

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: P903797

Luminaire Tested: DFN2DIP-SQ3F0-090D050US830-FLLONL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P903797  
REPORT IS A COMBINATION OF REPORTS P901409 AND P898289  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-SQ3F0-090D050US830-FLLONL  
Description: 3 foot, Square Define Geo, with Direct Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

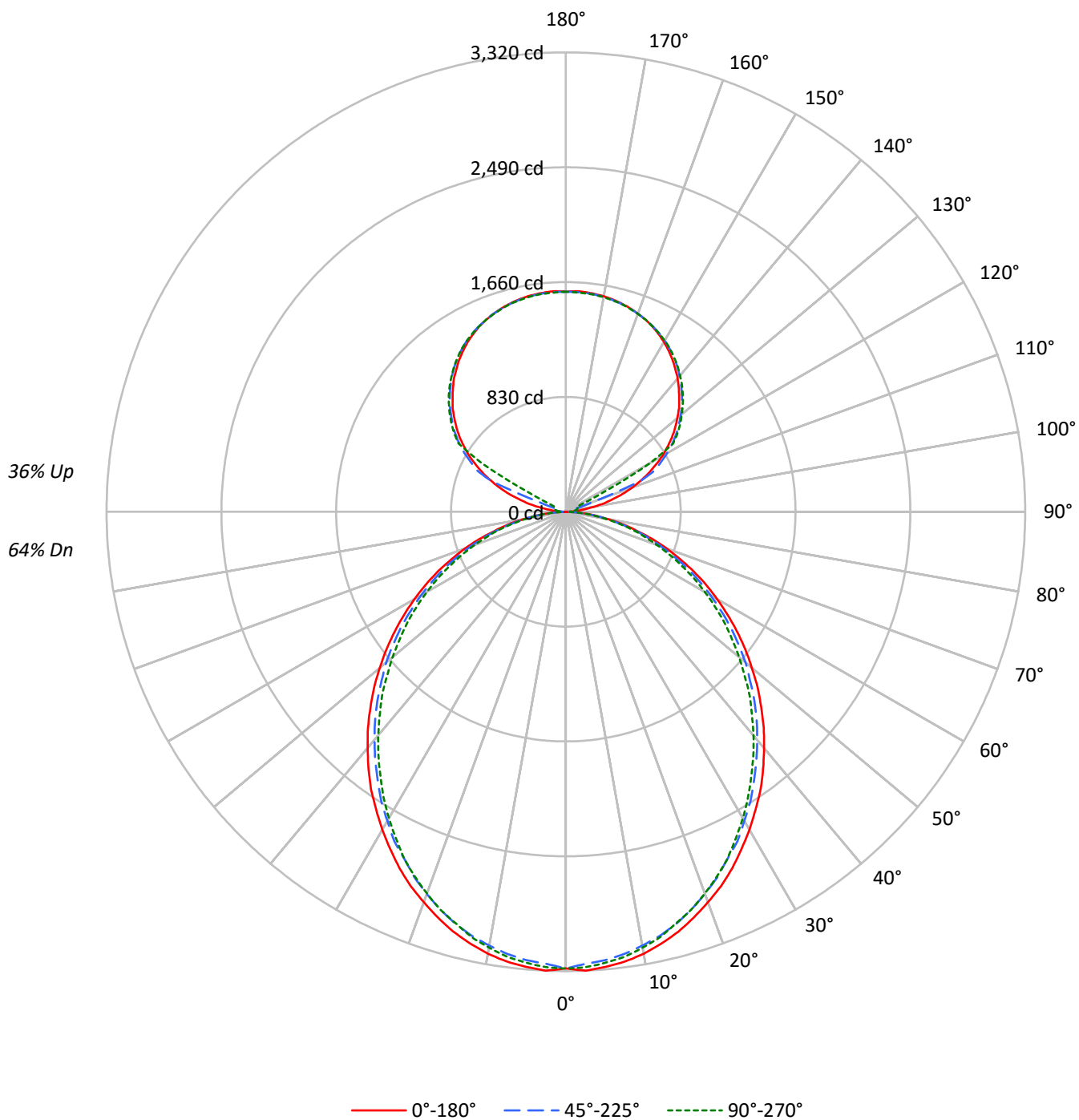
Lumens per Lamp: N/A  
Luminaire Lumens: 13063.7 lumens  
Efficiency: N/A  
Efficacy: 104.8 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 3.06' x L: 3.06' x H: 0.1')  
CIE Type: Semi-Direct

Input Watts (W): 124.7  
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



TEST NUMBER: P903797

CATALOG NUMBER: DFN2DIP-SQ3F0-090D050US830-FLONL

**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 | 91 | 91 | 91 | 80 | 80 | 80 | 69 | 69 | 69 |
| 1   | 101 | 97  | 93  | 89  | 95  | 91  | 87  | 84  | 80 | 78 | 75 | 70 | 68 | 67 | 61 | 60 | 59 |
| 2   | 92  | 84  | 78  | 73  | 86  | 79  | 74  | 69  | 70 | 66 | 62 | 62 | 59 | 56 | 54 | 51 | 49 |
| 3   | 84  | 74  | 67  | 61  | 79  | 70  | 63  | 58  | 62 | 57 | 52 | 55 | 51 | 47 | 48 | 45 | 42 |
| 4   | 77  | 66  | 58  | 51  | 72  | 62  | 55  | 49  | 55 | 49 | 45 | 49 | 44 | 40 | 43 | 39 | 36 |
| 5   | 71  | 59  | 50  | 44  | 66  | 55  | 48  | 42  | 49 | 43 | 39 | 44 | 39 | 35 | 39 | 35 | 32 |
| 6   | 65  | 53  | 44  | 38  | 61  | 50  | 42  | 37  | 45 | 38 | 34 | 40 | 35 | 31 | 35 | 31 | 28 |
| 7   | 60  | 48  | 40  | 34  | 57  | 45  | 38  | 33  | 41 | 34 | 30 | 36 | 31 | 27 | 32 | 28 | 25 |
| 8   | 56  | 43  | 35  | 30  | 53  | 41  | 34  | 29  | 37 | 31 | 27 | 33 | 28 | 24 | 29 | 25 | 22 |
| 9   | 52  | 40  | 32  | 27  | 49  | 38  | 31  | 26  | 34 | 28 | 24 | 30 | 26 | 22 | 27 | 23 | 20 |
| 10  | 49  | 37  | 29  | 24  | 46  | 35  | 28  | 23  | 31 | 26 | 22 | 28 | 23 | 20 | 25 | 21 | 18 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 3782 | 3782 | 3782 |
| 5°  | 3786 | 3727 | 3753 |
| 10° | 3753 | 3674 | 3701 |
| 15° | 3695 | 3611 | 3620 |
| 20° | 3618 | 3524 | 3538 |
| 25° | 3541 | 3422 | 3443 |
| 30° | 3446 | 3325 | 3322 |
| 35° | 3355 | 3213 | 3195 |
| 40° | 3244 | 3098 | 3073 |
| 45° | 3133 | 2984 | 2949 |
