

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: P912108

Luminaire Tested: DFN2DIP-SQ3F0-120D100US850-FLLFLL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P912108  
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-SQ3F0-120D100US850-FLLFLL  
Description: 3 foot, Square Define Geo, with Direct Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

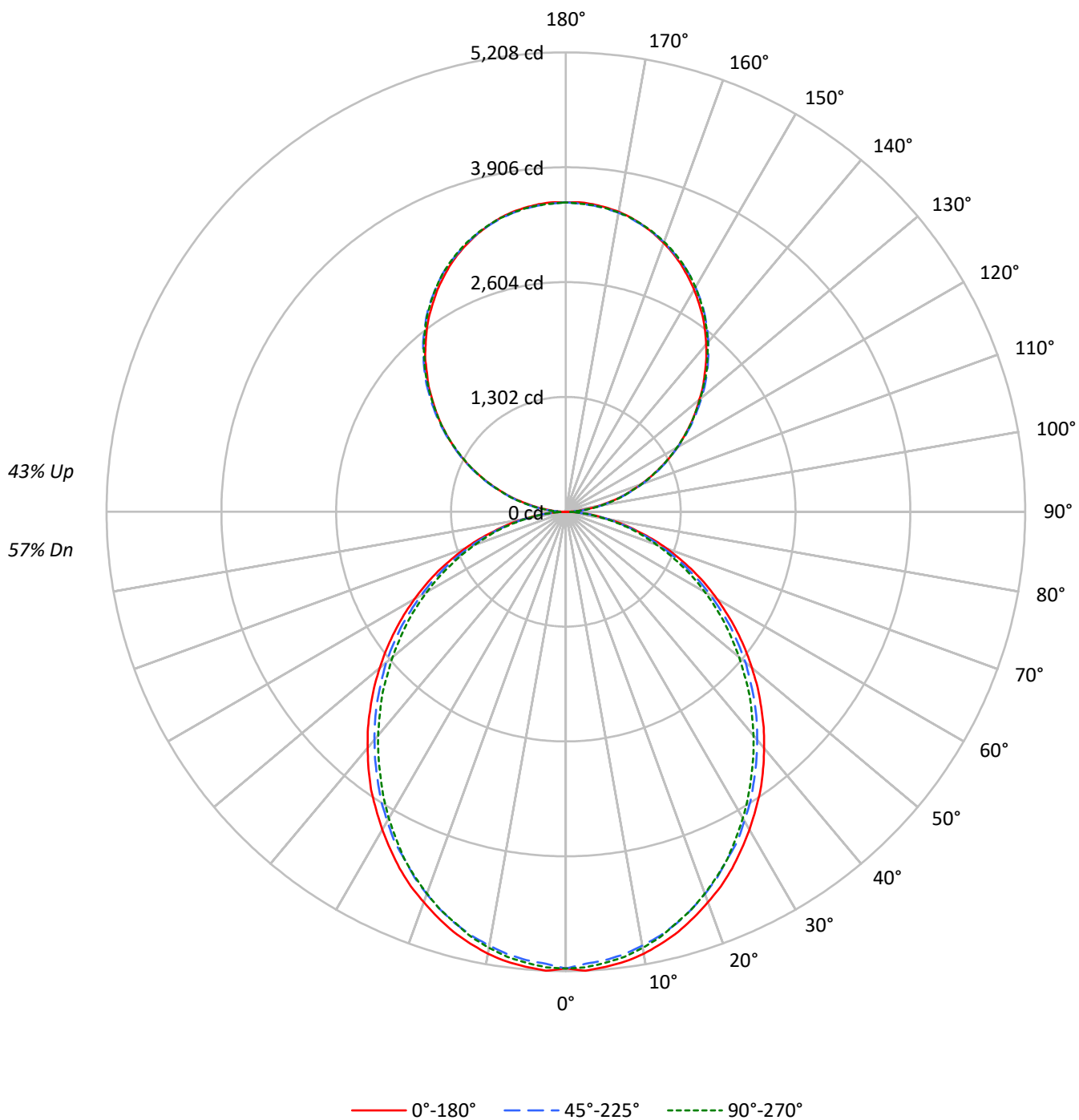
Lumens per Lamp: N/A  
Luminaire Lumens: 22989.6 lumens  
Efficiency: N/A  
Efficacy: 113.1 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 3.06' x L: 3.06' x H: 0.1')  
CIE Type: General Diffuse

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: P912108

CATALOG NUMBER: DFN2DIP-SQ3F0-120D100US850-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 | 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°  | 5933 | 5933 | 5933 |
| 5°  | 5939 | 5847 | 5888 |
| 10° | 5887 | 5764 | 5806 |
| 15° | 5797 | 5665 | 5680 |
| 20° | 5676 | 5529 | 5550 |
| 25° | 5556 | 5368 | 5401 |
| 30° | 5406 | 5217 | 5212 |
| 35° | 5264 | 5040 | 5012 |
| 40° | 5089 | 4861 | 4821 |
| 45° | 4915 | 4681 | 4626 |
| 50° | 4724 | 4492 | 4400 |
| 55° | 4524 | 4274 | 4192 |
| 60° | 4298 | 4015 | 3953 |
| 65° | 4051 | 3747 | 3672 |
| 70° | 3736 | 3419 | 3369 |
| 75° | 3300 | 3027 | 3085 |
| 80° | 2774 | 2526 | 2550 |
| 85° | 1952 | 1673 | 1669 |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 4915 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 487.4   | 2.1       |
| 10°-20°   | 1371.3  | 6.0       |
| 20°-30°   | 2015.2  | 8.8       |
| 30°-40°   | 2340.6  | 10.2      |
| 40°-50°   | 2337.7  | 10.2      |
| 50°-60°   | 2038.4  | 8.9       |
| 60°-70°   | 1506.8  | 6.6       |
| 70°-80°   | 852.5   | 3.7       |
| 80°-90°   | 235.0   | 1.0       |
| 90°-100°  | 217.0   | 0.9       |
| 100°-110° | 689.6   | 3.0       |
| 110°-120° | 1180.1  | 5.1       |
| 120°-130° | 1552.0  | 6.8       |
| 130°-140° | 1742.1  | 7.6       |
| 140°-150° | 1708.3  | 7.4       |
| 150°-160° | 1433.0  | 6.2       |
