

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: P915753

Luminaire Tested: DFN2DIP-TR4F0-120D060US927-RLLONL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P915753  
REPORT IS A COMBINATION OF REPORTS P901942 AND P898849  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-TR4F0-120D060US927-RLLONL  
Description: 4 foot, Triangle Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

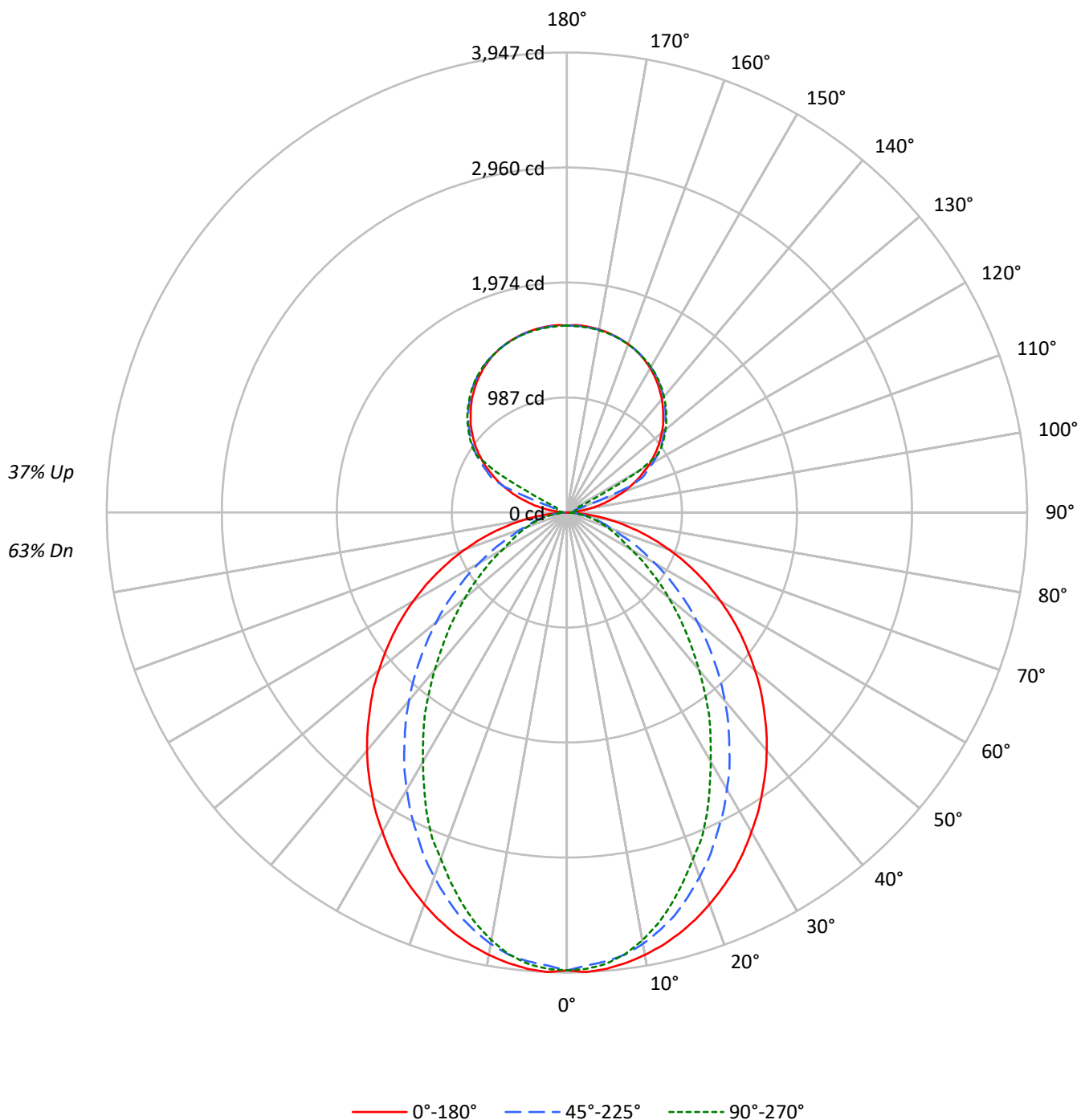
**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 12785.8 lumens  
Efficiency: N/A  
Efficacy: 75.0 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



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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 | 103 | 103 | 103 | 103 | 91 | 91 | 91 | 79 | 79 | 79 | 68 | 68 | 68 |
| 1   | 101 | 97  | 93  | 90  | 95  | 91  | 88  | 85  | 80 | 78 | 76 | 71 | 69 | 67 | 61 | 60 | 59 |
| 2   | 93  | 86  | 80  | 75  | 87  | 81  | 75  | 71  | 71 | 67 | 64 | 63 | 60 | 57 | 55 | 52 | 51 |
| 3   | 85  | 76  | 69  | 63  | 80  | 72  | 65  | 60  | 63 | 58 | 54 | 56 | 52 | 49 | 49 | 46 | 44 |
| 4   | 78  | 68  | 60  | 54  | 73  | 64  | 57  | 52  | 57 | 51 | 47 | 50 | 46 | 43 | 44 | 41 | 38 |
| 5   | 72  | 61  | 53  | 47  | 67  | 57  | 50  | 45  | 51 | 45 | 41 | 46 | 41 | 37 | 40 | 37 | 34 |
| 6   | 67  | 55  | 47  | 41  | 62  | 52  | 45  | 39  | 46 | 41 | 36 | 41 | 37 | 33 | 37 | 33 | 30 |
| 7   | 62  | 50  | 42  | 36  | 58  | 47  | 40  | 35  | 42 | 36 | 32 | 38 | 33 | 30 | 34 | 30 | 27 |
| 8   | 58  | 45  | 38  | 32  | 54  | 43  | 36  | 31  | 39 | 33 | 29 | 35 | 30 | 27 | 31 | 27 | 24 |
| 9   | 54  | 42  | 34  | 29  | 51  | 40  | 33  | 28  | 36 | 30 | 26 | 32 | 27 | 24 | 29 | 25 | 22 |
| 10  | 50  | 38  | 31  | 26  | 47  | 37  | 30  | 25  | 33 | 28 | 24 | 30 | 25 | 22 | 27 | 23 | 20 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 3121 | 3121 | 3121 |
| 5°  | 3126 | 3072 | 3091 |
| 10° | 3095 | 3011 | 2991 |
| 15° | 3053 | 2912 | 2835 |
| 20° | 2996 | 2775 | 2644 |
| 25° | 2939 | 2621 | 2460 |
| 30° | 2861 | 2463 | 2226 |
| 35° | 2785 | 2293 | 2021 |
| 40° | 2708 | 2118 | 1785 |
| 45° | 2618 | 1923 | 1572 |
| 50° | 2526 | 1727 | 1363 |
| 55° | 2429 | 1517 | 1163 |
| 60° | 2316 | 1297 | 957  |
| 65° | 2188 | 1074 | 862  |