| 50° | 3011 | 2864 | 2805 |
| 55° | 2884 | 2724 | 2672 |
| 60° | 2740 | 2560 | 2520 |
| 65° | 2582 | 2388 | 2341 |
| 70° | 2381 | 2180 | 2147 |
| 75° | 2104 | 1930 | 1967 |
| 80° | 1768 | 1609 | 1626 |
| 85° | 1245 | 1066 | 1064 |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 3133 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 310.7   | 2.4       |
| 10°-20°   | 874.1   | 6.7       |
| 20°-30°   | 1284.6  | 9.8       |
| 30°-40°   | 1492.0  | 11.4      |
| 40°-50°   | 1490.1  | 11.4      |
| 50°-60°   | 1299.3  | 9.9       |
| 60°-70°   | 960.5   | 7.4       |
| 70°-80°   | 543.4   | 4.2       |
| 80°-90°   | 146.2   | 1.1       |
| 90°-100°  | 52.5    | 0.4       |
| 100°-110° | 195.5   | 1.5       |
| 110°-120° | 518.5   | 4.0       |
| 120°-130° | 860.0   | 6.6       |
| 130°-140° | 913.5   | 7.0       |
| 140°-150° | 849.0   | 6.5       |
| 150°-160° | 682.6   | 5.2       |
| 160°-170° | 439.8   | 3.4       |
| 170°-180° | 151.4   | 1.2       |
| 0°-30°    | 2469.3  | 18.9      |
| 0°-40°    | 3961.3  | 30.3      |
| 0°-60°    | 6750.7  | 51.7      |
| 0°-90°    | 8400.9  | 64.3      |
| 90°-120°  | 766.5   | 5.9       |
| 90°-150°  | 3389.0  | 25.9      |
| 90°-180°  | 4663.0  | 35.7      |
| 0°-180°   | 13063.7 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 3301 | 3301  | 3301 | 3301  | 3301 |      |
| 5°   | 3301 | 3288  | 3253 | 3278  | 3272 | 313  |
| 15°  | 3142 | 3123  | 3082 | 3095  | 3079 | 885  |
| 25°  | 2844 | 2818  | 2765 | 2771  | 2765 | 1309 |
| 35°  | 2454 | 2422  | 2371 | 2352  | 2336 | 1532 |
| 45°  | 1996 | 1974  | 1926 | 1892  | 1879 | 1541 |
| 55°  | 1511 | 1492  | 1454 | 1416  | 1400 | 1351 |
| 65°  | 1019 | 1000  | 968  | 940   | 924  | 1007 |
| 75°  | 533  | 527   | 511  | 492   | 498  | 569  |
| 85°  | 130  | 127   | 124  | 114   | 111  | 145  |
| 90°  | 1    | 14    | 23   | 29    | 31   | 12   |
| 95°  | 75   | 37    | 45   | 51    | 50   | 89   |
| 105° | 350  | 384   | 70   | 83    | 88   | 374  |
| 115° | 662  | 681   | 710  | 177   | 94   | 651  |
| 125° | 936  | 951   | 972  | 980   | 984  | 834  |
| 135° | 1158 | 1176  | 1186 | 1198  | 1196 | 894  |
| 145° | 1343 | 1342  | 1361 | 1370  | 1364 | 840  |
| 155° | 1479 | 1469  | 1482 | 1489  | 1480 | 681  |