| 160°-170° | 950.4   | 4.1       |
| 170°-180° | 332.2   | 1.4       |
| 0°-30°    | 3873.9  | 16.9      |
| 0°-40°    | 6214.5  | 27.0      |
| 0°-60°    | 10590.5 | 46.1      |
| 0°-90°    | 13184.9 | 57.4      |
| 90°-120°  | 2086.7  | 9.1       |
| 90°-150°  | 7089.1  | 30.8      |
| 90°-180°  | 9805.0  | 42.6      |
| 0°-180°   | 22989.6 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 5178 | 5178  | 5178 | 5178  | 5178 |      |
| 5°   | 5178 | 5159  | 5104 | 5143  | 5134 | 492  |
| 15°  | 4929 | 4900  | 4835 | 4855  | 4830 | 1388 |
| 25°  | 4461 | 4422  | 4337 | 4347  | 4337 | 2053 |
| 35°  | 3849 | 3799  | 3720 | 3690  | 3665 | 2404 |
| 45°  | 3132 | 3097  | 3022 | 2968  | 2948 | 2417 |
| 55°  | 2370 | 2340  | 2280 | 2221  | 2196 | 2119 |
| 65°  | 1599 | 1568  | 1519 | 1474  | 1449 | 1581 |
| 75°  | 836  | 827   | 801  | 772   | 782  | 893  |
| 85°  | 204  | 199   | 194  | 179   | 174  | 227  |
| 90°  | 3    | 38    | 104  | 97    | 100  | 22   |
| 95°  | 154  | 184   | 189  | 189   | 184  | 172  |
| 105° | 637  | 645   | 651  | 657   | 657  | 672  |
| 115° | 1184 | 1201  | 1196 | 1193  | 1184 | 1171 |
| 125° | 1722 | 1749  | 1740 | 1731  | 1728 | 1539 |
| 135° | 2228 | 2261  | 2267 | 2264  | 2255 | 1722 |
| 145° | 2705 | 2726  | 2743 | 2746  | 2734 | 1690 |
| 155° | 3093 | 3101  | 3111 | 3126  | 3116 | 1424 |
| 165° | 3365 | 3361  | 3361 | 3383  | 3368 | 949  |
| 175° | 3501 | 3493  | 3486 | 3507  | 3489 | 333  |
| 180° | 3507 | 3507  | 3507 | 3507  | 3507 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 5178.3 | 5178.3 | 5178.3 | 5178.3 | 5178.3 |
| 2.5°   | 5208.3 | 5183.5 | 5128.6 | 5178.3 | 5168.7 |
| 5°     | 5178.3 | 5158.6 | 5103.7 | 5143.3 | 5133.8 |
| 7.5°   | 5143.3 | 5113.7 | 5058.8 | 5099.0 | 5089.0 |
| 10°    | 5089.0 | 5054.0 | 4994.4 | 5034.0 | 5019.2 |
| 12.5°  | 5013.9 | 4984.3 | 4924.6 | 4949.5 | 4939.4 |
| 15°    | 4929.4 | 4899.8 | 4834.8 | 4854.9 | 4830.0 |
| 17.5°  | 4824.8 | 4795.2 | 4730.2 | 4755.1 | 4730.2 |
| 20°    | 4710.1 | 4680.5 | 4610.9 | 4625.6 | 4606.1 |
