

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: P917564

Luminaire Tested: DFN2DIP-SQ3F0-120D100US930-FLLFLL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P917564  
REPORT IS A COMBINATION OF REPORTS P899985 AND P896733  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-SQ3F0-120D100US930-FLLFLL  
Description: 3 foot, Square Define Geo, with Direct Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

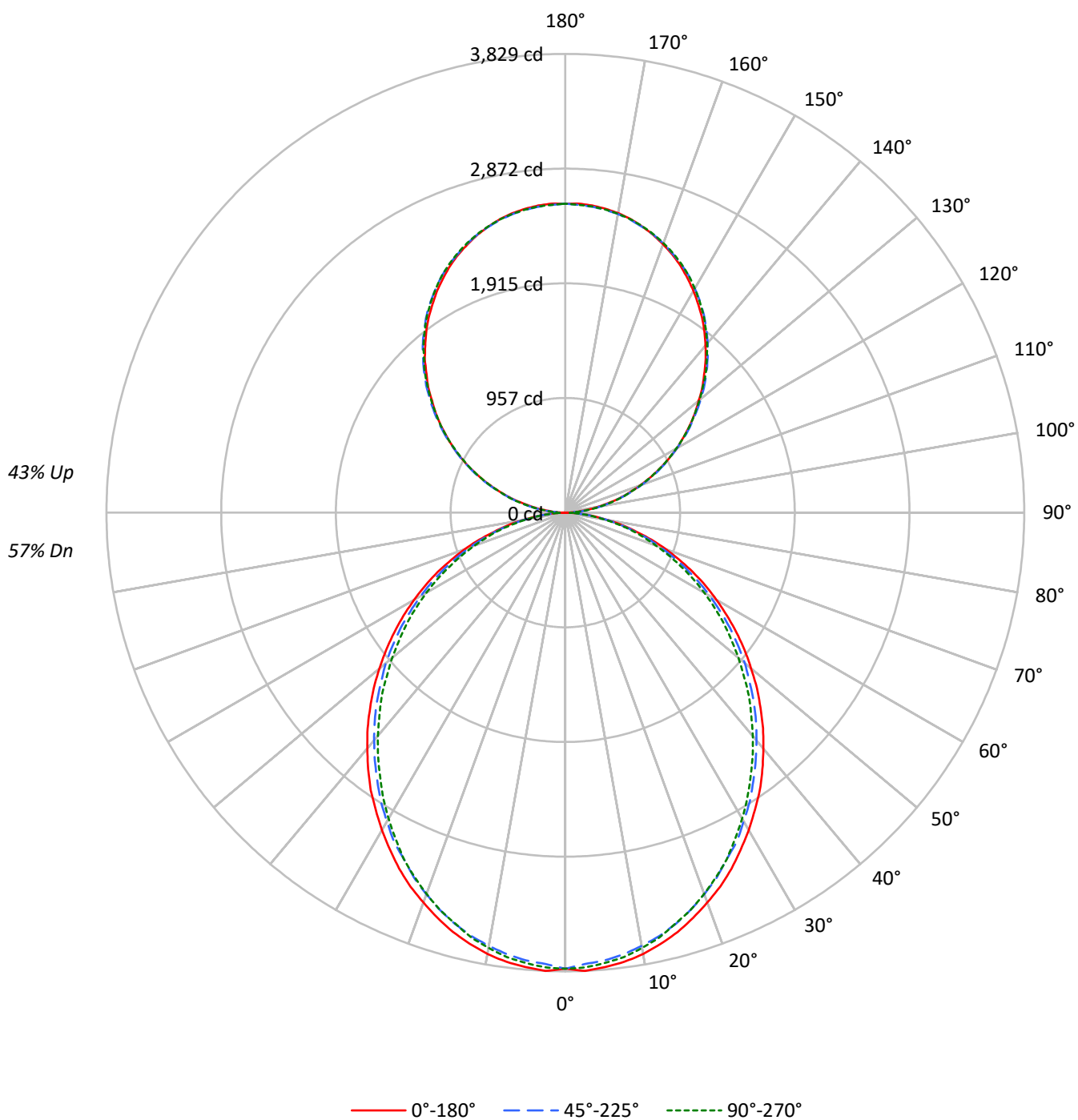
Lumens per Lamp: N/A  
Luminaire Lumens: 16901.1 lumens  
Efficiency: N/A  
Efficacy: 83.1 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 3.06' x L: 3.06' x H: 0.1')  
CIE Type: General Diffuse

Input Watts (W): 203.3  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9957  
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



TEST NUMBER: P917564

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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   | 109 | 109 | 109 | 109 | 101 | 101 | 101 | 101 | 87 | 87 | 87 | 75 | 75 | 75 | 63 | 63 | 63 |
| 1   | 99  | 95  | 91  | 88  | 92  | 89  | 85  | 82  | 77 | 74 | 72 | 66 | 64 | 62 | 56 | 54 | 53 |
| 2   | 91  | 83  | 77  | 72  | 84  | 78  | 72  | 67  | 67 | 63 | 60 | 58 | 55 | 52 | 49 | 47 | 45 |
| 3   | 83  | 73  | 66  | 60  | 77  | 68  | 62  | 56  | 59 | 54 | 50 | 51 | 47 | 44 | 43 | 41 | 38 |
| 4   | 76  | 65  | 57  | 51  | 70  | 61  | 53  | 48  | 53 | 47 | 43 | 46 | 41 | 38 | 39 | 36 | 33 |
| 5   | 69  | 58  | 49  | 43  | 64  | 54  | 47  | 41  | 47 | 41 | 37 | 41 | 36 | 33 | 35 | 31 | 29 |
| 6   | 64  | 52  | 44  | 38  | 59  | 49  | 41  | 36  | 43 | 37 | 32 | 37 | 32 | 29 | 32 | 28 | 25 |
| 7   | 59  | 47  | 39  | 33  | 55  | 44  | 37  | 32  | 39 | 33 | 28 | 34 | 29 | 25 | 29 | 25 | 22 |
| 8   | 55  | 43  | 35  | 29  | 51  | 40  | 33  | 28  | 35 | 29 | 25 | 31 | 26 | 23 | 27 | 23 | 20 |
| 9   | 51  | 39  | 31  | 26  | 48  | 37  | 30  | 25  | 32 | 27 | 23 | 28 | 24 | 20 | 25 | 21 | 18 |
| 10  | 48  | 36  | 28  | 24  | 45  | 34  | 27  | 23  | 30 | 24 | 21 | 26 | 22 | 19 | 23 | 19 | 17 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 4362 | 4362 | 4362 |
| 5°  | 4366 | 4298 | 4329 |
| 10° | 4328 | 4237 | 4269 |
| 15° | 4261 | 4165 | 4176 |
| 20° | 4173 | 4065 | 4081 |
| 25° | 4084 | 3946 | 3971 |
| 30° | 3974 | 3835 | 3832 |
