

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: P913039

Luminaire Tested: DFN2DIP-TR4F0-120D100US850-FLLONL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P913039  
REPORT IS A COMBINATION OF REPORTS P902013 AND P898849  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-TR4F0-120D100US850-FLLONL  
Description: 4 foot, Triangle Define Geo, with Direct Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

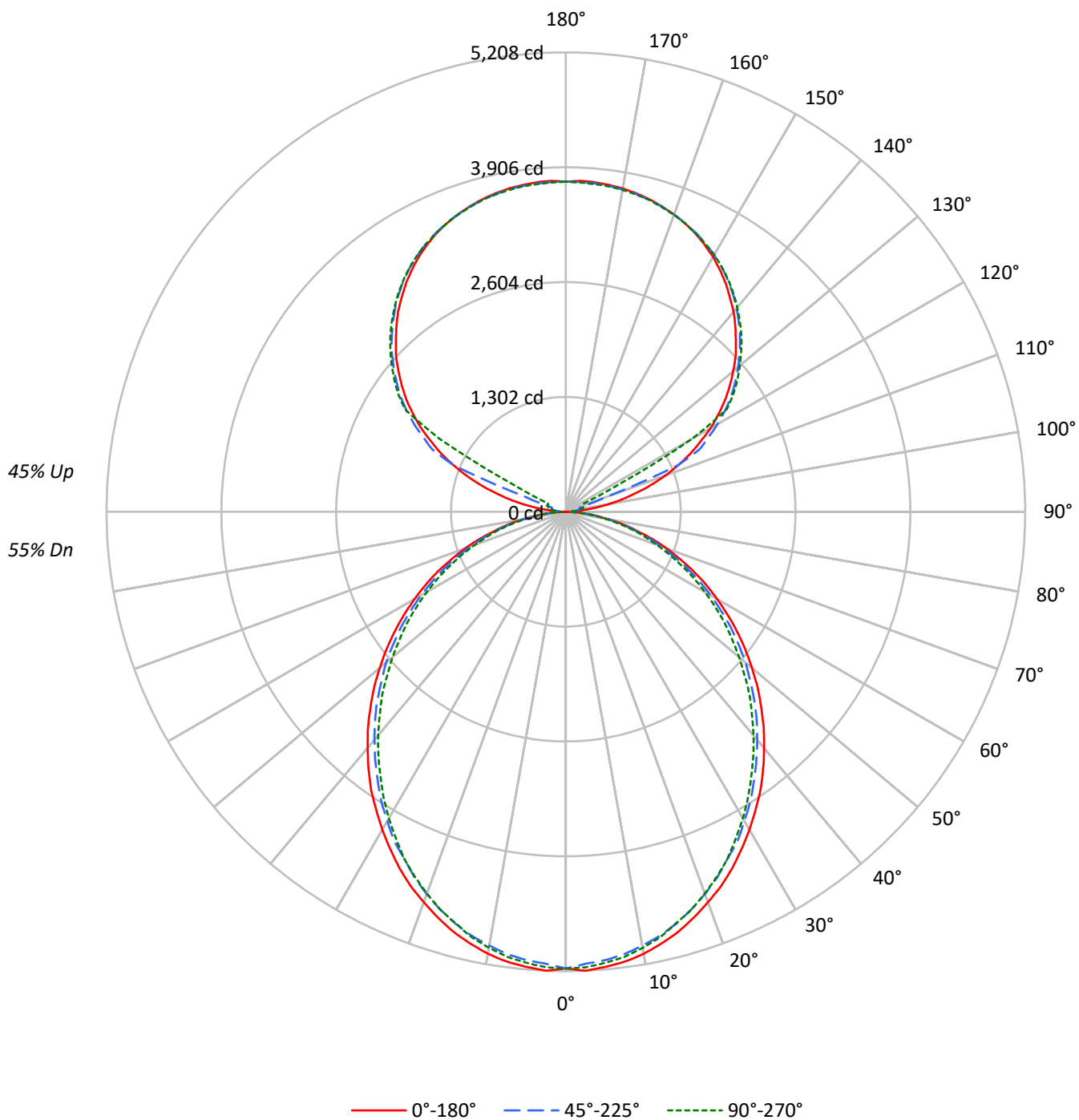
Lumens per Lamp: N/A  
Luminaire Lumens: 24154.0 lumens  
Efficiency: N/A  
Efficacy: 119.6 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 3.43' x L: 3.96' x H: 0.1')  
CIE Type: General Diffuse

Input Watts (W): 202  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9821  
Total Harmonic Distortion (THDi): 0.08  
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: P913039

