

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: P917515

Luminaire Tested: DFN2DIP-SQ3F0-110D060US930-RLLONL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P917515  
REPORT IS A COMBINATION OF REPORTS P901432 AND P898289  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-SQ3F0-110D060US930-RLLONL  
Description: 3 foot, Square Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

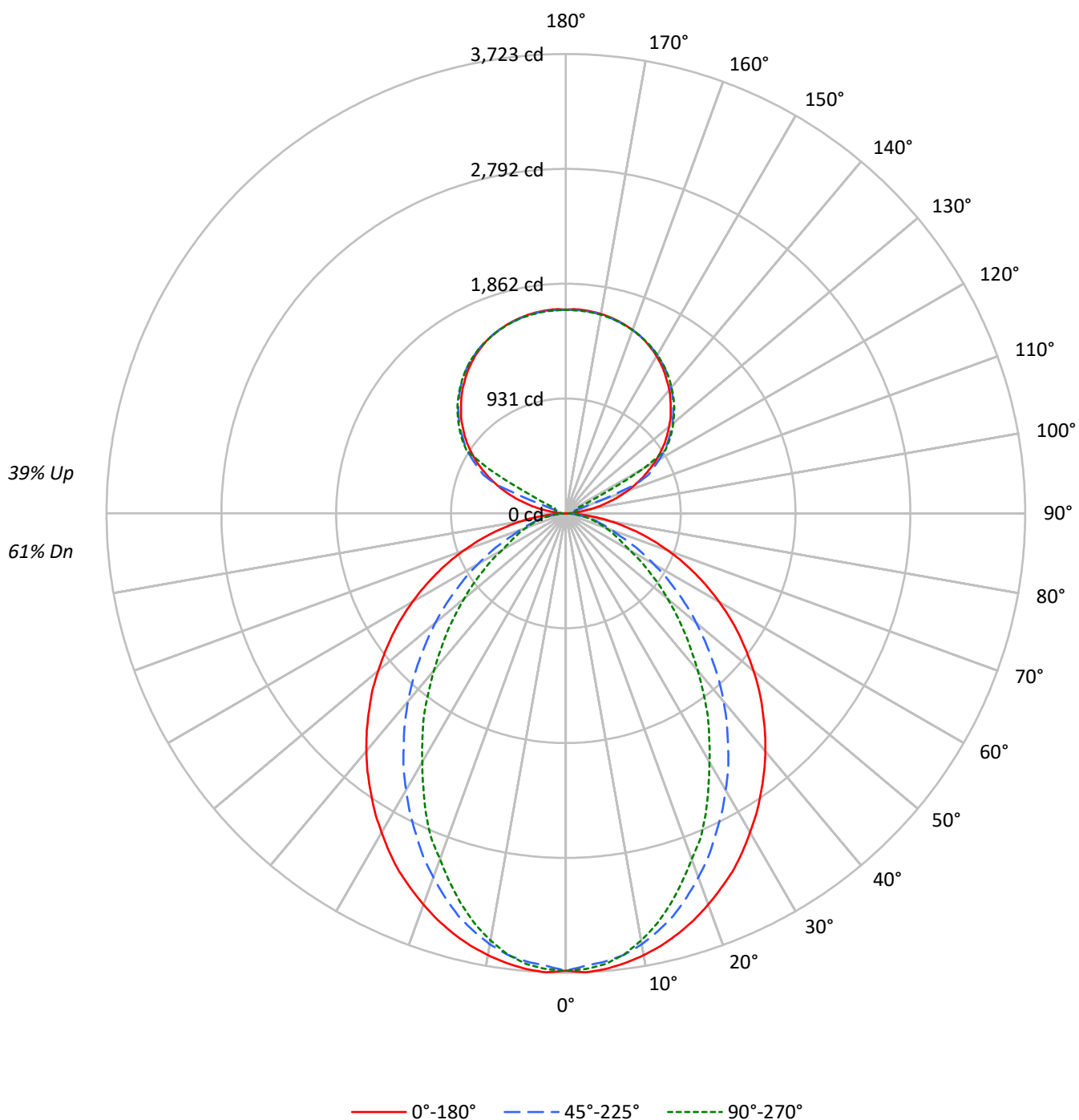
Lumens per Lamp: N/A  
Luminaire Lumens: 12465.9 lumens  
Efficiency: N/A  
Efficacy: 79.4 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 0.99 / 1.16  
Luminous Opening: Rectangular w/ Sides (W: 3.06' x L: 3.06' x H: 0.1')  
CIE Type: Semi-Direct

Input Watts (W): 157  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9977  
Total Harmonic Distortion (THDi): 0.049  
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 | 90 | 90 | 90 | 77 | 77 | 77 | 66 | 66 | 66 |
| 1   | 101 | 97  | 93  | 90  | 94  | 91  | 87  | 85  | 79 | 77 | 75 | 69 | 67 | 66 | 60 | 58 | 57 |
| 2   | 92  | 85  | 79  | 74  | 86  | 80  | 75  | 70  | 70 | 66 | 63 | 61 | 58 | 56 | 53 | 51 | 49 |
| 3   | 85  | 75  | 68  | 63  | 79  | 71  | 65  | 60  | 63 | 58 | 54 | 55 | 51 | 48 | 48 | 45 | 43 |
| 4   | 78  | 67  | 59  | 54  | 73  | 63  | 56  | 51  | 56 | 51 | 46 | 49 | 45 | 42 | 43 | 40 | 37 |
| 5   | 72  | 60  | 52  | 46  | 67  | 57  | 50  | 44  | 51 | 45 | 40 | 45 | 40 | 37 | 39 | 36 | 33 |
| 6   | 66  | 54  | 46  | 41  | 62  | 51  | 44  | 39  | 46 | 40 | 36 | 41 | 36 | 32 | 36 | 32 | 29 |
| 7   | 61  | 49  | 41  | 36  | 58  | 47  | 40  | 35  | 42 | 36 | 32 | 37 | 32 | 29 | 33 | 29 | 26 |
| 8   | 57  | 45  | 37  | 32  | 54  | 43  | 36  | 31  | 38 | 33 | 28 | 34 | 29 | 26 | 30 | 26 | 24 |
| 9   | 53  | 41  | 34  | 29  | 50  | 39  | 32  | 28  | 35 | 30 | 26 | 32 | 27 | 24 | 28 | 24 | 22 |
| 10  | 50  | 38  | 31  | 26  | 47  | 36  | 30  | 25  | 33 | 27 | 23 | 29 | 25 | 21 | 26 | 22 | 20 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 4247 | 4247 | 4247 |
| 5°  | 4251 | 4177 | 4205 |
| 10° | 4206 | 4092 | 4067 |
| 15° | 4146 | 3954 | 3854 |
| 20° | 4066 | 3765 | 3593 |
| 25° | 3985 | 3554 | 3342 |
| 30° | 3877 | 3337 | 3023 |
| 35° | 3771 | 3105 | 2743 |
