

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: P906127

Luminaire Tested: DFN2DIP-PN4F0-110D040US835-RLLONL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P906127  
REPORT IS A COMBINATION OF REPORTS P901144 AND P898053  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-PN4F0-110D040US835-RLLONL  
Description: 4 foot, Pentagon Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

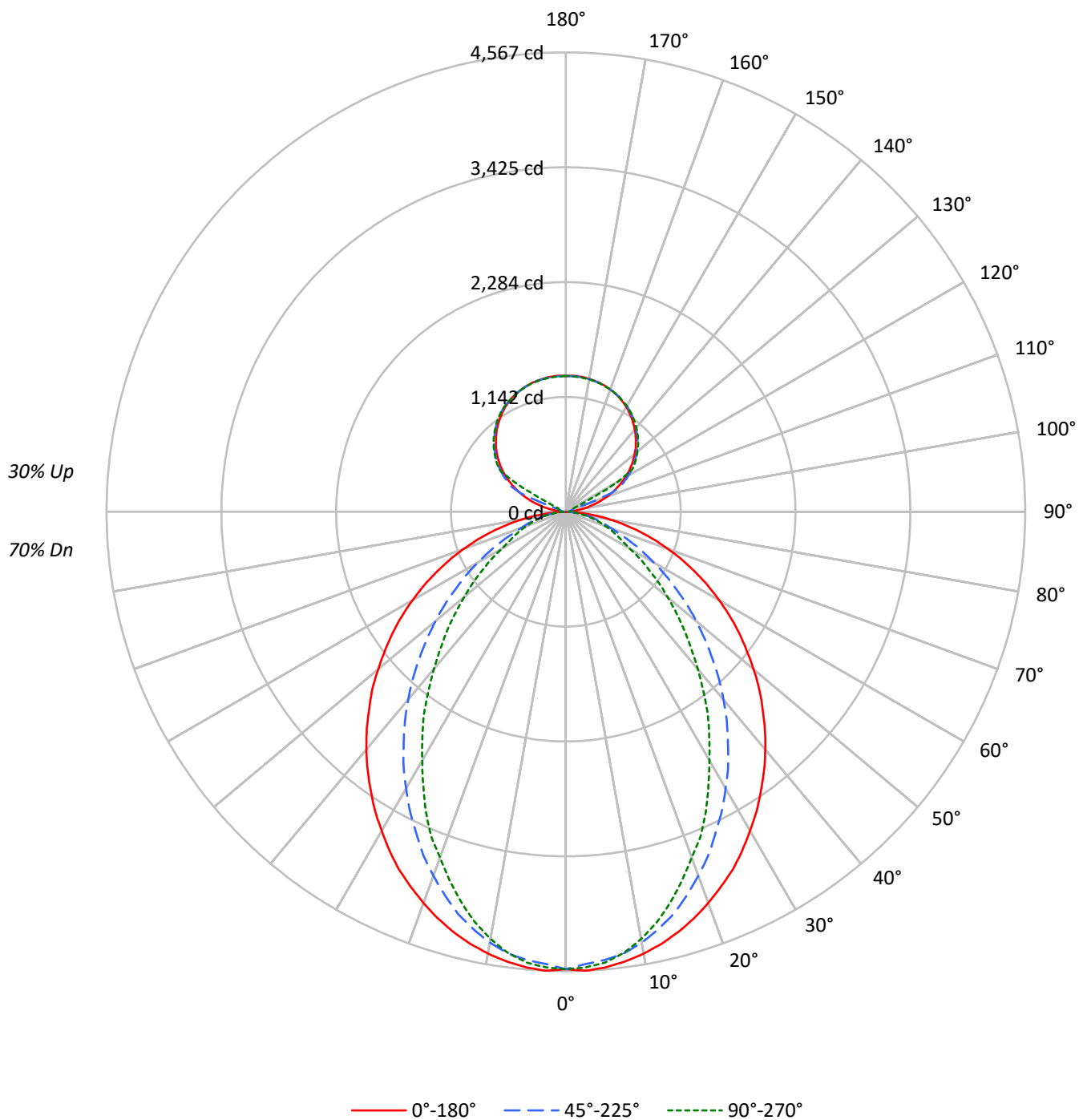
**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 13310.0 lumens  
Efficiency: N/A  
Efficacy: 92.0 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): 144.6  
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   | 112 | 112 | 112 | 112 | 106 | 106 | 106 | 106 | 95 | 95 | 95 | 84 | 84 | 84 | 75 | 75 | 75 |
| 1   | 103 | 99  | 95  | 92  | 97  | 94  | 90  | 87  | 84 | 82 | 79 | 75 | 73 | 72 | 67 | 66 | 64 |
| 2   | 94  | 87  | 81  | 76  | 89  | 83  | 77  | 73  | 75 | 70 | 67 | 67 | 64 | 61 | 60 | 58 | 55 |
| 3   | 87  | 77  | 70  | 64  | 82  | 73  | 67  | 62  | 66 | 61 | 57 | 60 | 56 | 52 | 54 | 51 | 48 |
| 4   | 80  | 69  | 61  | 55  | 75  | 66  | 59  | 53  | 60 | 54 | 49 | 54 | 49 | 46 | 48 | 45 | 42 |
| 5   | 73  | 62  | 54  | 48  | 69  | 59  | 52  | 46  | 54 | 48 | 43 | 49 | 44 | 40 | 44 | 40 | 37 |
| 6   | 68  | 56  | 48  | 42  | 64  | 53  | 46  | 41  | 49 | 43 | 38 | 44 | 39 | 35 | 40 | 36 | 33 |
| 7   | 63  | 51  | 43  | 37  | 60  | 49  | 41  | 36  | 44 | 38 | 34 | 41 | 36 | 32 | 37 | 33 | 30 |
| 8   | 59  | 46  | 39  | 33  | 56  | 45  | 37  | 32  | 41 | 35 | 30 | 37 | 32 | 29 | 34 | 30 | 27 |
| 9   | 55  | 43  | 35  | 30  | 52  | 41  | 34  | 29  | 38 | 32 | 28 | 35 | 30 | 26 | 32 | 27 | 24 |
| 10  | 52  | 39  | 32  | 27  | 49  | 38  | 31  | 27  | 35 | 29 | 25 | 32 | 27 | 24 | 29 | 25 | 22 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 3319 | 3319 | 3319 |
| 5°  | 3324 | 3266 | 3287 |
| 10° | 3291 | 3203 | 3181 |
| 15° | 3246 | 3097 | 3016 |
| 20° | 3186 | 2952 | 2814 |
| 25° | 3124 | 2789 | 2618 |
| 30° | 3042 | 2621 | 2370 |
| 35° | 2961 | 2441 | 2152 |
| 40° | 2879 | 2255 | 1902 |
| 45° | 2784 | 2048 | 1675 |
| 50° | 2685 | 1840 | 1454 |
| 55° | 2582 | 1616 | 1241 |
| 60° | 2462 | 1383 | 1022 |
| 65° | 2325 | 1146 | 921  |
| 70° | 2159 | 925  | 834  |