| 70° | 2031 | 866  | 779  |
| 75° | 1835 | 764  | 709  |
| 80° | 1550 | 640  | 614  |
| 85° | 1081 | 427  | 461  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°  
Vertical Angle: 45°  
Luminance: 2618 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 368.2   | 2.9       |
| 10°-20°   | 1010.8  | 7.9       |
| 20°-30°   | 1419.2  | 11.1      |
| 30°-40°   | 1547.0  | 12.1      |
| 40°-50°   | 1421.9  | 11.1      |
| 50°-60°   | 1116.7  | 8.7       |
| 60°-70°   | 726.9   | 5.7       |
| 70°-80°   | 374.2   | 2.9       |
| 80°-90°   | 98.3    | 0.8       |
| 90°-100°  | 52.9    | 0.4       |
| 100°-110° | 197.2   | 1.5       |
| 110°-120° | 523.0   | 4.1       |
| 120°-130° | 867.4   | 6.8       |
| 130°-140° | 921.3   | 7.2       |
| 140°-150° | 856.3   | 6.7       |
| 150°-160° | 688.4   | 5.4       |
| 160°-170° | 443.6   | 3.5       |
| 170°-180° | 152.7   | 1.2       |
| 0°-30°    | 2798.2  | 21.9      |
| 0°-40°    | 4345.2  | 34.0      |
| 0°-60°    | 6883.7  | 53.8      |
| 0°-90°    | 8083.1  | 63.2      |
| 90°-120°  | 773.0   | 6.0       |
| 90°-150°  | 3418.0  | 26.7      |
| 90°-180°  | 4703.0  | 36.8      |
| 0°-180°   | 12785.8 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 3929 | 3929  | 3929 | 3929  | 3929 |      |
| 5°   | 3929 | 3911  | 3865 | 3897  | 3886 | 373  |
| 15°  | 3737 | 3698  | 3577 | 3509  | 3474 | 1053 |
| 25°  | 3392 | 3278  | 3044 | 2898  | 2844 | 1560 |
| 35°  | 2923 | 2741  | 2429 | 2205  | 2126 | 1829 |
| 45°  | 2389 | 2151  | 1778 | 1525  | 1440 | 1845 |
| 55°  | 1817 | 1540  | 1156 | 942   | 875  | 1623 |
| 65°  | 1227 | 939   | 619  | 498   | 487  | 1216 |
| 75°  | 654  | 405   | 284  | 260   | 256  | 692  |
| 85°  | 153  | 78    | 68   | 68    | 68   | 175  |
| 90°  | 1    | 14    | 23   | 29    | 31   | 12   |
| 95°  | 75   | 37    | 45   | 51    | 50   | 89   |
| 105° | 353  | 388   | 71   | 84    | 88   | 377  |
| 115° | 667  | 687   | 716  | 179   | 95   | 657  |
| 125° | 944  | 959   | 981  | 989   | 992  | 842  |
| 135° | 1168 | 1186  | 1197 | 1208  | 1206 | 902  |
| 145° | 1355 | 1353  | 1373 | 1381  | 1376 | 847  |
| 155° | 1492 | 1481  | 1495 | 1502  | 1493 | 687  |
| 165° | 1572 | 1565  | 1568 | 1576  | 1568 | 444  |
| 175° | 1608 | 1599  | 1602 | 1610  | 1598 | 153  |