| 40° | 3663 | 2864 | 2422 |
| 45° | 3537 | 2598 | 2132 |
| 50° | 3407 | 2330 | 1848 |
| 55° | 3271 | 2043 | 1575 |
| 60° | 3114 | 1744 | 1295 |
| 65° | 2932 | 1440 | 1164 |
| 70° | 2712 | 1157 | 1051 |
| 75° | 2435 | 1013 | 954  |
| 80° | 2035 | 841  | 822  |
| 85° | 1380 | 548  | 610  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 3537 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 347.4   | 2.8       |
| 10°-20°   | 953.6   | 7.6       |
| 20°-30°   | 1338.9  | 10.7      |
| 30°-40°   | 1459.5  | 11.7      |
| 40°-50°   | 1341.4  | 10.8      |
| 50°-60°   | 1053.5  | 8.5       |
| 60°-70°   | 685.7   | 5.5       |
| 70°-80°   | 353.0   | 2.8       |
| 80°-90°   | 93.0    | 0.7       |
| 90°-100°  | 54.4    | 0.4       |
| 100°-110° | 202.9   | 1.6       |
| 110°-120° | 538.2   | 4.3       |
| 120°-130° | 892.7   | 7.2       |
| 130°-140° | 948.2   | 7.6       |
| 140°-150° | 881.3   | 7.1       |
| 150°-160° | 708.5   | 5.7       |
| 160°-170° | 456.5   | 3.7       |
| 170°-180° | 157.1   | 1.3       |
| 0°-30°    | 2639.9  | 21.2      |
| 0°-40°    | 4099.4  | 32.9      |
| 0°-60°    | 6494.2  | 52.1      |
| 0°-90°    | 7625.9  | 61.2      |
| 90°-120°  | 795.6   | 6.4       |
| 90°-150°  | 3517.8  | 28.2      |
| 90°-180°  | 4840.0  | 38.8      |
| 0°-180°   | 12465.9 | 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    | 24   | 30    | 32   | 12   |
| 95°  | 78   | 38    | 47   | 53    | 51   | 92   |
| 105° | 363  | 399   | 73   | 86    | 91   | 388  |
| 115° | 687  | 707   | 737  | 184   | 98   | 676  |
| 125° | 971  | 987   | 1009 | 1018  | 1021 | 866  |
| 135° | 1202 | 1221  | 1232 | 1244  | 1241 | 928  |
| 145° | 1394 | 1393  | 1413 | 1422  | 1416 | 872  |
| 155° | 1535 | 1524  | 1539 | 1546  | 1536 | 707  |
| 165° | 1618 | 1610  | 1614 | 1622  | 1614 | 457  |
| 175° | 1654 | 1646  | 1648 | 1657  | 1645 | 157  |
| 180° | 1651 | 1651  | 1651 | 1651  | 1651 |      |

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**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    | 14.3   | 23.8   | 29.9   | 32.2   |
| 92.5°  | 29.9   | 25.1   | 28.6   | 31.1   | 32.2   |
| 95°    | 77.6   | 38.2   | 46.6   | 52.7   | 51.4   |