| 75° | 1950 | 816  | 760  |
| 80° | 1647 | 686  | 662  |
| 85° | 1148 | 460  | 501  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 2784 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 426.1   | 3.2       |
| 10°-20°   | 1169.7  | 8.8       |
| 20°-30°   | 1642.2  | 12.3      |
| 30°-40°   | 1790.1  | 13.4      |
| 40°-50°   | 1645.3  | 12.4      |
| 50°-60°   | 1292.1  | 9.7       |
| 60°-70°   | 841.1   | 6.3       |
| 70°-80°   | 432.9   | 3.3       |
| 80°-90°   | 112.9   | 0.8       |
| 90°-100°  | 44.5    | 0.3       |
| 100°-110° | 165.9   | 1.2       |
| 110°-120° | 440.1   | 3.3       |
| 120°-130° | 729.9   | 5.5       |
| 130°-140° | 775.4   | 5.8       |
| 140°-150° | 720.6   | 5.4       |
| 150°-160° | 579.4   | 4.4       |
| 160°-170° | 373.3   | 2.8       |
| 170°-180° | 128.5   | 1.0       |
| 0°-30°    | 3238.0  | 24.3      |
| 0°-40°    | 5028.1  | 37.8      |
| 0°-60°    | 7965.5  | 59.8      |
| 0°-90°    | 9352.4  | 70.3      |
| 90°-120°  | 650.5   | 4.9       |
| 90°-150°  | 2876.4  | 21.6      |
| 90°-180°  | 3958.0  | 29.7      |
| 0°-180°   | 13310.0 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 4546 | 4546  | 4546 | 4546  | 4546 |      |
| 5°   | 4546 | 4526  | 4472 | 4509  | 4497 | 431  |
| 15°  | 4324 | 4279  | 4139 | 4061  | 4020 | 1218 |
| 25°  | 3925 | 3793  | 3522 | 3353  | 3291 | 1805 |
| 35°  | 3382 | 3172  | 2810 | 2551  | 2460 | 2117 |
| 45°  | 2765 | 2489  | 2057 | 1765  | 1666 | 2135 |
| 55°  | 2102 | 1781  | 1337 | 1090  | 1012 | 1879 |
| 65°  | 1420 | 1086  | 716  | 576   | 564  | 1407 |
| 75°  | 757  | 469   | 329  | 300   | 296  | 801  |
| 85°  | 177  | 90    | 78   | 78    | 78   | 203  |
| 90°  | 1    | 12    | 20   | 24    | 26   | 13   |
| 95°  | 63   | 31    | 38   | 43    | 42   | 75   |
| 105° | 297  | 326   | 60   | 70    | 74   | 317  |
| 115° | 562  | 578   | 603  | 150   | 80   | 553  |
| 125° | 794  | 807   | 825  | 832   | 835  | 708  |
| 135° | 983  | 998   | 1007 | 1017  | 1015 | 759  |
| 145° | 1140 | 1139  | 1156 | 1162  | 1158 | 713  |
| 155° | 1255 | 1246  | 1258 | 1264  | 1256 | 578  |
| 165° | 1323 | 1317  | 1320 | 1326  | 1320 | 374  |
| 175° | 1353 | 1346  | 1348 | 1355  | 1345 | 129  |
