

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: P917042

Luminaire Tested: DFN2DIP-PN4F0-110D050US930-RLLFLL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P917042  
REPORT IS A COMBINATION OF REPORTS P899642 AND P896497  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-PN4F0-110D050US930-RLLFLL  
Description: 4 foot, Pentagon Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

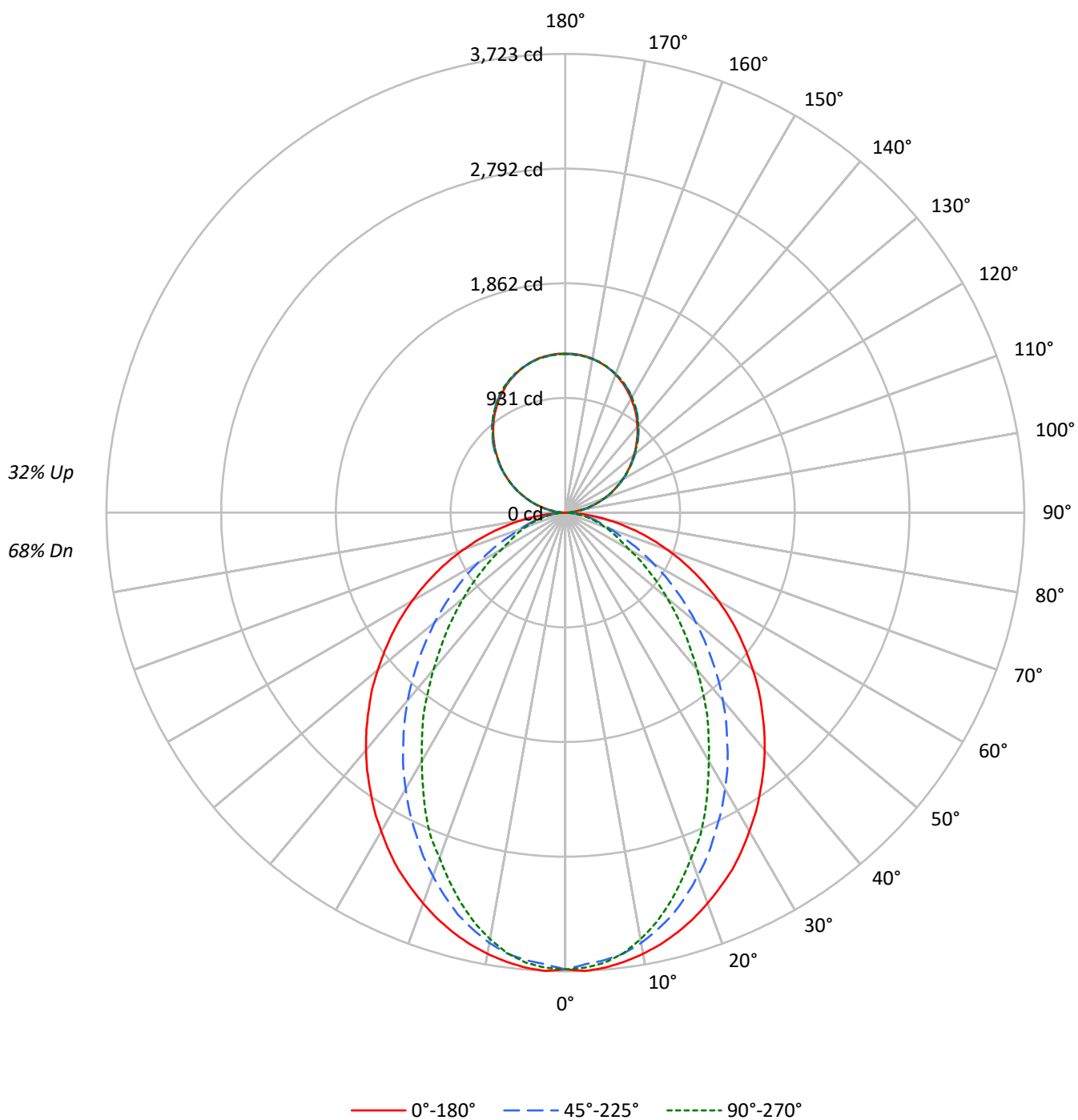
Lumens per Lamp: N/A  
Luminaire Lumens: 11230.7 lumens  
Efficiency: N/A  
Efficacy: 73.9 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 0.99 / 1.16  
Luminous Opening: Rectangular w/ Sides (W: 3.74' x L: 3.94' x H: 0.1')  
CIE Type: Semi-Direct

