

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: P923212

Luminaire Tested: DFN2DIP-SQ4F0-110D060US940-FLLFLL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P923212  
REPORT IS A COMBINATION OF REPORTS P900069 AND P896915  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-SQ4F0-110D060US940-FLLFLL  
Description: 4 foot, Square Define Geo, with Direct Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

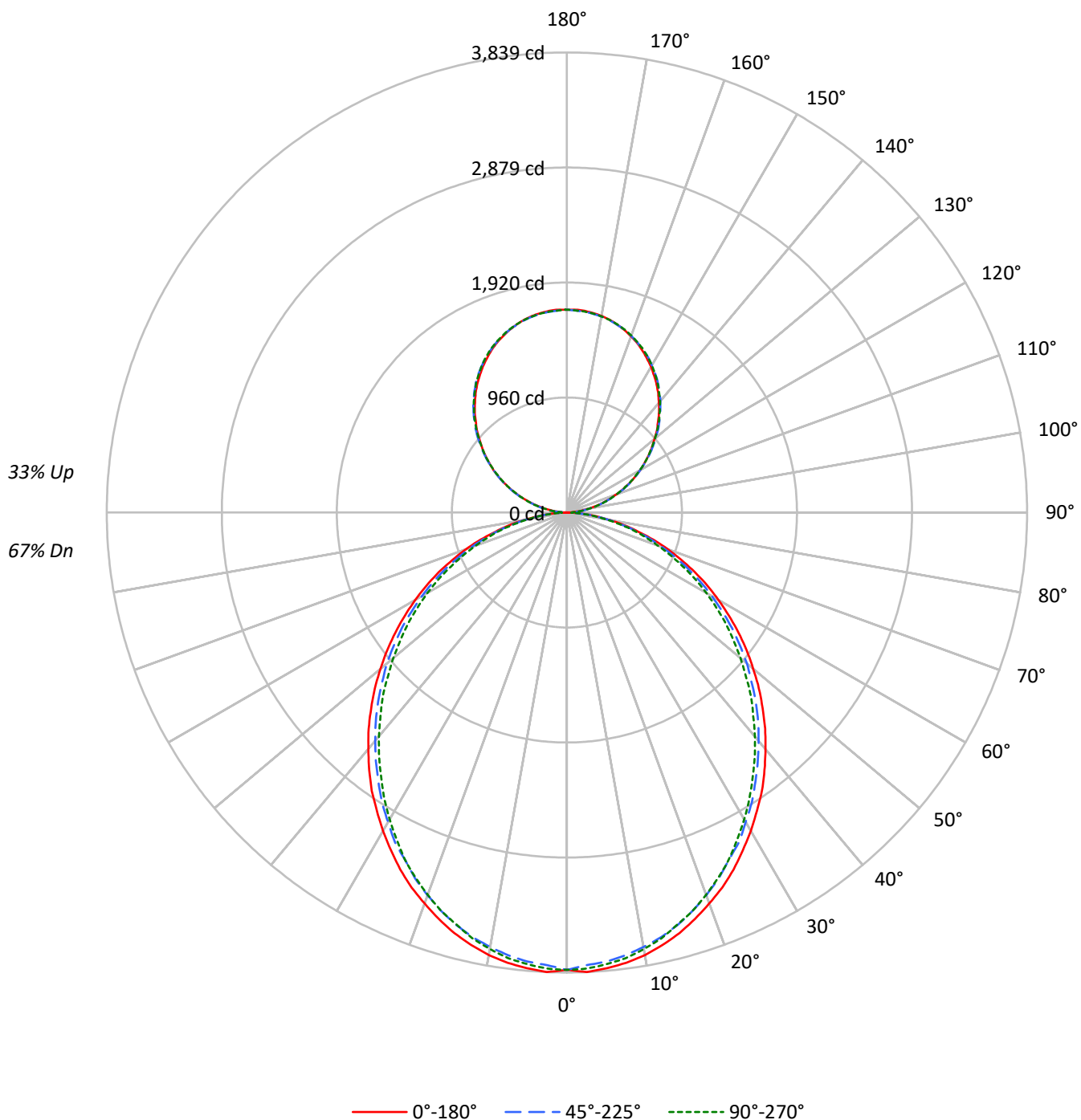
Lumens per Lamp: N/A  
Luminaire Lumens: 14445.7 lumens  
Efficiency: N/A  
Efficacy: 96.1 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 3.92' x L: 3.92' x H: 0.1')  
CIE Type: Semi-Direct