| 180° | 1350 | 1350  | 1350 | 1350  | 1350 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 4546.3 | 4546.3 | 4546.3 | 4546.3 | 4546.3 |
| 2.5°   | 4566.8 | 4546.3 | 4500.9 | 4542.4 | 4534.1 |
| 5°     | 4546.3 | 4525.8 | 4472.1 | 4509.2 | 4497.0 |
| 7.5°   | 4509.2 | 4484.7 | 4427.1 | 4443.3 | 4422.7 |
| 10°    | 4459.9 | 4431.0 | 4349.0 | 4336.3 | 4311.9 |
| 12.5°  | 4398.3 | 4361.2 | 4249.9 | 4225.4 | 4180.0 |
| 15°    | 4324.1 | 4278.7 | 4139.0 | 4060.9 | 4019.8 |
| 17.5°  | 4237.7 | 4171.8 | 3998.9 | 3908.5 | 3842.6 |
| 20°    | 4139.0 | 4056.5 | 3850.9 | 3748.3 | 3657.5 |
| 22.5°  | 4032.1 | 3937.3 | 3698.6 | 3558.9 | 3497.3 |
| 25°    | 3925.1 | 3793.3 | 3521.8 | 3353.3 | 3291.3 |
| 27.5°  | 3797.7 | 3657.5 | 3357.2 | 3163.8 | 3069.1 |
| 30°    | 3661.9 | 3505.2 | 3176.1 | 2966.5 | 2855.2 |
| 32.5°  | 3530.1 | 3340.6 | 3003.6 | 2756.6 | 2653.6 |
| 35°    | 3382.1 | 3172.1 | 2810.3 | 2551.0 | 2460.2 |
| 37.5°  | 3238.1 | 3011.5 | 2629.1 | 2344.9 | 2242.4 |
| 40°    | 3085.7 | 2839.1 | 2439.7 | 2147.6 | 2040.7 |
| 42.5°  | 2929.4 | 2666.2 | 2250.7 | 1946.0 | 1843.4 |
| 45°    | 2764.9 | 2489.0 | 2057.3 | 1764.8 | 1666.2 |
| 47.5°  | 2608.6 | 2316.6 | 1872.2 | 1579.7 | 1489.4 |
| 50°    | 2435.7 | 2143.7 | 1691.1 | 1406.9 | 1320.9 |
| 52.5°  | 2266.8 | 1958.2 | 1518.2 | 1246.7 | 1168.5 |
| 55°    | 2102.2 | 1781.4 | 1337.0 | 1090.4 | 1012.3 |
| 57.5°  | 1933.8 | 1604.6 | 1176.8 | 946.4  | 880.4  |
| 60°    | 1760.9 | 1431.8 | 1007.9 | 798.4  | 732.5  |
| 62.5°  | 1592.4 | 1263.3 | 863.9  | 666.6  | 633.8  |
| 65°    | 1419.5 | 1086.0 | 715.9  | 576.2  | 563.5  |
| 67.5°  | 1255.0 | 921.5  | 576.2  | 505.9  | 493.7  |
| 70°    | 1082.1 | 761.3  | 477.1  | 436.1  | 419.5  |
| 72.5°  | 917.5  | 612.9  | 399.0  | 366.2  | 357.9  |
| 75°    | 756.9  | 468.8  | 329.1  | 300.3  | 296.4  |
| 77.5°  | 596.7  | 333.1  | 259.3  | 242.7  | 234.4  |
| 80°    | 448.3  | 238.8  | 197.3  | 181.2  | 181.2  |
| 82.5°  | 312.5  | 160.6  | 135.8  | 127.5  | 127.5  |
| 85°    | 176.8  | 90.4   | 78.1   | 78.1   | 78.1   |
| 87.5°  | 65.9   | 32.7   | 32.7   | 28.8   | 28.8   |
| 90°    | 0.9    | 11.7   | 19.5   | 24.5   | 26.3   |
| 92.5°  | 24.5   | 20.5   | 23.4   | 25.4   | 26.3   |
| 95°    | 63.4   | 31.2   | 38.0   | 43.0   | 42.0   |