Input Watts (W): 151.9  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.996  
Total Harmonic Distortion (THDi): 0.064  
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   | 111 | 111 | 111 | 111 | 105 | 105 | 105 | 105 | 93 | 93 | 93 | 82 | 82 | 82 | 73 | 73 | 73 |
| 1   | 102 | 98  | 94  | 91  | 97  | 93  | 90  | 87  | 83 | 80 | 78 | 74 | 72 | 70 | 65 | 64 | 63 |
| 2   | 94  | 87  | 81  | 76  | 88  | 82  | 77  | 72  | 73 | 69 | 66 | 66 | 62 | 60 | 58 | 56 | 54 |
| 3   | 86  | 77  | 70  | 64  | 81  | 73  | 66  | 61  | 65 | 60 | 56 | 59 | 55 | 51 | 52 | 49 | 47 |
| 4   | 79  | 68  | 61  | 55  | 74  | 65  | 58  | 53  | 59 | 53 | 49 | 53 | 48 | 45 | 47 | 44 | 41 |
| 5   | 73  | 61  | 53  | 47  | 69  | 58  | 51  | 46  | 53 | 47 | 42 | 48 | 43 | 39 | 43 | 39 | 36 |
| 6   | 68  | 56  | 47  | 42  | 64  | 53  | 46  | 40  | 48 | 42 | 37 | 43 | 38 | 35 | 39 | 35 | 32 |
| 7   | 63  | 50  | 42  | 37  | 59  | 48  | 41  | 36  | 44 | 38 | 33 | 40 | 35 | 31 | 36 | 32 | 29 |
| 8   | 58  | 46  | 38  | 33  | 55  | 44  | 37  | 32  | 40 | 34 | 30 | 37 | 32 | 28 | 33 | 29 | 26 |
| 9   | 55  | 42  | 35  | 30  | 52  | 40  | 34  | 29  | 37 | 31 | 27 | 34 | 29 | 25 | 31 | 27 | 24 |
| 10  | 51  | 39  | 32  | 27  | 48  | 37  | 31  | 26  | 34 | 29 | 25 | 31 | 27 | 23 | 29 | 25 | 22 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 2706 | 2706 | 2706 |
| 5°  | 2710 | 2663 | 2680 |
| 10° | 2683 | 2611 | 2594 |
| 15° | 2646 | 2525 | 2459 |
| 20° | 2597 | 2407 | 2294 |
| 25° | 2547 | 2274 | 2135 |
| 30° | 2480 | 2137 | 1932 |
| 35° | 2414 | 1990 | 1755 |
| 40° | 2347 | 1839 | 1551 |
| 45° | 2269 | 1670 | 1366 |
| 50° | 2189 | 1500 | 1185 |
| 55° | 2105 | 1318 | 1012 |
| 60° | 2008 | 1128 | 833  |
| 65° | 1896 | 934  | 751  |
| 70° | 1760 | 754  | 680  |
| 75° | 1590 | 665  | 620  |
| 80° | 1343 | 559  | 539  |
| 85° | 935  | 375  | 409  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 2269 cd/sqm

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CATALOG NUMBER: DFN2DIP-PN4F0-110D050US930-RLFL