| 180° | 1604 | 1604  | 1604 | 1604  | 1604 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 3928.9 | 3928.9 | 3928.9 | 3928.9 | 3928.9 |
| 2.5°   | 3946.6 | 3928.9 | 3889.7 | 3925.5 | 3918.3 |
| 5°     | 3928.9 | 3911.2 | 3864.7 | 3896.8 | 3886.3 |
| 7.5°   | 3896.8 | 3875.7 | 3825.9 | 3839.9 | 3822.1 |
| 10°    | 3854.2 | 3829.3 | 3758.3 | 3747.4 | 3726.3 |
| 12.5°  | 3801.0 | 3769.0 | 3672.7 | 3651.6 | 3612.4 |
| 15°    | 3736.9 | 3697.7 | 3576.9 | 3509.4 | 3474.0 |
| 17.5°  | 3662.2 | 3605.2 | 3455.8 | 3377.8 | 3320.8 |
| 20°    | 3576.9 | 3505.6 | 3328.0 | 3239.3 | 3160.8 |
| 22.5°  | 3484.5 | 3402.7 | 3196.3 | 3075.6 | 3022.4 |
| 25°    | 3392.1 | 3278.1 | 3043.5 | 2897.9 | 2844.3 |
| 27.5°  | 3281.9 | 3160.8 | 2901.3 | 2734.2 | 2652.3 |
| 30°    | 3164.6 | 3029.2 | 2744.7 | 2563.7 | 2467.5 |
| 32.5°  | 3050.7 | 2886.9 | 2595.7 | 2382.2 | 2293.2 |
| 35°    | 2922.8 | 2741.3 | 2428.6 | 2204.6 | 2126.1 |
| 37.5°  | 2798.3 | 2602.6 | 2272.1 | 2026.5 | 1937.8 |
| 40°    | 2666.6 | 2453.5 | 2108.4 | 1856.0 | 1763.6 |
| 42.5°  | 2531.6 | 2304.1 | 1945.0 | 1681.7 | 1593.1 |
| 45°    | 2389.4 | 2151.0 | 1777.9 | 1525.2 | 1439.9 |
| 47.5°  | 2254.3 | 2002.0 | 1618.0 | 1365.2 | 1287.1 |
| 50°    | 2105.0 | 1852.6 | 1461.4 | 1215.8 | 1141.5 |
| 52.5°  | 1959.0 | 1692.3 | 1312.0 | 1077.4 | 1009.9 |
| 55°    | 1816.8 | 1539.5 | 1155.5 | 942.3  | 874.8  |
| 57.5°  | 1671.1 | 1386.7 | 1017.0 | 817.8  | 760.9  |
| 60°    | 1521.8 | 1237.3 | 871.0  | 690.0  | 633.0  |
| 62.5°  | 1376.2 | 1091.7 | 746.6  | 576.1  | 547.7  |
| 65°    | 1226.8 | 938.6  | 618.7  | 498.0  | 487.0  |
| 67.5°  | 1084.6 | 796.3  | 498.0  | 437.2  | 426.7  |
| 70°    | 935.2  | 657.9  | 412.3  | 376.8  | 362.5  |
| 72.5°  | 793.0  | 529.7  | 344.8  | 316.5  | 309.3  |
| 75°    | 654.1  | 405.1  | 284.5  | 259.5  | 256.1  |
| 77.5°  | 515.7  | 287.8  | 224.1  | 209.8  | 202.6  |
| 80°    | 387.5  | 206.4  | 170.5  | 156.5  | 156.5  |
| 82.5°  | 270.1  | 138.8  | 117.3  | 110.1  | 110.1  |
| 85°    | 152.8  | 78.1   | 67.5   | 67.5   | 67.5   |
| 87.5°  | 57.0   | 28.3   | 28.3   | 24.9   | 24.9   |
| 90°    | 1.1    | 13.9   | 23.1   | 29.1   | 31.3   |
| 92.5°  | 29.1   | 24.4   | 27.8   | 30.2   | 31.3   |
| 95°    | 75.4   | 37.1   | 45.2   | 51.2   | 49.9   |