| 97.5°  | 114.3  | 34.2   | 49.8   | 52.8   | 53.7   |
| 100°   | 172.9  | 39.1   | 55.7   | 63.4   | 65.4   |
| 102.5° | 237.3  | 235.5  | 57.6   | 68.3   | 71.3   |
| 105°   | 296.9  | 326.3  | 59.6   | 70.3   | 74.2   |
| 107.5° | 366.3  | 390.7  | 61.6   | 72.3   | 76.2   |
| 110°   | 432.8  | 453.2  | 171.0  | 73.3   | 77.1   |



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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 495.3  | 512.8  | 496.2  | 75.2   | 78.2   |
| 115°   | 561.6  | 578.2  | 602.7  | 150.4  | 80.2   |
| 117.5° | 619.3  | 638.8  | 655.5  | 515.7  | 259.8  |
| 120°   | 683.8  | 698.4  | 716.0  | 727.8  | 595.9  |
| 122.5° | 738.4  | 754.1  | 773.7  | 779.5  | 780.5  |
| 125°   | 794.1  | 806.9  | 825.4  | 832.3  | 835.2  |
| 127.5° | 844.9  | 858.6  | 873.3  | 883.1  | 884.0  |
| 130°   | 892.8  | 908.5  | 919.1  | 929.9  | 929.0  |
| 132.5° | 941.6  | 954.4  | 965.1  | 973.9  | 973.0  |
| 135°   | 982.7  | 998.4  | 1007.1 | 1016.9 | 1015.0 |
| 137.5° | 1025.6 | 1037.3 | 1047.2 | 1056.9 | 1054.0 |
| 140°   | 1067.6 | 1075.5 | 1086.2 | 1095.0 | 1090.1 |
| 142.5° | 1102.9 | 1109.7 | 1122.4 | 1130.1 | 1125.3 |
| 145°   | 1140.0 | 1139.0 | 1155.5 | 1162.4 | 1157.5 |
| 147.5° | 1172.1 | 1169.2 | 1185.8 | 1190.7 | 1186.9 |
| 150°   | 1203.4 | 1196.6 | 1212.3 | 1218.1 | 1213.2 |
| 152.5° | 1229.8 | 1222.0 | 1236.6 | 1242.5 | 1235.7 |
| 155°   | 1255.2 | 1246.5 | 1258.2 | 1264.0 | 1256.2 |
| 157.5° | 1275.7 | 1267.9 | 1276.8 | 1283.6 | 1275.7 |
| 160°   | 1293.3 | 1287.4 | 1293.3 | 1299.1 | 1292.3 |
| 162.5° | 1308.9 | 1303.1 | 1308.0 | 1314.8 | 1306.0 |
| 165°   | 1322.6 | 1316.8 | 1319.7 | 1326.5 | 1319.7 |
| 167.5° | 1333.4 | 1327.4 | 1330.5 | 1337.3 | 1328.5 |
| 170°   | 1342.2 | 1336.3 | 1338.2 | 1345.1 | 1336.3 |
| 172.5° | 1348.0 | 1342.2 | 1344.2 | 1351.0 | 1342.2 |
| 175°   | 1352.8 | 1346.0 | 1348.0 | 1354.8 | 1345.1 |
| 177.5° | 1354.8 | 1348.0 | 1349.0 | 1355.9 | 1347.1 |
| 180°   | 1350.0 | 1350.0 | 1350.0 | 1350.0 | 1350.0 |

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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 | 13.03            | 14.06 | 13.80 | 14.85 | 15.80 | 9.00           | 10.03 | 9.77  | 10.81 | 11.77 |