| 35° | 3870 | 3705 | 3684 |
| 40° | 3741 | 3574 | 3544 |
| 45° | 3613 | 3442 | 3401 |
| 50° | 3473 | 3303 | 3235 |
| 55° | 3326 | 3142 | 3082 |
| 60° | 3160 | 2952 | 2906 |
| 65° | 2978 | 2755 | 2700 |
| 70° | 2746 | 2514 | 2477 |
| 75° | 2426 | 2225 | 2268 |
| 80° | 2039 | 1857 | 1875 |
| 85° | 1435 | 1230 | 1228 |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 3613 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 358.3   | 2.1       |
| 10°-20°   | 1008.1  | 6.0       |
| 20°-30°   | 1481.5  | 8.8       |
| 30°-40°   | 1720.7  | 10.2      |
| 40°-50°   | 1718.6  | 10.2      |
| 50°-60°   | 1498.5  | 8.9       |
| 60°-70°   | 1107.8  | 6.6       |
| 70°-80°   | 626.7   | 3.7       |
| 80°-90°   | 172.7   | 1.0       |
| 90°-100°  | 159.6   | 0.9       |
| 100°-110° | 507.0   | 3.0       |
| 110°-120° | 867.6   | 5.1       |
| 120°-130° | 1141.0  | 6.8       |
| 130°-140° | 1280.7  | 7.6       |
| 140°-150° | 1255.9  | 7.4       |
| 150°-160° | 1053.5  | 6.2       |
| 160°-170° | 698.7   | 4.1       |
| 170°-180° | 244.2   | 1.4       |
| 0°-30°    | 2848.0  | 16.9      |
| 0°-40°    | 4568.7  | 27.0      |
| 0°-60°    | 7785.8  | 46.1      |
| 0°-90°    | 9693.1  | 57.4      |
| 90°-120°  | 1534.1  | 9.1       |
| 90°-150°  | 5211.7  | 30.8      |
| 90°-180°  | 7208.0  | 42.6      |
| 0°-180°   | 16901.1 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 3807 | 3807  | 3807 | 3807  | 3807 |      |
| 5°   | 3807 | 3792  | 3752 | 3781  | 3774 | 361  |
| 15°  | 3624 | 3602  | 3554 | 3569  | 3551 | 1021 |
| 25°  | 3280 | 3251  | 3188 | 3196  | 3188 | 1509 |
| 35°  | 2830 | 2793  | 2734 | 2712  | 2694 | 1767 |
| 45°  | 2303 | 2277  | 2222 | 2182  | 2167 | 1777 |
| 55°  | 1743 | 1720  | 1677 | 1633  | 1614 | 1558 |
| 65°  | 1175 | 1153  | 1117 | 1084  | 1065 | 1162 |
| 75°  | 615  | 608   | 589  | 567   | 575  | 656  |
| 85°  | 150  | 146   | 143  | 132   | 128  | 167  |
| 90°  | 2    | 28    | 76   | 72    | 74   | 16   |
| 95°  | 114  | 135   | 139  | 139   | 135  | 126  |
| 105° | 468  | 474   | 479  | 483   | 483  | 494  |
| 115° | 871  | 883   | 879  | 877   | 871  | 861  |
| 125° | 1266 | 1286  | 1280 | 1272  | 1270 | 1132 |
| 135° | 1638 | 1662  | 1667 | 1664  | 1658 | 1266 |
| 145° | 1988 | 2004  | 2016 | 2019  | 2010 | 1242 |