Input Watts (W): 150.3  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9951  
Total Harmonic Distortion (THDi): 0.07  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT

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CATALOG NUMBER: DFN2DIP-SQ4F0-110D060US940-FLLFLL

### Luminous Intensity Polar Plot



TEST NUMBER: P923212

CATALOG NUMBER: DFN2DIP-SQ4F0-110D060US940-FLLFL

**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 |
| RCR |     |     |     |     |     |     |     |     |    |    |    |  |    |    |    |  |    |
| 0   | 111 | 111 | 111 | 111 | 105 | 105 | 105 | 105 | 93 | 93 | 93 |  | 82 | 82 | 82 |  | 72 |
| 1   | 102 | 97  | 93  | 90  | 96  | 92  | 88  | 85  | 82 | 79 | 76 |  | 72 | 70 | 68 |  | 64 |
| 2   | 93  | 85  | 79  | 73  | 87  | 80  | 75  | 70  | 72 | 67 | 63 |  | 63 | 60 | 57 |  | 56 |
| 3   | 85  | 75  | 67  | 61  | 79  | 71  | 64  | 58  | 63 | 58 | 53 |  | 56 | 52 | 48 |  | 50 |
| 4   | 77  | 66  | 58  | 52  | 73  | 63  | 55  | 50  | 56 | 50 | 46 |  | 50 | 45 | 42 |  | 44 |
| 5   | 71  | 59  | 51  | 45  | 67  | 56  | 49  | 43  | 50 | 44 | 39 |  | 45 | 40 | 36 |  | 40 |
| 6   | 66  | 53  | 45  | 39  | 62  | 51  | 43  | 37  | 45 | 39 | 35 |  | 41 | 36 | 32 |  | 36 |
| 7   | 61  | 48  | 40  | 34  | 57  | 46  | 38  | 33  | 41 | 35 | 31 |  | 37 | 32 | 28 |  | 33 |
| 8   | 56  | 44  | 36  | 30  | 53  | 42  | 34  | 29  | 38 | 32 | 27 |  | 34 | 29 | 25 |  | 31 |
| 9   | 53  | 40  | 32  | 27  | 50  | 38  | 31  | 26  | 35 | 29 | 24 |  | 31 | 26 | 23 |  | 28 |
| 10  | 49  | 37  | 29  | 24  | 46  | 35  | 28  | 24  | 32 | 26 | 22 |  | 29 | 24 | 21 |  | 26 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 2678 | 2678 | 2678 |
| 5°  | 2682 | 2641 | 2659 |
| 10° | 2661 | 2606 | 2624 |
| 15° | 2621 | 2564 | 2569 |
| 20° | 2568 | 2505 | 2512 |
| 25° | 2516 | 2434 | 2446 |
| 30° | 2450 | 2368 | 2362 |
| 35° | 2387 | 2291 | 2273 |
| 40° | 2311 | 2212 | 2189 |
| 45° | 2234 | 2133 | 2102 |
| 50° | 2150 | 2051 | 2002 |
| 55° | 2062 | 1956 | 1910 |
| 60° | 1963 | 1842 | 1805 |
| 65° | 1855 | 1725 | 1681 |
| 70° | 1717 | 1582 | 1548 |
| 75° | 1526 | 1411 | 1426 |
| 80° | 1296 | 1194 | 1192 |
| 85° | 937  | 817  | 801  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 2234 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 359.2   | 2.5       |
| 10°-20°   | 1010.7  | 7.0       |
| 20°-30°   | 1485.4  | 10.3      |
| 30°-40°   | 1725.2  | 11.9      |
| 40°-50°   | 1723.0  | 11.9      |
| 50°-60°   | 1502.4  | 10.4      |
| 60°-70°   | 1110.6  | 7.7       |
| 70°-80°   | 628.4   | 4.3       |
| 80°-90°   | 170.7   | 1.2       |
| 90°-100°  | 104.7   | 0.7       |
| 100°-110° | 332.7   | 2.3       |
| 110°-120° | 569.3   | 3.9       |
| 120°-130° | 748.8   | 5.2       |
| 130°-140° | 840.5   | 5.8       |
| 140°-150° | 824.2   | 5.7       |
| 150°-160° | 691.4   | 4.8       |