| 97.5°  | 135.8  | 40.6   | 59.1   | 62.7   | 63.8   |
| 100°   | 205.5  | 46.4   | 66.1   | 75.4   | 77.7   |
| 102.5° | 282.0  | 279.8  | 68.5   | 81.2   | 84.8   |
| 105°   | 352.8  | 387.7  | 70.8   | 83.5   | 88.2   |
| 107.5° | 435.3  | 464.2  | 73.2   | 85.9   | 90.5   |
| 110°   | 514.3  | 538.5  | 203.2  | 87.1   | 91.7   |



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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 588.5  | 609.3  | 589.6  | 89.3   | 92.9   |
| 115°   | 667.4  | 687.1  | 716.2  | 178.8  | 95.2   |
| 117.5° | 735.9  | 759.1  | 778.9  | 612.8  | 308.7  |
| 120°   | 812.5  | 829.9  | 850.9  | 864.7  | 708.1  |
| 122.5° | 877.4  | 896.0  | 919.3  | 926.2  | 927.5  |
| 125°   | 943.6  | 958.8  | 980.8  | 989.0  | 992.4  |
| 127.5° | 1004.0 | 1020.3 | 1037.8 | 1049.3 | 1050.4 |
| 130°   | 1060.9 | 1079.5 | 1092.2 | 1105.0 | 1103.9 |
| 132.5° | 1119.0 | 1134.1 | 1146.8 | 1157.2 | 1156.1 |
| 135°   | 1167.8 | 1186.4 | 1196.7 | 1208.4 | 1206.0 |
| 137.5° | 1218.7 | 1232.6 | 1244.4 | 1255.9 | 1252.5 |
| 140°   | 1268.6 | 1278.0 | 1290.7 | 1301.2 | 1295.4 |
| 142.5° | 1310.5 | 1318.7 | 1333.7 | 1342.9 | 1337.1 |
| 145°   | 1354.6 | 1353.4 | 1373.1 | 1381.2 | 1375.5 |
| 147.5° | 1392.8 | 1389.3 | 1409.1 | 1414.8 | 1410.3 |
| 150°   | 1430.0 | 1421.9 | 1440.5 | 1447.4 | 1441.6 |
| 152.5° | 1461.3 | 1452.1 | 1469.4 | 1476.5 | 1468.3 |
| 155°   | 1491.5 | 1481.1 | 1495.1 | 1502.0 | 1492.7 |
| 157.5° | 1515.9 | 1506.6 | 1517.1 | 1525.3 | 1515.9 |
| 160°   | 1536.8 | 1529.8 | 1536.8 | 1543.7 | 1535.6 |
| 162.5° | 1555.3 | 1548.4 | 1554.2 | 1562.3 | 1551.9 |
| 165°   | 1571.6 | 1564.7 | 1568.1 | 1576.3 | 1568.1 |
| 167.5° | 1584.4 | 1577.4 | 1581.0 | 1589.1 | 1578.6 |
| 170°   | 1594.9 | 1587.8 | 1590.2 | 1598.3 | 1587.8 |
| 172.5° | 1601.8 | 1594.9 | 1597.2 | 1605.4 | 1594.9 |
| 175°   | 1607.6 | 1599.4 | 1601.8 | 1609.9 | 1598.3 |
| 177.5° | 1609.9 | 1601.8 | 1603.0 | 1611.1 | 1600.7 |
| 180°   | 1604.1 | 1604.1 | 1604.1 | 1604.1 | 1604.1 |

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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 | 12.25            | 13.20 | 13.09 | 14.06 | 15.13 | 8.22           | 9.17  | 9.06  | 10.03 | 11.10 |
