

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: P918480

Luminaire Tested: DFN2DIP-TR4F0-120D060US930-RLFL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P918480  
REPORT IS A COMBINATION OF REPORTS P900422 AND P897293  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-TR4F0-120D060US930-RLLFLL  
Description: 4 foot, Triangle Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

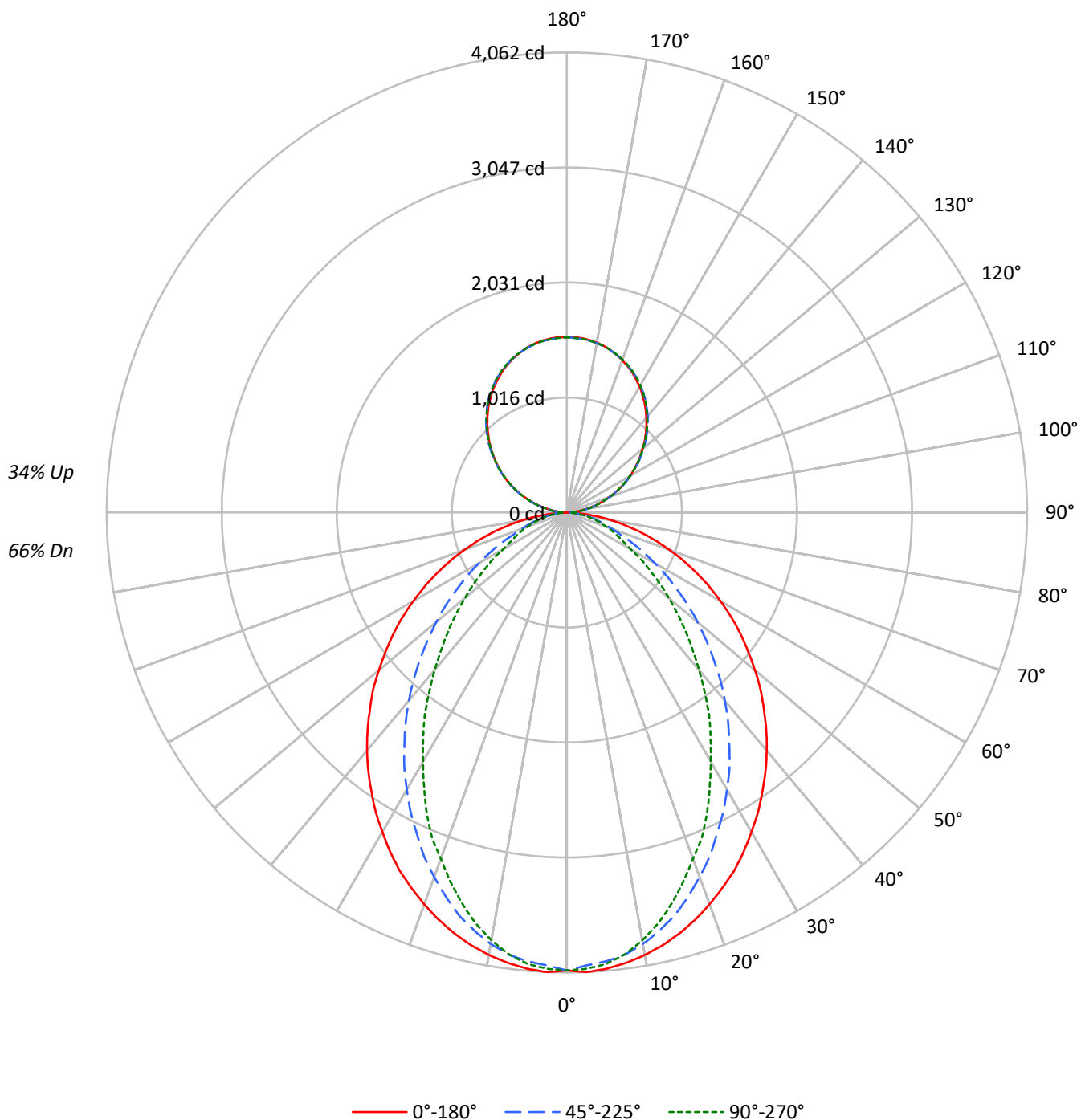
Lumens per Lamp: N/A  
Luminaire Lumens: 12645.3 lumens  
Efficiency: N/A  
Efficacy: 74.2 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 0.99 / 1.16  
Luminous Opening: Rectangular w/ Sides (W: 3.43' x L: 3.96' x H: 0.1')  
CIE Type: Semi-Direct