| 97.5°  | 139.7  | 41.8   | 60.8   | 64.6   | 65.7   |
| 100°   | 211.5  | 47.8   | 68.1   | 77.6   | 80.0   |
| 102.5° | 290.2  | 288.0  | 70.5   | 83.6   | 87.2   |
| 105°   | 363.1  | 399.0  | 72.9   | 85.9   | 90.8   |
| 107.5° | 448.0  | 477.8  | 75.3   | 88.4   | 93.2   |
| 110°   | 529.3  | 554.2  | 209.1  | 89.7   | 94.3   |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 605.7  | 627.1  | 606.8  | 91.9   | 95.6   |
| 115°   | 686.9  | 707.2  | 737.1  | 184.0  | 98.0   |
| 117.5° | 757.3  | 781.2  | 801.6  | 630.7  | 317.7  |
| 120°   | 836.3  | 854.1  | 875.7  | 890.0  | 728.7  |
| 122.5° | 903.0  | 922.2  | 946.2  | 953.2  | 954.6  |
| 125°   | 971.2  | 986.8  | 1009.4 | 1017.8 | 1021.3 |
| 127.5° | 1033.3 | 1050.0 | 1068.0 | 1079.9 | 1081.1 |
| 130°   | 1091.8 | 1111.0 | 1124.1 | 1137.3 | 1136.1 |
| 132.5° | 1151.6 | 1167.2 | 1180.2 | 1191.0 | 1189.8 |
| 135°   | 1201.8 | 1221.0 | 1231.6 | 1243.7 | 1241.2 |
| 137.5° | 1254.3 | 1268.6 | 1280.7 | 1292.6 | 1289.1 |
| 140°   | 1305.6 | 1315.3 | 1328.4 | 1339.1 | 1333.2 |
| 142.5° | 1348.7 | 1357.1 | 1372.6 | 1382.1 | 1376.1 |
| 145°   | 1394.2 | 1392.9 | 1413.2 | 1421.6 | 1415.6 |
| 147.5° | 1433.5 | 1429.9 | 1450.2 | 1456.1 | 1451.5 |
| 150°   | 1471.8 | 1463.4 | 1482.5 | 1489.6 | 1483.7 |
| 152.5° | 1504.0 | 1494.4 | 1512.3 | 1519.6 | 1511.2 |
| 155°   | 1535.0 | 1524.4 | 1538.7 | 1545.8 | 1536.3 |
| 157.5° | 1560.2 | 1550.6 | 1561.4 | 1569.8 | 1560.2 |
| 160°   | 1581.7 | 1574.4 | 1581.7 | 1588.8 | 1580.5 |
| 162.5° | 1600.7 | 1593.6 | 1599.5 | 1607.9 | 1597.2 |
| 165°   | 1617.5 | 1610.4 | 1613.9 | 1622.3 | 1613.9 |
| 167.5° | 1630.6 | 1623.4 | 1627.1 | 1635.5 | 1624.6 |
| 170°   | 1641.4 | 1634.2 | 1636.6 | 1644.9 | 1634.2 |
| 172.5° | 1648.5 | 1641.4 | 1643.8 | 1652.2 | 1641.4 |
| 175°   | 1654.5 | 1646.1 | 1648.5 | 1656.8 | 1644.9 |
| 177.5° | 1656.8 | 1648.5 | 1649.8 | 1658.2 | 1647.4 |
| 180°   | 1650.9 | 1650.9 | 1650.9 | 1650.9 | 1650.9 |

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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 | 13.12            | 14.05 | 13.98 | 14.93 | 16.04 | 9.08           | 10.01 | 9.94  | 10.89 | 12.00 |
|                 | 3H   | 14.80            | 15.63 | 15.68 | 16.52 | 17.65 | 10.27          | 11.10 | 11.15 | 11.99 | 13.12 |