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 347.4   | 3.1       |
| 10°-20°   | 953.6   | 8.5       |
| 20°-30°   | 1338.9  | 11.9      |
| 30°-40°   | 1459.5  | 13.0      |
| 40°-50°   | 1341.4  | 11.9      |
| 50°-60°   | 1053.5  | 9.4       |
| 60°-70°   | 685.7   | 6.1       |
| 70°-80°   | 353.0   | 3.1       |
| 80°-90°   | 93.8    | 0.8       |
| 90°-100°  | 79.8    | 0.7       |
| 100°-110° | 253.5   | 2.3       |
| 110°-120° | 433.8   | 3.9       |
| 120°-130° | 570.5   | 5.1       |
| 130°-140° | 640.4   | 5.7       |
| 140°-150° | 627.9   | 5.6       |
| 150°-160° | 526.8   | 4.7       |
| 160°-170° | 349.3   | 3.1       |
| 170°-180° | 122.1   | 1.1       |
| 0°-30°    | 2639.9  | 23.5      |
| 0°-40°    | 4099.4  | 36.5      |
| 0°-60°    | 6494.2  | 57.8      |
| 0°-90°    | 7626.7  | 67.9      |
| 90°-120°  | 767.0   | 6.8       |
| 90°-150°  | 2605.8  | 23.2      |
| 90°-180°  | 3604.0  | 32.1      |
| 0°-180°   | 11230.7 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 3707 | 3707  | 3707 | 3707  | 3707 |      |
| 5°   | 3707 | 3690  | 3646 | 3676  | 3666 | 351  |
| 15°  | 3525 | 3488  | 3374 | 3311  | 3277 | 993  |
| 25°  | 3200 | 3093  | 2871 | 2734  | 2683 | 1472 |
| 35°  | 2757 | 2586  | 2291 | 2080  | 2006 | 1726 |
| 45°  | 2254 | 2029  | 1677 | 1439  | 1358 | 1741 |
| 55°  | 1714 | 1452  | 1090 | 889   | 825  | 1532 |
| 65°  | 1157 | 885   | 584  | 470   | 459  | 1147 |
| 75°  | 617  | 382   | 268  | 245   | 242  | 653  |
| 85°  | 144  | 74    | 64   | 64    | 64   | 165  |
| 90°  | 1    | 14    | 38   | 36    | 37   | 11   |
| 95°  | 57   | 68    | 70   | 70    | 68   | 63   |
| 105° | 234  | 237   | 240  | 241   | 241  | 247  |
| 115° | 435  | 442   | 440  | 438   | 435  | 431  |
| 125° | 633  | 643   | 640  | 636   | 635  | 566  |
| 135° | 819  | 831   | 833  | 832   | 829  | 633  |
| 145° | 994  | 1002  | 1008 | 1009  | 1005 | 621  |
| 155° | 1137 | 1140  | 1144 | 1149  | 1145 | 523  |
| 165° | 1237 | 1236  | 1236 | 1243  | 1238 | 349  |
| 175° | 1287 | 1284  | 1282 | 1289  | 1283 | 122  |
| 180° | 1289 | 1289  | 1289 | 1289  | 1289 |      |