|                 | 3H   | 13.94            | 14.79 | 14.79 | 15.65 | 16.75 | 9.42           | 10.27 | 10.28 | 11.14 | 12.24 |
|                 | 4H   | 14.55            | 15.35 | 15.42 | 16.23 | 17.34 | 9.88           | 10.68 | 10.75 | 11.56 | 12.67 |
|                 | 6H   | 14.98            | 15.72 | 15.86 | 16.60 | 17.72 | 10.21          | 10.94 | 11.09 | 11.83 | 12.95 |
|                 | 8H   | 15.11            | 15.81 | 16.00 | 16.71 | 17.83 | 10.30          | 11.00 | 11.19 | 11.90 | 13.03 |
|                 | 12H  | 15.17            | 15.84 | 16.07 | 16.73 | 17.88 | 10.35          | 11.02 | 11.24 | 11.91 | 13.06 |
| 4H              | 2H   | 12.28            | 13.08 | 13.16 | 13.96 | 15.07 | 8.83           | 9.63  | 9.71  | 10.51 | 11.62 |
|                 | 3H   | 14.12            | 14.79 | 15.01 | 15.70 | 16.82 | 10.19          | 10.86 | 11.08 | 11.77 | 12.89 |
|                 | 4H   | 14.82            | 15.43 | 15.72 | 16.33 | 17.48 | 10.75          | 11.35 | 11.65 | 12.26 | 13.41 |
|                 | 6H   | 15.34            | 15.86 | 16.25 | 16.79 | 17.94 | 11.17          | 11.70 | 12.09 | 12.62 | 13.78 |
|                 | 8H   | 15.52            | 16.01 | 16.43 | 16.93 | 18.09 | 11.31          | 11.79 | 12.22 | 12.72 | 13.88 |
|                 | 12H  | 15.62            | 16.06 | 16.55 | 17.00 | 18.17 | 11.38          | 11.82 | 12.31 | 12.76 | 13.93 |
| 8H              | 4H   | 14.80            | 15.28 | 15.71 | 16.21 | 17.37 | 11.04          | 11.52 | 11.95 | 12.45 | 13.61 |
|                 | 6H   | 15.37            | 15.77 | 16.31 | 16.73 | 17.90 | 11.56          | 11.96 | 12.50 | 12.93 | 14.09 |
|                 | 8H   | 15.58            | 15.94 | 16.53 | 16.89 | 18.08 | 11.75          | 12.11 | 12.70 | 13.06 | 14.25 |
|                 | 12H  | 15.73            | 16.04 | 16.68 | 16.99 | 18.22 | 11.88          | 12.19 | 12.83 | 13.14 | 14.37 |
| 12H             | 4H   | 14.75            | 15.19 | 15.69 | 16.13 | 17.30 | 11.05          | 11.49 | 11.98 | 12.43 | 13.60 |
|                 | 6H   | 15.34            | 15.70 | 16.29 | 16.65 | 17.84 | 11.61          | 11.97 | 12.56 | 12.92 | 14.11 |
|                 | 8H   | 15.57            | 15.88 | 16.52 | 16.83 | 18.06 | 11.83          | 12.14 | 12.78 | 13.09 | 14.32 |