| 22.5°  | 4596.0 | 4551.1 | 4486.1 | 4486.1 | 4476.1 |
| 25°    | 4461.3 | 4421.7 | 4337.2 | 4346.7 | 4337.2 |
| 27.5°  | 4311.8 | 4277.0 | 4212.5 | 4197.7 | 4172.9 |
| 30°    | 4162.9 | 4122.7 | 4048.2 | 4033.4 | 4013.4 |
| 32.5°  | 4003.3 | 3973.8 | 3893.9 | 3863.9 | 3843.8 |
| 35°    | 3849.0 | 3799.4 | 3719.6 | 3689.5 | 3664.7 |
| 37.5°  | 3674.7 | 3629.9 | 3550.0 | 3515.2 | 3490.4 |
| 40°    | 3495.7 | 3455.5 | 3375.7 | 3331.3 | 3311.3 |
| 42.5°  | 3321.3 | 3281.2 | 3201.9 | 3151.8 | 3122.2 |
| 45°    | 3132.1 | 3097.3 | 3022.2 | 2967.9 | 2947.8 |
| 47.5°  | 2947.8 | 2912.9 | 2833.2 | 2778.3 | 2748.7 |
| 50°    | 2753.4 | 2728.6 | 2658.8 | 2589.1 | 2564.2 |
| 52.5°  | 2564.2 | 2529.4 | 2465.0 | 2410.0 | 2375.1 |
| 55°    | 2370.4 | 2340.3 | 2280.5 | 2220.9 | 2196.0 |
| 57.5°  | 2176.0 | 2151.1 | 2086.1 | 2026.5 | 2006.4 |
| 60°    | 1981.6 | 1962.0 | 1892.3 | 1837.4 | 1822.5 |
| 62.5°  | 1792.5 | 1757.5 | 1708.0 | 1658.3 | 1638.2 |
| 65°    | 1598.6 | 1568.5 | 1518.8 | 1473.9 | 1449.1 |
| 67.5°  | 1399.4 | 1374.1 | 1329.7 | 1294.9 | 1274.8 |
| 70°    | 1215.0 | 1194.9 | 1150.0 | 1115.2 | 1095.7 |
| 72.5°  | 1025.9 | 1005.9 | 981.0  | 946.2  | 931.3  |
| 75°    | 836.3  | 826.8  | 801.4  | 771.9  | 781.8  |
| 77.5°  | 667.2  | 647.1  | 637.1  | 622.3  | 607.5  |
| 80°    | 498.2  | 492.8  | 482.9  | 468.1  | 458.0  |
| 82.5°  | 338.6  | 338.6  | 333.9  | 313.8  | 313.8  |
| 85°    | 203.9  | 199.2  | 194.4  | 179.1  | 174.3  |
| 87.5°  | 89.8   | 79.7   | 69.8   | 54.9   | 49.7   |
| 90°    | 3.2    | 38.0   | 103.6  | 97.3   | 100.5  |
| 92.5°  | 65.5   | 88.8   | 92.0   | 95.2   | 95.2   |
| 95°    | 154.4  | 184.0  | 189.3  | 189.3  | 184.0  |
| 97.5°  | 257.0  | 284.5  | 296.1  | 296.1  | 296.1  |
| 100°   | 375.4  | 399.7  | 408.1  | 408.1  | 405.0  |
| 102.5° | 500.2  | 518.1  | 529.8  | 532.9  | 529.8  |
| 105°   | 636.6  | 645.0  | 651.3  | 656.6  | 656.6  |
| 107.5° | 771.9  | 784.6  | 784.6  | 786.7  | 771.9  |
| 110°   | 903.1  | 919.9  | 919.9  | 919.9  | 911.5  |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 1044.7 | 1062.6 | 1059.5 | 1051.0 | 1044.7 |