|                 | 3H   | 14.73            | 15.65 | 15.51 | 16.45 | 17.43 | 10.20          | 11.12 | 10.99 | 11.92 | 12.90 |
|                 | 4H   | 15.35            | 16.22 | 16.15 | 17.02 | 18.01 | 10.66          | 11.53 | 11.46 | 12.34 | 13.33 |
|                 | 6H   | 15.78            | 16.58 | 16.60 | 17.40 | 18.40 | 11.00          | 11.79 | 11.81 | 12.61 | 13.61 |
|                 | 8H   | 15.92            | 16.68 | 16.74 | 17.51 | 18.52 | 11.09          | 11.85 | 11.91 | 12.68 | 13.69 |
|                 | 12H  | 15.99            | 16.71 | 16.81 | 17.53 | 18.57 | 11.14          | 11.87 | 11.97 | 12.69 | 13.73 |
| 4H              | 2H   | 13.08            | 13.94 | 13.88 | 14.75 | 15.74 | 9.62           | 10.49 | 10.43 | 11.29 | 12.29 |
|                 | 3H   | 14.93            | 15.65 | 15.74 | 16.49 | 17.50 | 10.99          | 11.71 | 11.81 | 12.55 | 13.56 |
|                 | 4H   | 15.63            | 16.28 | 16.46 | 17.12 | 18.16 | 11.55          | 12.20 | 12.38 | 13.04 | 14.08 |
|                 | 6H   | 16.16            | 16.72 | 17.00 | 17.58 | 18.63 | 11.98          | 12.54 | 12.82 | 13.40 | 14.45 |
|                 | 8H   | 16.34            | 16.87 | 17.19 | 17.72 | 18.78 | 12.11          | 12.64 | 12.96 | 13.49 | 14.55 |
|                 | 12H  | 16.44            | 16.92 | 17.31 | 17.79 | 18.85 | 12.19          | 12.66 | 13.05 | 13.54 | 14.60 |
| 8H              | 4H   | 15.61            | 16.14 | 16.46 | 16.99 | 18.05 | 11.84          | 12.37 | 12.69 | 13.23 | 14.28 |
|                 | 6H   | 16.19            | 16.62 | 17.07 | 17.52 | 18.58 | 12.37          | 12.80 | 13.25 | 13.70 | 14.76 |
|                 | 8H   | 16.41            | 16.79 | 17.30 | 17.69 | 18.76 | 12.56          | 12.95 | 13.45 | 13.84 | 14.91 |
|                 | 12H  | 16.56            | 16.90 | 17.45 | 17.78 | 18.91 | 12.69          | 13.03 | 13.58 | 13.92 | 15.04 |
| 12H             | 4H   | 15.57            | 16.05 | 16.44 | 16.92 | 17.98 | 11.86          | 12.33 | 12.73 | 13.21 | 14.27 |
|                 | 6H   | 16.16            | 16.55 | 17.05 | 17.44 | 18.52 | 12.42          | 12.81 | 13.31 | 13.70 | 14.77 |
|                 | 8H   | 16.40            | 16.74 | 17.29 | 17.62 | 18.75 | 12.64          | 12.98 | 13.53 | 13.87 | 14.99 |