Input Watts (W): 170.4  
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



TEST NUMBER: P918480

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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 | 104 | 104 | 104 | 104 | 92 | 92 | 92 | 81 | 81 | 81 | 71 | 71 | 71 |
| 1   | 102 | 98  | 94  | 91  | 96  | 92  | 89  | 86  | 82 | 79 | 77 | 72 | 70 | 69 | 63 | 62 | 61 |
| 2   | 93  | 86  | 80  | 75  | 88  | 81  | 76  | 72  | 72 | 68 | 65 | 64 | 61 | 58 | 57 | 54 | 52 |
| 3   | 86  | 76  | 69  | 63  | 80  | 72  | 66  | 61  | 65 | 59 | 55 | 57 | 53 | 50 | 51 | 48 | 45 |
| 4   | 79  | 68  | 60  | 54  | 74  | 65  | 58  | 52  | 58 | 52 | 48 | 52 | 47 | 44 | 46 | 42 | 40 |
| 5   | 73  | 61  | 53  | 47  | 68  | 58  | 51  | 45  | 52 | 46 | 42 | 47 | 42 | 38 | 42 | 38 | 35 |
| 6   | 67  | 55  | 47  | 41  | 63  | 52  | 45  | 40  | 47 | 41 | 37 | 42 | 38 | 34 | 38 | 34 | 31 |
| 7   | 62  | 50  | 42  | 37  | 59  | 48  | 40  | 35  | 43 | 37 | 33 | 39 | 34 | 30 | 35 | 31 | 28 |
| 8   | 58  | 46  | 38  | 33  | 55  | 44  | 37  | 32  | 40 | 34 | 29 | 36 | 31 | 27 | 32 | 28 | 25 |
| 9   | 54  | 42  | 35  | 29  | 51  | 40  | 33  | 29  | 36 | 31 | 27 | 33 | 28 | 25 | 30 | 26 | 23 |
| 10  | 51  | 39  | 31  | 27  | 48  | 37  | 30  | 26  | 34 | 28 | 24 | 31 | 26 | 23 | 28 | 24 | 21 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 3212 | 3212 | 3212 |
| 5°  | 3218 | 3161 | 3182 |
| 10° | 3186 | 3099 | 3078 |
| 15° | 3142 | 2997 | 2918 |
| 20° | 3084 | 2856 | 2721 |
| 25° | 3025 | 2697 | 2531 |
| 30° | 2945 | 2535 | 2291 |
| 35° | 2867 | 2360 | 2080 |
| 40° | 2787 | 2180 | 1837 |
| 45° | 2695 | 1980 | 1618 |
| 50° | 2599 | 1777 | 1403 |
| 55° | 2500 | 1561 | 1197 |
| 60° | 2384 | 1335 | 985  |
| 65° | 2251 | 1106 | 887  |
| 70° | 2090 | 891  | 802  |
| 75° | 1888 | 786  | 730  |
| 80° | 1596 | 659  | 632  |
| 85° | 1112 | 440  | 475  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 2695 cd/sqm