| 160°-170° | 458.5   | 3.2       |
| 170°-180° | 160.3   | 1.1       |
| 0°-30°    | 2855.3  | 19.8      |
| 0°-40°    | 4580.5  | 31.7      |
| 0°-60°    | 7805.9  | 54.0      |
| 0°-90°    | 9715.6  | 67.3      |
| 90°-120°  | 1006.7  | 7.0       |
| 90°-150°  | 3420.1  | 23.7      |
| 90°-180°  | 4730.0  | 32.7      |
| 0°-180°   | 14445.7 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 3817 | 3817  | 3817 | 3817  | 3817 |      |
| 5°   | 3817 | 3802  | 3762 | 3791  | 3784 | 362  |
| 15°  | 3633 | 3611  | 3564 | 3578  | 3560 | 1023 |
| 25°  | 3288 | 3259  | 3197 | 3204  | 3197 | 1513 |
| 35°  | 2837 | 2800  | 2742 | 2719  | 2701 | 1772 |
| 45°  | 2309 | 2283  | 2228 | 2188  | 2173 | 1782 |
| 55°  | 1747 | 1725  | 1681 | 1637  | 1619 | 1562 |
| 65°  | 1178 | 1156  | 1120 | 1086  | 1068 | 1165 |
| 75°  | 616  | 609   | 591  | 569   | 576  | 658  |
| 85°  | 150  | 147   | 143  | 132   | 128  | 168  |
| 90°  | 2    | 18    | 50   | 47    | 48   | 14   |
| 95°  | 74   | 89    | 91   | 91    | 89   | 83   |
| 105° | 307  | 311   | 314  | 317   | 317  | 324  |
| 115° | 571  | 580   | 577  | 575   | 571  | 565  |
| 125° | 831  | 844   | 840  | 835   | 834  | 743  |
| 135° | 1075 | 1091  | 1094 | 1092  | 1088 | 831  |
| 145° | 1305 | 1315  | 1323 | 1325  | 1319 | 815  |
| 155° | 1492 | 1496  | 1501 | 1508  | 1503 | 687  |
| 165° | 1623 | 1622  | 1622 | 1632  | 1625 | 458  |
| 175° | 1689 | 1685  | 1682 | 1692  | 1683 | 160  |
| 180° | 1692 | 1692  | 1692 | 1692  | 1692 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 3816.7 | 3816.7 | 3816.7 | 3816.7 | 3816.7 |
| 2.5°   | 3838.8 | 3820.5 | 3780.0 | 3816.7 | 3809.7 |
| 5°     | 3816.7 | 3802.3 | 3761.8 | 3790.9 | 3784.0 |
| 7.5°   | 3790.9 | 3769.2 | 3728.7 | 3758.3 | 3750.9 |
| 10°    | 3750.9 | 3725.1 | 3681.2 | 3710.3 | 3699.4 |
| 12.5°  | 3695.6 | 3673.8 | 3629.8 | 3648.1 | 3640.7 |
| 15°    | 3633.3 | 3611.4 | 3563.5 | 3578.3 | 3560.1 |
| 17.5°  | 3556.1 | 3534.4 | 3486.5 | 3504.8 | 3486.5 |
| 20°    | 3471.7 | 3449.8 | 3398.5 | 3409.4 | 3395.0 |
| 22.5°  | 3387.6 | 3354.4 | 3306.6 | 3306.6 | 3299.1 |
| 25°    | 3288.3 | 3259.1 | 3196.8 | 3203.8 | 3196.8 |
| 27.5°  | 3178.1 | 3152.4 | 3104.8 | 3094.0 | 3075.7 |
| 30°    | 3068.3 | 3038.7 | 2983.8 | 2972.9 | 2958.1 |
| 32.5°  | 2950.7 | 2928.9 | 2870.1 | 2847.9 | 2833.1 |
| 35°    | 2837.0 | 2800.4 | 2741.6 | 2719.4 | 2701.1 |
| 37.5°  | 2708.5 | 2675.4 | 2616.6 | 2590.9 | 2572.6 |
| 40°    | 2576.5 | 2546.9 | 2488.1 | 2455.4 | 2440.6 |
| 42.5°  | 2448.0 | 2418.4 | 2360.0 | 2323.0 | 2301.2 |
| 45°    | 2308.6 | 2282.9 | 2227.6 | 2187.5 | 2172.7 |
| 47.5°  | 2172.7 | 2147.1 | 2088.2 | 2047.7 | 2025.9 |
| 50°    | 2029.4 | 2011.2 | 1959.7 | 1908.3 | 1890.1 |
| 52.5°  | 1890.1 | 1864.3 | 1816.9 | 1776.3 | 1750.6 |
| 55°    | 1747.1 | 1724.9 | 1681.0 | 1636.9 | 1618.6 |