| 165° | 1558 | 1551  | 1555 | 1563  | 1555 | 440  |
| 175° | 1594 | 1586  | 1588 | 1596  | 1585 | 152  |
| 180° | 1590 | 1590  | 1590 | 1590  | 1590 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 3300.7 | 3300.7 | 3300.7 | 3300.7 | 3300.7 |
| 2.5°   | 3319.9 | 3304.1 | 3269.1 | 3300.7 | 3294.7 |
| 5°     | 3300.7 | 3288.2 | 3253.3 | 3278.5 | 3272.4 |
| 7.5°   | 3278.5 | 3259.7 | 3224.6 | 3250.3 | 3243.9 |
| 10°    | 3243.9 | 3221.6 | 3183.5 | 3208.8 | 3199.4 |
| 12.5°  | 3196.0 | 3177.1 | 3139.1 | 3154.9 | 3148.6 |
| 15°    | 3142.2 | 3123.3 | 3081.8 | 3094.6 | 3078.8 |
| 17.5°  | 3075.4 | 3056.6 | 3015.2 | 3031.0 | 3015.2 |
| 20°    | 3002.4 | 2983.5 | 2939.0 | 2948.5 | 2936.0 |
| 22.5°  | 2929.6 | 2901.1 | 2859.6 | 2859.6 | 2853.2 |
| 25°    | 2843.7 | 2818.5 | 2764.7 | 2770.7 | 2764.7 |
| 27.5°  | 2748.5 | 2726.2 | 2685.2 | 2675.8 | 2659.9 |
| 30°    | 2653.5 | 2627.9 | 2580.4 | 2571.0 | 2558.2 |
| 32.5°  | 2551.8 | 2533.0 | 2482.1 | 2463.0 | 2450.1 |
| 35°    | 2453.5 | 2421.9 | 2371.0 | 2351.8 | 2336.0 |
| 37.5°  | 2342.4 | 2313.8 | 2262.9 | 2240.7 | 2224.9 |
| 40°    | 2228.2 | 2202.6 | 2151.7 | 2123.5 | 2110.7 |
| 42.5°  | 2117.0 | 2091.5 | 2041.0 | 2009.0 | 1990.2 |
| 45°    | 1996.5 | 1974.3 | 1926.5 | 1891.8 | 1879.1 |
| 47.5°  | 1879.1 | 1856.8 | 1805.9 | 1770.9 | 1752.1 |
| 50°    | 1755.1 | 1739.3 | 1694.8 | 1650.4 | 1634.6 |
| 52.5°  | 1634.6 | 1612.3 | 1571.2 | 1536.2 | 1514.0 |
| 55°    | 1511.0 | 1491.8 | 1453.7 | 1415.7 | 1399.9 |
| 57.5°  | 1387.0 | 1371.2 | 1329.8 | 1291.8 | 1278.9 |
| 60°    | 1263.1 | 1250.7 | 1206.2 | 1171.2 | 1161.8 |
| 62.5°  | 1142.5 | 1120.3 | 1088.6 | 1057.1 | 1044.2 |
| 65°    | 1019.0 | 999.8  | 968.1  | 939.5  | 923.7  |
| 67.5°  | 892.0  | 875.9  | 847.5  | 825.4  | 812.6  |
| 70°    | 774.5  | 761.7  | 733.1  | 710.9  | 698.4  |
| 72.5°  | 653.9  | 641.1  | 625.3  | 603.1  | 593.7  |
| 75°    | 533.1  | 527.0  | 510.9  | 492.0  | 498.4  |
| 77.5°  | 425.3  | 412.6  | 406.1  | 396.7  | 387.3  |
| 80°    | 317.5  | 314.1  | 307.7  | 298.3  | 292.0  |
| 82.5°  | 215.8  | 215.8  | 212.8  | 200.0  | 200.0  |
| 85°    | 130.0  | 127.0  | 123.9  | 114.1  | 111.1  |
| 87.5°  | 57.2   | 50.8   | 44.5   | 35.1   | 31.7   |
| 90°    | 1.1    | 13.8   | 23.0   | 28.8   | 31.0   |