TEST NUMBER: P918480

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 379.0   | 3.0       |
| 10°-20°   | 1040.3  | 8.2       |
| 20°-30°   | 1460.6  | 11.6      |
| 30°-40°   | 1592.1  | 12.6      |
| 40°-50°   | 1463.4  | 11.6      |
| 50°-60°   | 1149.2  | 9.1       |
| 60°-70°   | 748.0   | 5.9       |
| 70°-80°   | 385.1   | 3.0       |
| 80°-90°   | 102.7   | 0.8       |
| 90°-100°  | 95.7    | 0.8       |
| 100°-110° | 304.2   | 2.4       |
| 110°-120° | 520.6   | 4.1       |
| 120°-130° | 684.6   | 5.4       |
| 130°-140° | 768.4   | 6.1       |
| 140°-150° | 753.5   | 6.0       |
| 150°-160° | 632.1   | 5.0       |
| 160°-170° | 419.2   | 3.3       |
| 170°-180° | 146.5   | 1.2       |
| 0°-30°    | 2879.9  | 22.8      |
| 0°-40°    | 4472.0  | 35.4      |
| 0°-60°    | 7084.6  | 56.0      |
| 0°-90°    | 8320.4  | 65.8      |
| 90°-120°  | 920.5   | 7.3       |
| 90°-150°  | 3127.0  | 24.7      |
| 90°-180°  | 4325.0  | 34.2      |
| 0°-180°   | 12645.3 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 4044 | 4044  | 4044 | 4044  | 4044 |      |
| 5°   | 4044 | 4025  | 3978 | 4010  | 4000 | 383  |
| 15°  | 3846 | 3806  | 3681 | 3612  | 3575 | 1084 |
| 25°  | 3491 | 3374  | 3132 | 2982  | 2927 | 1606 |
| 35°  | 3008 | 2821  | 2500 | 2269  | 2188 | 1883 |
| 45°  | 2459 | 2214  | 1830 | 1570  | 1482 | 1899 |
| 55°  | 1870 | 1584  | 1189 | 970   | 900  | 1671 |
| 65°  | 1263 | 966   | 637  | 512   | 501  | 1252 |
| 75°  | 673  | 417   | 293  | 267   | 264  | 712  |
| 85°  | 157  | 80    | 70   | 70    | 70   | 181  |
| 90°  | 1    | 17    | 46   | 43    | 44   | 12   |
| 95°  | 68   | 81    | 84   | 84    | 81   | 76   |
| 105° | 281  | 284   | 287  | 290   | 290  | 296  |
| 115° | 522  | 530   | 528  | 526   | 522  | 517  |
| 125° | 760  | 771   | 768  | 764   | 762  | 679  |
| 135° | 983  | 997   | 1000 | 999   | 995  | 760  |
| 145° | 1193 | 1202  | 1210 | 1211  | 1206 | 745  |
| 155° | 1364 | 1368  | 1372 | 1379  | 1374 | 628  |
| 165° | 1484 | 1483  | 1483 | 1492  | 1486 | 419  |
| 175° | 1544 | 1541  | 1538 | 1547  | 1539 | 147  |
| 180° | 1547 | 1547  | 1547 | 1547  | 1547 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 4043.6 | 4043.6 | 4043.6 | 4043.6 | 4043.6 |
| 2.5°   | 4061.8 | 4043.6 | 4003.2 | 4040.0 | 4032.6 |
| 5°     | 4043.6 | 4025.3 | 3977.5 | 4010.5 | 3999.7 |
| 7.5°   | 4010.5 | 3988.8 | 3937.6 | 3951.9 | 3933.7 |
| 10°    | 3966.7 | 3941.1 | 3868.0 | 3856.8 | 3835.1 |
| 12.5°  | 3911.9 | 3878.9 | 3779.9 | 3758.2 | 3717.8 |
| 15°    | 3845.9 | 3805.6 | 3681.3 | 3611.8 | 3575.3 |
| 17.5°  | 3769.0 | 3710.4 | 3556.7 | 3476.4 | 3417.7 |
| 20°    | 3681.3 | 3607.9 | 3425.1 | 3333.8 | 3253.0 |
| 22.5°  | 3586.2 | 3502.0 | 3289.6 | 3165.3 | 3110.6 |
| 25°    | 3491.1 | 3373.8 | 3132.3 | 2982.4 | 2927.3 |
| 27.5°  | 3377.7 | 3253.0 | 2985.9 | 2814.0 | 2729.7 |
| 30°    | 3257.0 | 3117.6 | 2824.8 | 2638.5 | 2539.5 |
| 32.5°  | 3139.7 | 2971.2 | 2671.5 | 2451.8 | 2360.1 |
| 35°    | 3008.1 | 2821.3 | 2499.5 | 2268.9 | 2188.1 |
| 37.5°  | 2880.0 | 2678.5 | 2338.4 | 2085.6 | 1994.4 |
| 40°    | 2744.5 | 2525.1 | 2169.9 | 1910.2 | 1815.0 |