| 57.5°  | 1603.8 | 1585.6 | 1537.7 | 1493.6 | 1478.8 |
| 60°    | 1460.5 | 1446.2 | 1394.7 | 1354.2 | 1343.4 |
| 62.5°  | 1321.2 | 1295.5 | 1258.8 | 1222.3 | 1207.5 |
| 65°    | 1178.2 | 1156.0 | 1119.5 | 1086.4 | 1068.1 |
| 67.5°  | 1031.4 | 1012.8 | 980.1  | 954.4  | 939.6  |
| 70°    | 895.5  | 880.7  | 847.7  | 822.0  | 807.5  |
| 72.5°  | 756.2  | 741.4  | 723.1  | 697.4  | 686.4  |
| 75°    | 616.4  | 609.4  | 590.7  | 568.9  | 576.3  |
| 77.5°  | 491.8  | 477.0  | 469.6  | 458.7  | 447.8  |
| 80°    | 367.2  | 363.3  | 355.9  | 345.0  | 337.6  |
| 82.5°  | 249.6  | 249.6  | 246.1  | 231.3  | 231.3  |
| 85°    | 150.3  | 146.8  | 143.3  | 132.0  | 128.5  |
| 87.5°  | 66.2   | 58.8   | 51.4   | 40.5   | 36.6   |
| 90°    | 1.5    | 18.4   | 50.0   | 46.9   | 48.4   |
| 92.5°  | 31.7   | 42.9   | 44.4   | 45.9   | 45.9   |
| 95°    | 74.5   | 88.7   | 91.3   | 91.3   | 88.7   |
| 97.5°  | 123.9  | 137.2  | 142.9  | 142.9  | 142.9  |
| 100°   | 181.1  | 192.8  | 196.9  | 196.9  | 195.4  |
| 102.5° | 241.3  | 249.9  | 255.6  | 257.1  | 255.6  |
| 105°   | 307.1  | 311.2  | 314.2  | 316.8  | 316.8  |
| 107.5° | 372.4  | 378.5  | 378.5  | 379.5  | 372.4  |
| 110°   | 435.7  | 443.8  | 443.8  | 443.8  | 439.7  |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 504.0  | 512.6  | 511.1  | 507.0  | 504.0  |
| 115°   | 571.3  | 579.5  | 576.9  | 575.4  | 571.3  |
| 117.5° | 638.2  | 649.4  | 642.2  | 638.2  | 634.1  |
| 120°   | 705.5  | 716.8  | 705.5  | 705.5  | 700.9  |
| 122.5° | 766.7  | 781.0  | 773.8  | 769.8  | 766.7  |
| 125°   | 831.0  | 843.7  | 839.6  | 835.1  | 833.6  |
| 127.5° | 893.8  | 909.5  | 903.9  | 897.9  | 893.8  |
| 130°   | 952.4  | 970.8  | 968.2  | 965.2  | 959.6  |
| 132.5° | 1018.2 | 1032.5 | 1033.5 | 1026.4 | 1022.3 |
| 135°   | 1074.9 | 1090.7 | 1093.7 | 1092.2 | 1088.1 |
| 137.5° | 1138.1 | 1150.8 | 1153.4 | 1152.4 | 1146.3 |
| 140°   | 1193.7 | 1206.5 | 1213.6 | 1213.6 | 1208.0 |
| 142.5° | 1250.8 | 1263.6 | 1267.7 | 1269.2 | 1263.6 |
| 145°   | 1304.9 | 1315.1 | 1323.3 | 1324.8 | 1319.2 |
| 147.5° | 1353.3 | 1366.1 | 1372.3 | 1374.7 | 1369.1 |
| 150°   | 1403.4 | 1412.0 | 1417.6 | 1422.2 | 1417.6 |
| 152.5° | 1447.7 | 1456.4 | 1463.6 | 1469.2 | 1463.6 |
| 155°   | 1492.1 | 1496.2 | 1500.7 | 1508.0 | 1503.3 |
| 157.5° | 1530.4 | 1533.5 | 1536.0 | 1546.2 | 1539.1 |
| 160°   | 1564.6 | 1567.6 | 1569.1 | 1577.8 | 1571.7 |
| 162.5° | 1596.2 | 1596.2 | 1597.7 | 1607.4 | 1600.3 |
| 165°   | 1623.2 | 1621.7 | 1621.7 | 1631.9 | 1624.8 |
| 167.5° | 1647.7 | 1643.2 | 1643.2 | 1653.3 | 1646.2 |
| 170°   | 1666.1 | 1662.0 | 1660.5 | 1670.6 | 1662.0 |
| 172.5° | 1678.8 | 1674.7 | 1673.2 | 1683.4 | 1674.7 |
| 175°   | 1689.0 | 1685.0 | 1681.9 | 1692.1 | 1683.4 |
| 177.5° | 1694.6 | 1690.6 | 1687.5 | 1696.1 | 1687.5 |
| 180°   | 1692.1 | 1692.1 | 1692.1 | 1692.1 | 1692.1 |