| 92.5°  | 28.8   | 24.2   | 27.6   | 30.0   | 31.0   |
| 95°    | 74.7   | 36.8   | 44.9   | 50.7   | 49.5   |
| 97.5°  | 134.6  | 40.3   | 58.6   | 62.2   | 63.2   |
| 100°   | 203.8  | 46.1   | 65.6   | 74.7   | 77.1   |
| 102.5° | 279.7  | 277.4  | 68.0   | 80.5   | 84.1   |
| 105°   | 349.9  | 384.5  | 70.2   | 82.8   | 87.5   |
| 107.5° | 431.6  | 460.2  | 72.6   | 85.1   | 89.8   |
| 110°   | 509.9  | 534.0  | 201.4  | 86.3   | 90.9   |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 583.5  | 604.2  | 584.7  | 88.6   | 92.1   |
| 115°   | 661.8  | 681.3  | 710.1  | 177.3  | 94.4   |
| 117.5° | 729.6  | 752.6  | 772.3  | 607.6  | 306.1  |
| 120°   | 805.6  | 822.8  | 843.6  | 857.4  | 702.0  |
| 122.5° | 870.0  | 888.4  | 911.5  | 918.4  | 919.6  |
| 125°   | 935.6  | 950.6  | 972.5  | 980.5  | 984.0  |
| 127.5° | 995.4  | 1011.5 | 1029.0 | 1040.4 | 1041.5 |
| 130°   | 1051.9 | 1070.4 | 1082.9 | 1095.6 | 1094.6 |
| 132.5° | 1109.5 | 1124.5 | 1137.0 | 1147.5 | 1146.3 |
| 135°   | 1157.8 | 1176.3 | 1186.5 | 1198.2 | 1195.8 |
| 137.5° | 1208.3 | 1222.2 | 1233.8 | 1245.3 | 1241.9 |
| 140°   | 1257.8 | 1267.2 | 1279.7 | 1290.1 | 1284.4 |
| 142.5° | 1299.4 | 1307.5 | 1322.4 | 1331.5 | 1325.8 |
| 145°   | 1343.1 | 1341.9 | 1361.4 | 1369.5 | 1363.8 |
| 147.5° | 1381.0 | 1377.5 | 1397.1 | 1402.9 | 1398.4 |
| 150°   | 1417.9 | 1409.9 | 1428.2 | 1435.1 | 1429.4 |
| 152.5° | 1448.9 | 1439.7 | 1457.0 | 1464.0 | 1455.9 |
| 155°   | 1478.8 | 1468.6 | 1482.3 | 1489.2 | 1480.1 |
| 157.5° | 1503.0 | 1493.8 | 1504.2 | 1512.3 | 1503.0 |
| 160°   | 1523.8 | 1516.8 | 1523.8 | 1530.6 | 1522.6 |
| 162.5° | 1542.1 | 1535.3 | 1541.0 | 1549.1 | 1538.7 |
| 165°   | 1558.2 | 1551.4 | 1554.8 | 1562.8 | 1554.8 |
| 167.5° | 1570.9 | 1564.0 | 1567.5 | 1575.6 | 1565.2 |
| 170°   | 1581.3 | 1574.3 | 1576.7 | 1584.7 | 1574.3 |
| 172.5° | 1588.2 | 1581.3 | 1583.7 | 1591.7 | 1581.3 |
| 175°   | 1593.9 | 1585.8 | 1588.2 | 1596.2 | 1584.7 |
| 177.5° | 1596.2 | 1588.2 | 1589.4 | 1597.4 | 1587.1 |
| 180°   | 1590.4 | 1590.4 | 1590.4 | 1590.4 | 1590.4 |

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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 | 13.08            | 14.09 | 13.91 | 14.94 | 15.99 | 12.64          | 13.65 | 13.46 | 14.49 | 15.54 |