| 155° | 2274 | 2280  | 2287 | 2298  | 2291 | 1047 |
| 165° | 2474 | 2471  | 2471 | 2487  | 2476 | 698  |
| 175° | 2574 | 2568  | 2563 | 2578  | 2565 | 245  |
| 180° | 2578 | 2578  | 2578 | 2578  | 2578 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 3806.9 | 3806.9 | 3806.9 | 3806.9 | 3806.9 |
| 2.5°   | 3829.0 | 3810.7 | 3770.3 | 3806.9 | 3799.9 |
| 5°     | 3806.9 | 3792.4 | 3752.1 | 3781.2 | 3774.2 |
| 7.5°   | 3781.2 | 3759.4 | 3719.1 | 3748.6 | 3741.2 |
| 10°    | 3741.2 | 3715.6 | 3671.7 | 3700.8 | 3690.0 |
| 12.5°  | 3686.0 | 3664.3 | 3620.4 | 3638.7 | 3631.3 |
| 15°    | 3623.9 | 3602.2 | 3554.4 | 3569.1 | 3550.9 |
| 17.5°  | 3547.0 | 3525.3 | 3477.5 | 3495.8 | 3477.5 |
| 20°    | 3462.7 | 3441.0 | 3389.8 | 3400.6 | 3386.3 |
| 22.5°  | 3378.8 | 3345.8 | 3298.0 | 3298.0 | 3290.7 |
| 25°    | 3279.8 | 3250.7 | 3188.5 | 3195.6 | 3188.5 |
| 27.5°  | 3169.9 | 3144.3 | 3096.9 | 3086.0 | 3067.8 |
| 30°    | 3060.4 | 3030.9 | 2976.1 | 2965.2 | 2950.5 |
| 32.5°  | 2943.1 | 2921.4 | 2862.7 | 2840.6 | 2825.8 |
| 35°    | 2829.7 | 2793.2 | 2734.5 | 2712.4 | 2694.2 |
| 37.5°  | 2701.5 | 2668.6 | 2609.9 | 2584.3 | 2566.0 |
| 40°    | 2569.9 | 2540.4 | 2481.7 | 2449.1 | 2434.3 |
| 42.5°  | 2441.7 | 2412.2 | 2353.9 | 2317.1 | 2295.3 |
| 45°    | 2302.6 | 2277.0 | 2221.9 | 2181.9 | 2167.1 |
| 47.5°  | 2167.1 | 2141.5 | 2082.8 | 2042.5 | 2020.7 |
| 50°    | 2024.2 | 2006.0 | 1954.7 | 1903.4 | 1885.1 |
| 52.5°  | 1885.1 | 1859.5 | 1812.2 | 1771.7 | 1746.1 |
| 55°    | 1742.6 | 1720.5 | 1676.6 | 1632.7 | 1614.5 |
| 57.5°  | 1599.7 | 1581.4 | 1533.7 | 1489.8 | 1475.0 |
| 60°    | 1456.8 | 1442.4 | 1391.1 | 1350.8 | 1339.9 |
| 62.5°  | 1317.8 | 1292.1 | 1255.6 | 1219.1 | 1204.4 |
| 65°    | 1175.3 | 1153.1 | 1116.6 | 1083.5 | 1065.4 |
| 67.5°  | 1028.8 | 1010.2 | 977.5  | 951.9  | 937.2  |
| 70°    | 893.2  | 878.5  | 845.5  | 819.9  | 805.5  |
| 72.5°  | 754.2  | 739.5  | 721.2  | 695.6  | 684.7  |
| 75°    | 614.8  | 607.8  | 589.1  | 567.4  | 574.8  |
| 77.5°  | 490.5  | 475.7  | 468.4  | 457.5  | 446.6  |
| 80°    | 366.2  | 362.3  | 355.0  | 344.1  | 336.7  |
| 82.5°  | 248.9  | 248.9  | 245.5  | 230.7  | 230.7  |
| 85°    | 149.9  | 146.4  | 142.9  | 131.7  | 128.2  |
| 87.5°  | 66.0   | 58.6   | 51.3   | 40.4   | 36.5   |
| 90°    | 2.4    | 28.0   | 76.1   | 71.5   | 73.9   |