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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 | 12.16            | 13.20 | 12.96 | 14.02 | 15.02 | 11.72          | 12.76 | 12.51 | 13.58 | 14.58 |
|                 | 3H   | 13.84            | 14.78 | 14.65 | 15.60 | 16.63 | 13.35          | 14.29 | 14.16 | 15.11 | 16.14 |
|                 | 4H   | 14.44            | 15.32 | 15.26 | 16.16 | 17.20 | 13.95          | 14.83 | 14.77 | 15.66 | 16.70 |
|                 | 6H   | 14.85            | 15.67 | 15.69 | 16.51 | 17.56 | 14.35          | 15.17 | 15.19 | 16.01 | 17.06 |
|                 | 8H   | 14.96            | 15.74 | 15.81 | 16.60 | 17.66 | 14.46          | 15.24 | 15.31 | 16.10 | 17.15 |
|                 | 12H  | 15.02            | 15.76 | 15.87 | 16.61 | 17.70 | 14.51          | 15.25 | 15.36 | 16.10 | 17.19 |
| 4H              | 2H   | 12.65            | 13.53 | 13.47 | 14.36 | 15.40 | 12.29          | 13.17 | 13.12 | 14.01 | 15.05 |
|                 | 3H   | 14.53            | 15.27 | 15.37 | 16.14 | 17.20 | 14.13          | 14.86 | 14.97 | 15.73 | 16.79 |
|                 | 4H   | 15.26            | 15.93 | 16.11 | 16.79 | 17.88 | 14.83          | 15.51 | 15.69 | 16.37 | 17.46 |
|                 | 6H   | 15.79            | 16.37 | 16.66 | 17.26 | 18.35 | 15.36          | 15.94 | 16.22 | 16.83 | 17.91 |
|                 | 8H   | 15.94            | 16.49 | 16.82 | 17.37 | 18.47 | 15.51          | 16.05 | 16.38 | 16.93 | 18.03 |
|                 | 12H  | 16.03            | 16.52 | 16.92 | 17.42 | 18.53 | 15.58          | 16.07 | 16.47 | 16.97 | 18.08 |
| 8H              | 4H   | 15.47            | 16.01 | 16.34 | 16.90 | 18.00 | 15.09          | 15.64 | 15.96 | 16.52 | 17.62 |
|                 | 6H   | 16.11            | 16.56 | 17.01 | 17.49 | 18.59 | 15.73          | 16.18 | 16.63 | 17.11 | 18.21 |
|                 | 8H   | 16.34            | 16.74 | 17.25 | 17.66 | 18.77 | 15.95          | 16.35 | 16.86 | 17.26 | 18.38 |
|                 | 12H  | 16.48            | 16.83 | 17.39 | 17.74 | 18.91 | 16.07          | 16.42 | 16.98 | 17.33 | 18.50 |
| 12H             | 4H   | 15.46            | 15.95 | 16.36 | 16.86 | 17.96 | 15.10          | 15.59 | 15.99 | 16.49 | 17.60 |
|                 | 6H   | 16.14            | 16.54 | 17.05 | 17.46 | 18.58 | 15.77          | 16.17 | 16.68 | 17.09 | 18.21 |
|                 | 8H   | 16.40            | 16.75 | 17.31 | 17.66 | 18.83 | 16.02          | 16.37 | 16.93 | 17.28 | 18.45 |