|                 | 4H   | 15.41            | 16.20 | 16.30 | 17.09 | 18.23 | 10.72          | 11.51 | 11.61 | 12.40 | 13.54 |
|                 | 6H   | 15.84            | 16.56 | 16.74 | 17.46 | 18.61 | 11.04          | 11.77 | 11.95 | 12.67 | 13.82 |
|                 | 8H   | 15.96            | 16.65 | 16.87 | 17.57 | 18.72 | 11.13          | 11.82 | 12.04 | 12.74 | 13.89 |
|                 | 12H  | 16.03            | 16.68 | 16.94 | 17.59 | 18.77 | 11.18          | 11.83 | 12.09 | 12.74 | 13.92 |
| 4H              | 2H   | 13.15            | 13.94 | 14.05 | 14.83 | 15.97 | 9.69           | 10.47 | 10.58 | 11.37 | 12.51 |
|                 | 3H   | 14.98            | 15.64 | 15.89 | 16.56 | 17.72 | 11.04          | 11.69 | 11.95 | 12.62 | 13.77 |
|                 | 4H   | 15.68            | 16.27 | 16.59 | 17.19 | 18.37 | 11.59          | 12.18 | 12.50 | 13.10 | 14.28 |
|                 | 6H   | 16.19            | 16.70 | 17.12 | 17.65 | 18.83 | 12.00          | 12.52 | 12.94 | 13.46 | 14.64 |
|                 | 8H   | 16.37            | 16.84 | 17.30 | 17.78 | 18.98 | 12.13          | 12.61 | 13.06 | 13.55 | 14.74 |
|                 | 12H  | 16.46            | 16.89 | 17.42 | 17.85 | 19.05 | 12.20          | 12.63 | 13.15 | 13.58 | 14.79 |
| 8H              | 4H   | 15.65            | 16.13 | 16.58 | 17.07 | 18.26 | 11.87          | 12.35 | 12.80 | 13.29 | 14.48 |
|                 | 6H   | 16.21            | 16.61 | 17.17 | 17.59 | 18.79 | 12.38          | 12.78 | 13.34 | 13.76 | 14.96 |
|                 | 8H   | 16.43            | 16.78 | 17.40 | 17.75 | 18.96 | 12.57          | 12.92 | 13.54 | 13.89 | 15.11 |
|                 | 12H  | 16.57            | 16.87 | 17.54 | 17.84 | 19.10 | 12.69          | 13.00 | 13.66 | 13.96 | 15.22 |
| 12H             | 4H   | 15.61            | 16.04 | 16.56 | 16.99 | 18.19 | 11.88          | 12.31 | 12.83 | 13.27 | 14.47 |
|                 | 6H   | 16.19            | 16.54 | 17.16 | 17.51 | 18.72 | 12.43          | 12.78 | 13.40 | 13.75 | 14.97 |
|                 | 8H   | 16.41            | 16.72 | 17.38 | 17.68 | 18.94 | 12.64          | 12.95 | 13.61 | 13.91 | 15.18 |