| 92.5°  | 48.2   | 65.3   | 67.7   | 70.0   | 70.0   |
| 95°    | 113.5  | 135.3  | 139.2  | 139.2  | 135.3  |
| 97.5°  | 188.9  | 209.1  | 217.7  | 217.7  | 217.7  |
| 100°   | 276.0  | 293.8  | 300.0  | 300.0  | 297.7  |
| 102.5° | 367.7  | 380.9  | 389.5  | 391.8  | 389.5  |
| 105°   | 468.0  | 474.2  | 478.8  | 482.7  | 482.7  |
| 107.5° | 567.4  | 576.8  | 576.8  | 578.4  | 567.4  |
| 110°   | 663.9  | 676.3  | 676.3  | 676.3  | 670.1  |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 768.0  | 781.2  | 778.9  | 772.7  | 768.0  |
| 115°   | 870.7  | 883.0  | 879.2  | 876.9  | 870.7  |
| 117.5° | 972.5  | 989.6  | 978.7  | 972.5  | 966.2  |
| 120°   | 1075.1 | 1092.2 | 1075.1 | 1075.1 | 1068.1 |
| 122.5° | 1168.3 | 1190.1 | 1179.2 | 1173.1 | 1168.3 |
| 125°   | 1266.3 | 1285.7 | 1279.5 | 1272.5 | 1270.2 |
| 127.5° | 1362.0 | 1386.0 | 1377.4 | 1368.2 | 1362.0 |
| 130°   | 1451.3 | 1479.3 | 1475.4 | 1470.7 | 1462.2 |
| 132.5° | 1551.6 | 1573.4 | 1574.9 | 1564.1 | 1557.8 |
| 135°   | 1637.9 | 1662.0 | 1666.6 | 1664.3 | 1658.1 |
| 137.5° | 1734.3 | 1753.7 | 1757.6 | 1756.1 | 1746.7 |
| 140°   | 1819.0 | 1838.4 | 1849.3 | 1849.3 | 1840.8 |
| 142.5° | 1906.1 | 1925.5 | 1931.7 | 1934.1 | 1925.5 |
| 145°   | 1988.4 | 2004.0 | 2016.5 | 2018.8 | 2010.2 |
| 147.5° | 2062.3 | 2081.8 | 2091.1 | 2095.0 | 2086.4 |
| 150°   | 2138.5 | 2151.7 | 2160.3 | 2167.2 | 2160.3 |
| 152.5° | 2206.1 | 2219.3 | 2230.2 | 2238.8 | 2230.2 |
| 155°   | 2273.8 | 2280.0 | 2287.0 | 2297.8 | 2290.8 |
| 157.5° | 2332.1 | 2336.7 | 2340.6 | 2356.1 | 2345.3 |
| 160°   | 2384.2 | 2388.8 | 2391.1 | 2404.3 | 2395.0 |
| 162.5° | 2432.4 | 2432.4 | 2434.6 | 2449.4 | 2438.6 |
| 165°   | 2473.5 | 2471.2 | 2471.2 | 2486.7 | 2475.9 |
| 167.5° | 2510.9 | 2503.9 | 2503.9 | 2519.4 | 2508.5 |
| 170°   | 2538.8 | 2532.6 | 2530.3 | 2545.9 | 2532.6 |
| 172.5° | 2558.2 | 2552.0 | 2549.7 | 2565.3 | 2552.0 |
| 175°   | 2573.8 | 2567.6 | 2563.0 | 2578.5 | 2565.3 |
| 177.5° | 2582.4 | 2576.2 | 2571.5 | 2584.7 | 2571.5 |
| 180°   | 2578.5 | 2578.5 | 2578.5 | 2578.5 | 2578.5 |

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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 | 13.01            | 13.94 | 13.90 | 14.85 | 16.01 | 12.56          | 13.49 | 13.45 | 14.41 | 15.57 |