| 42.5°  | 2605.4 | 2371.4 | 2001.8 | 1730.8 | 1639.6 |
| 45°    | 2459.1 | 2213.8 | 1829.8 | 1569.7 | 1481.9 |
| 47.5°  | 2320.1 | 2060.4 | 1665.2 | 1405.1 | 1324.7 |
| 50°    | 2166.4 | 1906.7 | 1504.1 | 1251.3 | 1174.8 |
| 52.5°  | 2016.2 | 1741.6 | 1350.3 | 1108.8 | 1039.3 |
| 55°    | 1869.8 | 1584.5 | 1189.2 | 969.8  | 900.3  |
| 57.5°  | 1719.9 | 1427.2 | 1046.7 | 841.7  | 783.1  |
| 60°    | 1566.2 | 1273.4 | 896.4  | 710.1  | 651.5  |
| 62.5°  | 1416.3 | 1123.6 | 768.3  | 592.9  | 563.7  |
| 65°    | 1262.6 | 966.0  | 636.7  | 512.5  | 501.2  |
| 67.5°  | 1116.2 | 819.5  | 512.5  | 450.0  | 439.1  |
| 70°    | 962.5  | 677.1  | 424.4  | 387.8  | 373.1  |
| 72.5°  | 816.1  | 545.1  | 354.8  | 325.7  | 318.4  |
| 75°    | 673.2  | 416.9  | 292.8  | 267.1  | 263.6  |
| 77.5°  | 530.8  | 296.2  | 230.6  | 215.9  | 208.5  |
| 80°    | 398.8  | 212.4  | 175.5  | 161.1  | 161.1  |
| 82.5°  | 278.0  | 142.8  | 120.7  | 113.3  | 113.3  |
| 85°    | 157.3  | 80.4   | 69.5   | 69.5   | 69.5   |
| 87.5°  | 58.6   | 29.1   | 29.1   | 25.6   | 25.6   |
| 90°    | 1.4    | 16.8   | 45.7   | 42.9   | 44.3   |
| 92.5°  | 28.9   | 39.2   | 40.6   | 42.0   | 42.0   |
| 95°    | 68.1   | 81.1   | 83.5   | 83.5   | 81.1   |
| 97.5°  | 113.3  | 125.5  | 130.6  | 130.6  | 130.6  |
| 100°   | 165.6  | 176.3  | 180.0  | 180.0  | 178.6  |
| 102.5° | 220.6  | 228.5  | 233.7  | 235.1  | 233.7  |
| 105°   | 280.8  | 284.5  | 287.3  | 289.7  | 289.7  |
| 107.5° | 340.5  | 346.1  | 346.1  | 347.0  | 340.5  |
| 110°   | 398.4  | 405.8  | 405.8  | 405.8  | 402.0  |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 460.8  | 468.7  | 467.3  | 463.6  | 460.8  |
| 115°   | 522.4  | 529.9  | 527.5  | 526.1  | 522.4  |
| 117.5° | 583.5  | 593.8  | 587.2  | 583.5  | 579.8  |
| 120°   | 645.1  | 655.3  | 645.1  | 645.1  | 640.8  |
| 122.5° | 701.0  | 714.0  | 707.5  | 703.8  | 701.0  |
| 125°   | 759.8  | 771.4  | 767.7  | 763.5  | 762.1  |
| 127.5° | 817.2  | 831.6  | 826.5  | 820.9  | 817.2  |
| 130°   | 870.8  | 887.6  | 885.3  | 882.5  | 877.3  |
| 132.5° | 931.0  | 944.0  | 944.9  | 938.4  | 934.7  |
| 135°   | 982.8  | 997.2  | 1000.0 | 998.6  | 994.8  |
| 137.5° | 1040.6 | 1052.2 | 1054.6 | 1053.6 | 1048.1 |
| 140°   | 1091.4 | 1103.1 | 1109.6 | 1109.6 | 1104.5 |
| 142.5° | 1143.6 | 1155.3 | 1159.0 | 1160.4 | 1155.3 |
| 145°   | 1193.1 | 1202.4 | 1209.9 | 1211.3 | 1206.2 |
| 147.5° | 1237.4 | 1249.0 | 1254.7 | 1256.9 | 1251.8 |
| 150°   | 1283.1 | 1291.0 | 1296.2 | 1300.3 | 1296.2 |
| 152.5° | 1323.6 | 1331.6 | 1338.1 | 1343.3 | 1338.1 |
| 155°   | 1364.2 | 1368.0 | 1372.1 | 1378.8 | 1374.5 |
| 157.5° | 1399.2 | 1402.1 | 1404.4 | 1413.7 | 1407.2 |
| 160°   | 1430.5 | 1433.3 | 1434.7 | 1442.6 | 1437.0 |
| 162.5° | 1459.4 | 1459.4 | 1460.8 | 1469.7 | 1463.1 |
| 165°   | 1484.1 | 1482.7 | 1482.7 | 1492.1 | 1485.6 |
| 167.5° | 1506.5 | 1502.4 | 1502.4 | 1511.6 | 1505.1 |
| 170°   | 1523.3 | 1519.6 | 1518.2 | 1527.5 | 1519.6 |
| 172.5° | 1535.0 | 1531.2 | 1529.8 | 1539.1 | 1531.2 |
| 175°   | 1544.3 | 1540.6 | 1537.7 | 1547.1 | 1539.1 |
| 177.5° | 1549.4 | 1545.7 | 1542.9 | 1550.8 | 1542.9 |
| 180°   | 1547.1 | 1547.1 | 1547.1 | 1547.1 | 1547.1 |