TEST NUMBER: P917042

CATALOG NUMBER: DFN2DIP-PN4F0-110D050US930-RLFL

**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 3706.6 | 3706.6 | 3706.6 | 3706.6 | 3706.6 |
| 2.5°   | 3723.3 | 3706.6 | 3669.6 | 3703.4 | 3696.6 |
| 5°     | 3706.6 | 3689.9 | 3646.1 | 3676.3 | 3666.4 |
| 7.5°   | 3676.3 | 3656.4 | 3609.4 | 3622.6 | 3605.8 |
| 10°    | 3636.1 | 3612.6 | 3545.7 | 3535.4 | 3515.5 |
| 12.5°  | 3585.9 | 3555.7 | 3464.9 | 3445.0 | 3407.9 |
| 15°    | 3525.4 | 3488.4 | 3374.5 | 3310.8 | 3277.3 |
| 17.5°  | 3455.0 | 3401.3 | 3260.3 | 3186.6 | 3132.9 |
| 20°    | 3374.5 | 3307.3 | 3139.6 | 3056.0 | 2982.0 |
| 22.5°  | 3287.4 | 3210.1 | 3015.5 | 2901.6 | 2851.3 |
| 25°    | 3200.1 | 3092.7 | 2871.3 | 2733.9 | 2683.4 |
| 27.5°  | 3096.3 | 2982.0 | 2737.1 | 2579.4 | 2502.2 |
| 30°    | 2985.5 | 2857.8 | 2589.5 | 2418.6 | 2327.8 |
| 32.5°  | 2878.1 | 2723.6 | 2448.8 | 2247.5 | 2163.5 |
| 35°    | 2757.4 | 2586.2 | 2291.2 | 2079.8 | 2005.8 |
| 37.5°  | 2640.0 | 2455.3 | 2143.5 | 1911.8 | 1828.2 |
| 40°    | 2515.8 | 2314.7 | 1989.1 | 1750.9 | 1663.8 |
| 42.5°  | 2388.3 | 2173.7 | 1835.0 | 1586.6 | 1502.9 |
| 45°    | 2254.2 | 2029.3 | 1677.3 | 1438.8 | 1358.4 |
| 47.5°  | 2126.8 | 1888.7 | 1526.4 | 1287.9 | 1214.3 |
| 50°    | 1985.8 | 1747.8 | 1378.8 | 1147.0 | 1076.9 |
| 52.5°  | 1848.1 | 1596.5 | 1237.8 | 1016.4 | 952.7  |
| 55°    | 1713.9 | 1452.4 | 1090.1 | 889.0  | 825.3  |
| 57.5°  | 1576.6 | 1308.2 | 959.4  | 771.6  | 717.8  |
| 60°    | 1435.7 | 1167.3 | 821.7  | 650.9  | 597.2  |
| 62.5°  | 1298.3 | 1030.0 | 704.3  | 543.5  | 516.7  |
| 65°    | 1157.3 | 885.4  | 583.7  | 469.8  | 459.4  |
| 67.5°  | 1023.2 | 751.3  | 469.8  | 412.5  | 402.5  |
| 70°    | 882.2  | 620.7  | 389.0  | 355.6  | 342.0  |
| 72.5°  | 748.0  | 499.7  | 325.3  | 298.6  | 291.8  |
| 75°    | 617.1  | 382.2  | 268.3  | 244.8  | 241.7  |
| 77.5°  | 486.5  | 271.6  | 211.4  | 197.9  | 191.1  |
| 80°    | 365.5  | 194.7  | 160.9  | 147.7  | 147.7  |
| 82.5°  | 254.8  | 130.9  | 110.7  | 104.0  | 104.0  |
| 85°    | 144.1  | 73.7   | 63.7   | 63.7   | 63.7   |
| 87.5°  | 53.7   | 26.7   | 26.7   | 23.5   | 23.5   |
| 90°    | 1.1    | 14.0   | 38.1   | 35.8   | 36.9   |
| 92.5°  | 24.1   | 32.6   | 33.8   | 35.0   | 35.0   |
| 95°    | 56.7   | 67.7   | 69.5   | 69.5   | 67.7   |
| 97.5°  | 94.4   | 104.5  | 108.8  | 108.8  | 108.8  |
| 100°   | 137.9  | 146.9  | 150.0  | 150.0  | 148.9  |
| 102.5° | 183.8  | 190.5  | 194.7  | 195.9  | 194.7  |
| 105°   | 234.0  | 237.1  | 239.5  | 241.3  | 241.3  |
| 107.5° | 283.7  | 288.4  | 288.4  | 289.2  | 283.7  |
| 110°   | 331.9  | 338.2  | 338.2  | 338.2  | 335.0  |

TEST NUMBER: P917042

CATALOG NUMBER: DFN2DIP-PN4F0-110D050US930-RLFL

**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 384.0  | 390.6  | 389.5  | 386.4  | 384.0  |
| 115°   | 435.3  | 441.6  | 439.6  | 438.5  | 435.3  |
| 117.5° | 486.2  | 494.8  | 489.3  | 486.2  | 483.1  |
| 120°   | 537.5  | 546.1  | 537.5  | 537.5  | 534.0  |
| 122.5° | 584.2  | 595.1  | 589.6  | 586.5  | 584.2  |
| 125°   | 633.2  | 642.9  | 639.8  | 636.3  | 635.1  |
| 127.5° | 680.9  | 693.0  | 688.8  | 684.0  | 680.9  |
| 130°   | 725.7  | 739.6  | 737.7  | 735.4  | 731.1  |
| 132.5° | 775.8  | 786.7  | 787.5  | 782.0  | 778.9  |
| 135°   | 819.0  | 831.0  | 833.3  | 832.2  | 829.1  |
| 137.5° | 867.2  | 876.9  | 878.8  | 878.0  | 873.3  |
| 140°   | 909.5  | 919.2  | 924.6  | 924.6  | 920.4  |
| 142.5° | 953.0  | 962.8  | 965.9  | 967.0  | 962.8  |
| 145°   | 994.3  | 1002.0 | 1008.2 | 1009.4 | 1005.1 |
| 147.5° | 1031.2 | 1040.9 | 1045.5 | 1047.5 | 1043.2 |
| 150°   | 1069.3 | 1075.9 | 1080.1 | 1083.6 | 1080.1 |
| 152.5° | 1103.1 | 1109.7 | 1115.1 | 1119.4 | 1115.1 |
| 155°   | 1136.9 | 1140.0 | 1143.5 | 1148.9 | 1145.4 |
| 157.5° | 1166.0 | 1168.3 | 1170.3 | 1178.1 | 1172.6 |
| 160°   | 1192.0 | 1194.4 | 1195.6 | 1202.2 | 1197.5 |
| 162.5° | 1216.2 | 1216.2 | 1217.3 | 1224.7 | 1219.3 |
| 165°   | 1236.8 | 1235.6 | 1235.6 | 1243.4 | 1237.9 |
| 167.5° | 1255.4 | 1251.9 | 1251.9 | 1259.7 | 1254.3 |
| 170°   | 1269.4 | 1266.3 | 1265.2 | 1272.9 | 1266.3 |
| 172.5° | 1279.1 | 1276.0 | 1274.9 | 1282.6 | 1276.0 |
| 175°   | 1286.9 | 1283.8 | 1281.5 | 1289.2 | 1282.6 |
| 177.5° | 1291.2 | 1288.1 | 1285.7 | 1292.3 | 1285.7 |
| 180°   | 1289.2 | 1289.2 | 1289.2 | 1289.2 | 1289.2 |