|                 | 3H   | 14.75            | 15.65 | 15.59 | 16.51 | 17.59 | 14.26          | 15.16 | 15.10 | 16.02 | 17.10 |
|                 | 4H   | 15.34            | 16.20 | 16.20 | 17.06 | 18.15 | 14.85          | 15.70 | 15.70 | 16.57 | 17.65 |
|                 | 6H   | 15.75            | 16.53 | 16.61 | 17.40 | 18.51 | 15.25          | 16.03 | 16.11 | 16.90 | 18.01 |
|                 | 8H   | 15.85            | 16.60 | 16.73 | 17.49 | 18.59 | 15.35          | 16.10 | 16.23 | 16.99 | 18.09 |
|                 | 12H  | 15.90            | 16.62 | 16.78 | 17.50 | 18.63 | 15.40          | 16.11 | 16.28 | 16.99 | 18.12 |
| 4H              | 2H   | 13.56            | 14.41 | 14.42 | 15.28 | 16.37 | 13.20          | 14.06 | 14.06 | 14.92 | 16.01 |
|                 | 3H   | 15.43            | 16.15 | 16.30 | 17.04 | 18.15 | 15.02          | 15.74 | 15.89 | 16.63 | 17.74 |
|                 | 4H   | 16.15            | 16.80 | 17.03 | 17.69 | 18.82 | 15.73          | 16.37 | 16.61 | 17.27 | 18.40 |
|                 | 6H   | 16.67            | 17.23 | 17.56 | 18.15 | 19.28 | 16.24          | 16.80 | 17.13 | 17.71 | 18.85 |
|                 | 8H   | 16.82            | 17.34 | 17.72 | 18.25 | 19.40 | 16.38          | 16.91 | 17.28 | 17.82 | 18.96 |
|                 | 12H  | 16.90            | 17.37 | 17.82 | 18.30 | 19.45 | 16.45          | 16.92 | 17.37 | 17.85 | 19.00 |
| 8H              | 4H   | 16.35            | 16.88 | 17.25 | 17.79 | 18.94 | 15.98          | 16.50 | 16.88 | 17.41 | 18.56 |
|                 | 6H   | 16.98            | 17.42 | 17.91 | 18.37 | 19.52 | 16.60          | 17.04 | 17.53 | 17.99 | 19.13 |
|                 | 8H   | 17.20            | 17.59 | 18.14 | 18.53 | 19.70 | 16.81          | 17.20 | 17.75 | 18.14 | 19.30 |
|                 | 12H  | 17.34            | 17.68 | 18.28 | 18.61 | 19.83 | 16.93          | 17.27 | 17.87 | 18.20 | 19.42 |
| 12H             | 4H   | 16.34            | 16.82 | 17.26 | 17.75 | 18.90 | 15.98          | 16.45 | 16.90 | 17.38 | 18.53 |
|                 | 6H   | 17.01            | 17.40 | 17.95 | 18.34 | 19.51 | 16.64          | 17.03 | 17.58 | 17.97 | 19.14 |
|                 | 8H   | 17.26            | 17.60 | 18.20 | 18.53 | 19.75 | 16.88          | 17.22 | 17.82 | 18.15 | 19.37 |