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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 | 12.56            | 13.54 | 13.37 | 14.37 | 15.40 | 8.53           | 9.51  | 9.35  | 10.34 | 11.37 |
|                 | 3H   | 14.25            | 15.12 | 15.07 | 15.96 | 17.02 | 9.73           | 10.61 | 10.56 | 11.45 | 12.51 |
|                 | 4H   | 14.86            | 15.69 | 15.71 | 16.54 | 17.60 | 10.19          | 11.01 | 11.03 | 11.86 | 12.93 |
|                 | 6H   | 15.29            | 16.05 | 16.15 | 16.91 | 17.99 | 10.52          | 11.28 | 11.38 | 12.14 | 13.22 |
|                 | 8H   | 15.42            | 16.14 | 16.29 | 17.02 | 18.10 | 10.61          | 11.34 | 11.48 | 12.21 | 13.29 |
|                 | 12H  | 15.49            | 16.17 | 16.36 | 17.04 | 18.15 | 10.66          | 11.35 | 11.53 | 12.22 | 13.33 |
| 4H              | 2H   | 12.59            | 13.42 | 13.44 | 14.27 | 15.34 | 9.14           | 9.97  | 9.99  | 10.82 | 11.89 |
|                 | 3H   | 14.44            | 15.12 | 15.30 | 16.00 | 17.09 | 10.51          | 11.19 | 11.37 | 12.08 | 13.16 |
|                 | 4H   | 15.13            | 15.76 | 16.01 | 16.64 | 17.75 | 11.06          | 11.69 | 11.94 | 12.57 | 13.68 |
|                 | 6H   | 15.66            | 16.19 | 16.55 | 17.10 | 18.21 | 11.49          | 12.03 | 12.38 | 12.93 | 14.05 |
|                 | 8H   | 15.83            | 16.34 | 16.73 | 17.23 | 18.36 | 11.62          | 12.12 | 12.51 | 13.02 | 14.15 |
|                 | 12H  | 15.94            | 16.39 | 16.85 | 17.30 | 18.44 | 11.70          | 12.15 | 12.61 | 13.06 | 14.20 |
| 8H              | 4H   | 15.11            | 15.61 | 16.00 | 16.51 | 17.64 | 11.35          | 11.85 | 12.25 | 12.75 | 13.88 |
|                 | 6H   | 15.68            | 16.10 | 16.60 | 17.04 | 18.16 | 11.88          | 12.29 | 12.80 | 13.23 | 14.36 |
|                 | 8H   | 15.90            | 16.27 | 16.83 | 17.20 | 18.34 | 12.07          | 12.44 | 13.00 | 13.37 | 14.51 |
|                 | 12H  | 16.05            | 16.37 | 16.98 | 17.29 | 18.49 | 12.20          | 12.52 | 13.13 | 13.44 | 14.64 |
| 12H             | 4H   | 15.07            | 15.52 | 15.98 | 16.44 | 17.57 | 11.36          | 11.82 | 12.28 | 12.73 | 13.87 |
|                 | 6H   | 15.66            | 16.03 | 16.59 | 16.96 | 18.10 | 11.93          | 12.29 | 12.86 | 13.23 | 14.37 |
|                 | 8H   | 15.89            | 16.21 | 16.82 | 17.13 | 18.33 | 12.15          | 12.47 | 13.08 | 13.39 | 14.59 |