20.7   |
| 90°    | 0.7    | 9.3    | 15.4   | 19.4   | 20.8   |
| 92.5°  | 19.4   | 16.2   | 18.5   | 20.1   | 20.8   |
| 95°    | 50.2   | 24.7   | 30.1   | 34.1   | 33.3   |
| 97.5°  | 90.5   | 27.1   | 39.5   | 41.8   | 42.5   |
| 100°   | 137.0  | 31.0   | 44.1   | 50.2   | 51.8   |
| 102.5° | 188.0  | 186.6  | 45.6   | 54.1   | 56.5   |
| 105°   | 235.2  | 258.5  | 47.2   | 55.7   | 58.8   |
| 107.5° | 290.2  | 309.5  | 48.8   | 57.3   | 60.4   |
| 110°   | 342.9  | 359.0  | 135.5  | 58.1   | 61.1   |



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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 392.4  | 406.2  | 393.1  | 59.6   | 61.9   |
| 115°   | 444.9  | 458.0  | 477.4  | 119.1  | 63.5   |
| 117.5° | 490.6  | 506.0  | 519.3  | 408.5  | 205.8  |
| 120°   | 541.7  | 553.3  | 567.2  | 576.5  | 472.1  |
| 122.5° | 584.9  | 597.4  | 612.9  | 617.5  | 618.3  |
| 125°   | 629.1  | 639.2  | 653.9  | 659.3  | 661.6  |
| 127.5° | 669.3  | 680.2  | 691.8  | 699.6  | 700.3  |
| 130°   | 707.3  | 719.7  | 728.1  | 736.6  | 735.9  |
| 132.5° | 745.9  | 756.1  | 764.5  | 771.5  | 770.8  |
| 135°   | 778.5  | 790.9  | 797.8  | 805.6  | 804.1  |
| 137.5° | 812.5  | 821.7  | 829.6  | 837.3  | 835.0  |
| 140°   | 845.7  | 852.0  | 860.5  | 867.4  | 863.6  |
| 142.5° | 873.7  | 879.1  | 889.1  | 895.2  | 891.4  |
| 145°   | 903.1  | 902.3  | 915.4  | 920.8  | 916.9  |
| 147.5° | 928.5  | 926.2  | 939.4  | 943.3  | 940.2  |
| 150°   | 953.3  | 947.9  | 960.4  | 965.0  | 961.1  |
| 152.5° | 974.2  | 968.0  | 979.6  | 984.3  | 978.9  |
| 155°   | 994.3  | 987.5  | 996.7  | 1001.3 | 995.1  |
| 157.5° | 1010.6 | 1004.4 | 1011.5 | 1016.8 | 1010.6 |
| 160°   | 1024.5 | 1019.9 | 1024.5 | 1029.1 | 1023.7 |
| 162.5° | 1036.9 | 1032.3 | 1036.2 | 1041.6 | 1034.6 |
| 165°   | 1047.7 | 1043.1 | 1045.4 | 1050.8 | 1045.4 |
| 167.5° | 1056.3 | 1051.5 | 1054.0 | 1059.4 | 1052.4 |
| 170°   | 1063.3 | 1058.6 | 1060.1 | 1065.6 | 1058.6 |
| 172.5° | 1067.9 | 1063.3 | 1064.8 | 1070.2 | 1063.3 |
| 175°   | 1071.7 | 1066.3 | 1067.9 | 1073.2 | 1065.6 |
| 177.5° | 1073.2 | 1067.9 | 1068.7 | 1074.1 | 1067.1 |
| 180°   | 1069.4 | 1069.4 | 1069.4 | 1069.4 | 1069.4 |



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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 | 9.63             | 10.63 | 10.46 | 11.48 | 12.55 | 9.19           | 10.19 | 10.02 | 11.04 | 12.10 |
|                 | 3H   | 11.31            | 12.21 | 12.15 | 13.07 | 14.16 | 10.82          | 11.72 | 11.66 | 12.58 | 13.67 |
|                 | 4H   | 11.91            | 12.75 | 12.77 | 13.62 | 14.72 | 11.41          | 12.26 | 12.27 | 13.13 | 14.23 |
|                 | 6H   | 12.32            | 13.10 | 13.19 | 13.98 | 15.09 | 11.82          | 12.60 | 12.69 | 13.48 | 14.59 |
|                 | 8H   | 12.43            | 13.17 | 13.31 | 14.07 | 15.18 | 11.93          | 12.67 | 12.81 | 13.57 | 14.68 |
|                 | 12H  | 12.48            | 13.19 | 13.37 | 14.08 | 15.22 | 11.97          | 12.68 | 12.86 | 13.57 | 14.71 |
| 4H              | 2H   | 10.11            | 10.96 | 10.98 | 11.83 | 12.93 | 9.76           | 10.60 | 10.62 | 11.47 | 12.57 |
|                 | 3H   | 12.00            | 12.70 | 12.87 | 13.60 | 14.72 | 11.59          | 12.30 | 12.46 | 13.20 | 14.31 |
|                 | 4H   | 12.72            | 13.37 | 13.61 | 14.26 | 15.40 | 12.30          | 12.94 | 13.18 | 13.84 | 14.98 |
|                 | 6H   | 13.25            | 13.81 | 14.15 | 14.73 | 15.87 | 12.82          | 13.37 | 13.72 | 14.30 | 15.44 |
|                 | 8H   | 13.40            | 13.93 | 14.31 | 14.84 | 16.00 | 12.97          | 13.49 | 13.87 | 14.40 | 15.56 |
|                 | 12H  | 13.49            | 13.96 | 14.41 | 14.89 | 16.05 | 13.04          | 13.51 | 13.96 | 14.44 | 15.60 |
| 8H              | 4H   | 12.93            | 13.45 | 13.83 | 14.37 | 15.52 | 12.55          | 13.07 | 13.46 | 13.99 | 15.15 |
|                 | 6H   | 13.57            | 14.00 | 14.50 | 14.96 | 16.12 | 13.19          | 13.62 | 14.12 | 14.58 | 15.73 |
|                 | 8H   | 13.80            | 14.18 | 14.74 | 15.13 | 16.30 | 13.41          | 13.79 | 14.35 | 14.74 | 15.91 |
|                 | 12H  | 13.94            | 14.28 | 14.89 | 15.22 | 16.44 | 13.53          | 13.87 | 14.47 | 14.81 | 16.03 |
| 12H             | 4H   | 12.92            | 13.39 | 13.85 | 14.33 | 15.49 | 12.55          | 13.02 | 13.48 | 13.96 | 15.12 |
|                 | 6H   | 13.60            | 13.99 | 14.55 | 14.94 | 16.11 | 13.23          | 13.61 | 14.17 | 14.56 | 15.74 |
|                 | 8H   | 13.86            | 14.19 | 14.80 | 15.14 | 16.36 | 13.48          | 13.81 | 14.42 | 14.76 | 15.98 |