| 115°   | 1184.3 | 1201.2 | 1195.9 | 1192.7 | 1184.3 |
| 117.5° | 1322.8 | 1346.1 | 1331.2 | 1322.8 | 1314.3 |
| 120°   | 1462.3 | 1485.6 | 1462.3 | 1462.3 | 1452.9 |
| 122.5° | 1589.2 | 1618.8 | 1604.1 | 1595.6 | 1589.2 |
| 125°   | 1722.5 | 1748.9 | 1740.5 | 1730.9 | 1727.8 |
| 127.5° | 1852.6 | 1885.3 | 1873.7 | 1861.0 | 1852.6 |
| 130°   | 1974.1 | 2012.2 | 2007.0 | 2000.5 | 1989.0 |
| 132.5° | 2110.5 | 2140.1 | 2142.3 | 2127.5 | 2119.0 |
| 135°   | 2227.9 | 2260.7 | 2267.0 | 2263.9 | 2255.4 |
| 137.5° | 2359.1 | 2385.5 | 2390.8 | 2388.7 | 2375.9 |
| 140°   | 2474.3 | 2500.7 | 2515.5 | 2515.5 | 2503.9 |
| 142.5° | 2592.7 | 2619.1 | 2627.6 | 2630.8 | 2619.1 |
| 145°   | 2704.7 | 2725.9 | 2742.9 | 2746.0 | 2734.4 |
| 147.5° | 2805.2 | 2831.7 | 2844.4 | 2849.7 | 2838.0 |
| 150°   | 2908.9 | 2926.9 | 2938.5 | 2947.9 | 2938.5 |
| 152.5° | 3000.8 | 3018.8 | 3033.7 | 3045.3 | 3033.7 |
| 155°   | 3092.9 | 3101.3 | 3110.9 | 3125.6 | 3116.1 |
| 157.5° | 3172.2 | 3178.5 | 3183.8 | 3204.9 | 3190.1 |
| 160°   | 3243.0 | 3249.4 | 3252.5 | 3270.4 | 3257.8 |
| 162.5° | 3308.6 | 3308.6 | 3311.7 | 3331.8 | 3317.0 |
| 165°   | 3364.6 | 3361.4 | 3361.4 | 3382.6 | 3367.8 |
| 167.5° | 3415.4 | 3405.8 | 3405.8 | 3427.0 | 3412.2 |
| 170°   | 3453.4 | 3445.0 | 3441.8 | 3463.0 | 3445.0 |
| 172.5° | 3479.8 | 3471.4 | 3468.2 | 3489.4 | 3471.4 |
| 175°   | 3501.0 | 3492.6 | 3486.3 | 3507.3 | 3489.4 |
| 177.5° | 3512.6 | 3504.2 | 3497.8 | 3515.8 | 3497.8 |
| 180°   | 3507.3 | 3507.3 | 3507.3 | 3507.3 | 3507.3 |

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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 | 14.08            | 15.01 | 14.97 | 15.92 | 17.08 | 13.63          | 14.56 | 14.52 | 15.47 | 16.64 |
|                 | 3H   | 15.74            | 16.57 | 16.64 | 17.49 | 18.68 | 15.25          | 16.08 | 16.15 | 17.00 | 18.19 |
|                 | 4H   | 16.32            | 17.11 | 17.24 | 18.04 | 19.24 | 15.83          | 16.62 | 16.75 | 17.55 | 18.74 |