TEST NUMBER: P917042

CATALOG NUMBER: DFN2DIP-PN4F0-110D050US930-RLFL

**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 | 12.14            | 13.14 | 12.93 | 13.95 | 14.95 | 8.11           | 9.11  | 8.90  | 9.92  | 10.91 |
|                 | 3H   | 13.83            | 14.73 | 14.64 | 15.55 | 16.57 | 9.31           | 10.20 | 10.12 | 11.02 | 12.05 |
|                 | 4H   | 14.45            | 15.30 | 15.28 | 16.13 | 17.16 | 9.77           | 10.61 | 10.59 | 11.44 | 12.47 |
|                 | 6H   | 14.88            | 15.66 | 15.72 | 16.50 | 17.55 | 10.10          | 10.87 | 10.93 | 11.71 | 12.76 |
|                 | 8H   | 15.02            | 15.76 | 15.86 | 16.61 | 17.66 | 10.19          | 10.93 | 11.04 | 11.79 | 12.84 |
|                 | 12H  | 15.09            | 15.79 | 15.94 | 16.64 | 17.71 | 10.24          | 10.95 | 11.09 | 11.80 | 12.87 |
| 4H              | 2H   | 12.18            | 13.02 | 13.01 | 13.85 | 14.89 | 8.72           | 9.57  | 9.55  | 10.40 | 11.43 |
|                 | 3H   | 14.03            | 14.73 | 14.87 | 15.59 | 16.64 | 10.09          | 10.79 | 10.93 | 11.65 | 12.70 |
|                 | 4H   | 14.73            | 15.37 | 15.58 | 16.23 | 17.30 | 10.65          | 11.28 | 11.50 | 12.14 | 13.22 |
|                 | 6H   | 15.26            | 15.80 | 16.12 | 16.69 | 17.77 | 11.07          | 11.62 | 11.94 | 12.51 | 13.59 |
|                 | 8H   | 15.44            | 15.95 | 16.31 | 16.83 | 17.92 | 11.21          | 11.72 | 12.08 | 12.60 | 13.69 |
|                 | 12H  | 15.54            | 16.00 | 16.43 | 16.90 | 18.00 | 11.28          | 11.74 | 12.17 | 12.64 | 13.74 |
| 8H              | 4H   | 14.71            | 15.22 | 15.58 | 16.10 | 17.19 | 10.94          | 11.45 | 11.81 | 12.33 | 13.43 |
|                 | 6H   | 15.28            | 15.71 | 16.18 | 16.63 | 17.72 | 11.47          | 11.89 | 12.36 | 12.81 | 13.90 |
|                 | 8H   | 15.50            | 15.88 | 16.41 | 16.79 | 17.90 | 11.66          | 12.03 | 12.57 | 12.95 | 14.06 |
|                 | 12H  | 15.65            | 15.98 | 16.56 | 16.89 | 18.05 | 11.79          | 12.12 | 12.70 | 13.02 | 14.19 |
| 12H             | 4H   | 14.67            | 15.13 | 15.56 | 16.03 | 17.13 | 10.95          | 11.41 | 11.84 | 12.31 | 13.41 |
|                 | 6H   | 15.26            | 15.64 | 16.17 | 16.55 | 17.66 | 11.52          | 11.89 | 12.43 | 12.81 | 13.92 |
|                 | 8H   | 15.49            | 15.82 | 16.40 | 16.73 | 17.89 | 11.74          | 12.07 | 12.65 | 12.97 | 14.14 |