|                 | 3H   | 14.67            | 15.50 | 15.57 | 16.42 | 17.61 | 14.18          | 15.01 | 15.08 | 15.93 | 17.12 |
|                 | 4H   | 15.26            | 16.05 | 16.17 | 16.97 | 18.17 | 14.76          | 15.55 | 15.68 | 16.48 | 17.68 |
|                 | 6H   | 15.66            | 16.38 | 16.59 | 17.32 | 18.53 | 15.16          | 15.88 | 16.09 | 16.82 | 18.03 |
|                 | 8H   | 15.76            | 16.45 | 16.70 | 17.40 | 18.61 | 15.26          | 15.95 | 16.20 | 16.90 | 18.11 |
|                 | 12H  | 15.81            | 16.47 | 16.75 | 17.41 | 18.65 | 15.30          | 15.96 | 16.24 | 16.90 | 18.14 |
| 4H              | 2H   | 13.47            | 14.26 | 14.40 | 15.19 | 16.39 | 13.12          | 13.91 | 14.04 | 14.83 | 16.03 |
|                 | 3H   | 15.34            | 16.00 | 16.27 | 16.96 | 18.17 | 14.93          | 15.59 | 15.87 | 16.55 | 17.76 |
|                 | 4H   | 16.05            | 16.65 | 17.00 | 17.61 | 18.84 | 15.63          | 16.23 | 16.57 | 17.18 | 18.42 |
|                 | 6H   | 16.57            | 17.09 | 17.52 | 18.06 | 19.30 | 16.13          | 16.65 | 17.09 | 17.63 | 18.87 |
|                 | 8H   | 16.72            | 17.20 | 17.68 | 18.17 | 19.42 | 16.28          | 16.76 | 17.24 | 17.73 | 18.98 |
|                 | 12H  | 16.79            | 17.23 | 17.77 | 18.21 | 19.47 | 16.34          | 16.78 | 17.32 | 17.77 | 19.02 |
| 8H              | 4H   | 16.25            | 16.74 | 17.21 | 17.71 | 18.96 | 15.87          | 16.36 | 16.83 | 17.33 | 18.58 |
|                 | 6H   | 16.88            | 17.28 | 17.86 | 18.29 | 19.54 | 16.49          | 16.90 | 17.48 | 17.91 | 19.16 |
|                 | 8H   | 17.10            | 17.45 | 18.09 | 18.45 | 19.72 | 16.70          | 17.06 | 17.70 | 18.06 | 19.33 |
|                 | 12H  | 17.23            | 17.54 | 18.23 | 18.53 | 19.85 | 16.82          | 17.13 | 17.82 | 18.12 | 19.44 |
| 12H             | 4H   | 16.24            | 16.68 | 17.22 | 17.66 | 18.92 | 15.87          | 16.31 | 16.85 | 17.29 | 18.55 |
|                 | 6H   | 16.91            | 17.26 | 17.90 | 18.26 | 19.53 | 16.53          | 16.89 | 17.53 | 17.89 | 19.16 |
|                 | 8H   | 17.15            | 17.46 | 18.15 | 18.45 | 19.77 | 16.77          | 17.08 | 17.77 | 18.07 | 19.39 |