|                 | 6H   | 16.72            | 17.45 | 17.65 | 18.39 | 19.60 | 16.22          | 16.95 | 17.15 | 17.89 | 19.10 |
|                 | 8H   | 16.83            | 17.52 | 17.77 | 18.47 | 19.68 | 16.33          | 17.02 | 17.27 | 17.97 | 19.18 |
|                 | 12H  | 16.88            | 17.54 | 17.82 | 18.48 | 19.72 | 16.37          | 17.03 | 17.31 | 17.97 | 19.21 |
| 4H              | 2H   | 14.54            | 15.33 | 15.46 | 16.26 | 17.45 | 14.19          | 14.98 | 15.11 | 15.90 | 17.10 |
|                 | 3H   | 16.41            | 17.07 | 17.34 | 18.02 | 19.24 | 16.00          | 16.66 | 16.93 | 17.62 | 18.83 |
|                 | 4H   | 17.12            | 17.72 | 18.07 | 18.68 | 19.91 | 16.70          | 17.30 | 17.64 | 18.25 | 19.49 |
|                 | 6H   | 17.64            | 18.16 | 18.59 | 19.13 | 20.37 | 17.20          | 17.72 | 18.16 | 18.70 | 19.94 |
|                 | 8H   | 17.78            | 18.27 | 18.74 | 19.24 | 20.49 | 17.35          | 17.83 | 18.31 | 18.80 | 20.05 |
|                 | 12H  | 17.86            | 18.30 | 18.84 | 19.28 | 20.54 | 17.41          | 17.85 | 18.39 | 18.83 | 20.09 |
| 8H              | 4H   | 17.32            | 17.81 | 18.28 | 18.77 | 20.02 | 16.94          | 17.43 | 17.90 | 18.40 | 19.65 |
|                 | 6H   | 17.95            | 18.35 | 18.93 | 19.36 | 20.61 | 17.56          | 17.97 | 18.55 | 18.98 | 20.23 |
|                 | 8H   | 18.17            | 18.52 | 19.16 | 19.52 | 20.79 | 17.77          | 18.13 | 18.77 | 19.13 | 20.39 |
|                 | 12H  | 18.30            | 18.61 | 19.29 | 19.60 | 20.92 | 17.89          | 18.20 | 18.88 | 19.19 | 20.51 |
| 12H             | 4H   | 17.31            | 17.75 | 18.29 | 18.73 | 19.99 | 16.94          | 17.38 | 17.92 | 18.36 | 19.62 |
|                 | 6H   | 17.98            | 18.33 | 18.97 | 19.33 | 20.60 | 17.60          | 17.96 | 18.60 | 18.96 | 20.23 |
|                 | 8H   | 18.22            | 18.53 | 19.22 | 19.52 | 20.84 | 17.84          | 18.15 | 18.84 | 19.14 | 20.46 |