CATALOG NUMBER: DFN2DIP-TR4F0-120D100US850-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   | 108 | 108 | 108 | 108 | 100 | 100 | 100 | 100 | 86 | 86 | 86 | 73 | 73 | 73 | 60 | 60 | 60 |
| 1   | 99  | 94  | 91  | 87  | 92  | 88  | 84  | 81  | 75 | 73 | 71 | 64 | 62 | 60 | 53 | 52 | 51 |
| 2   | 90  | 82  | 76  | 71  | 83  | 77  | 71  | 67  | 66 | 62 | 58 | 56 | 53 | 51 | 47 | 45 | 43 |
| 3   | 82  | 73  | 65  | 59  | 76  | 68  | 61  | 56  | 58 | 53 | 49 | 50 | 46 | 43 | 42 | 39 | 37 |
| 4   | 75  | 64  | 56  | 50  | 69  | 60  | 53  | 47  | 52 | 46 | 42 | 44 | 40 | 37 | 37 | 34 | 32 |
| 5   | 69  | 57  | 49  | 43  | 64  | 53  | 46  | 41  | 46 | 41 | 36 | 40 | 35 | 32 | 34 | 30 | 27 |
| 6   | 64  | 51  | 43  | 37  | 59  | 48  | 41  | 35  | 42 | 36 | 32 | 36 | 31 | 28 | 30 | 27 | 24 |
| 7   | 59  | 46  | 38  | 33  | 54  | 43  | 36  | 31  | 38 | 32 | 28 | 33 | 28 | 25 | 28 | 24 | 22 |
| 8   | 55  | 42  | 34  | 29  | 51  | 40  | 33  | 28  | 35 | 29 | 25 | 30 | 25 | 22 | 26 | 22 | 19 |
| 9   | 51  | 39  | 31  | 26  | 47  | 36  | 29  | 25  | 32 | 26 | 22 | 28 | 23 | 20 | 24 | 20 | 17 |
| 10  | 48  | 35  | 28  | 23  | 44  | 33  | 27  | 22  | 29 | 24 | 20 | 25 | 21 | 18 | 22 | 18 | 16 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 4114 | 4114 | 4114 |
| 5°  | 4120 | 4056 | 4084 |
| 10° | 4087 | 4002 | 4028 |
| 15° | 4027 | 3936 | 3942 |
| 20° | 3946 | 3844 | 3853 |
| 25° | 3865 | 3735 | 3751 |
| 30° | 3764 | 3633 | 3621 |
| 35° | 3668 | 3513 | 3483 |
| 40° | 3550 | 3391 | 3352 |
| 45° | 3432 | 3269 | 3218 |
| 50° | 3303 | 3142 | 3063 |
| 55° | 3169 | 2994 | 2920 |
| 60° | 3016 | 2819 | 2756 |
| 65° | 2850 | 2637 | 2564 |
| 70° | 2639 | 2416 | 2356 |
| 75° | 2346 | 2151 | 2164 |
| 80° | 1993 | 1813 | 1798 |
| 85° | 1442 | 1230 | 1191 |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 3432 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 487.4   | 2.0       |
| 10°-20°   | 1371.3  | 5.7       |
| 20°-30°   | 2015.2  | 8.3       |
| 30°-40°   | 2340.6  | 9.7       |
| 40°-50°   | 2337.7  | 9.7       |
| 50°-60°   | 2038.4  | 8.4       |
| 60°-70°   | 1506.8  | 6.2       |
| 70°-80°   | 852.5   | 3.5       |
| 80°-90°   | 231.6   | 1.0       |
| 90°-100°  | 123.4   | 0.5       |
| 100°-110° | 460.1   | 1.9       |
| 110°-120° | 1220.2  | 5.1       |
| 120°-130° | 2023.8  | 8.4       |
| 130°-140° | 2149.7  | 8.9       |
| 140°-150° | 1997.9  | 8.3       |
| 150°-160° | 1606.3  | 6.7       |
| 160°-170° | 1035.0  | 4.3       |
| 170°-180° | 356.2   | 1.5       |
| 0°-30°    | 3873.9  | 16.0      |
| 0°-40°    | 6214.5  | 25.7      |
| 0°-60°    | 10590.5 | 43.8      |
| 0°-90°    | 13181.5 | 54.6      |
| 90°-120°  | 1803.7  | 7.5       |
| 90°-150°  | 7975.0  | 33.0      |
| 90°-180°  | 10973.0 | 45.4      |
| 0°-180°   | 24154.0 | 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    | 32    | 54   | 68    | 73   | 22   |
| 95°  | 176  | 86    | 106  | 119   | 116  | 208  |
| 105° | 823  | 905   | 165  | 195   | 206  | 880  |
| 115° | 1557 | 1603  | 1671 | 417   | 222  | 1533 |
| 125° | 2202 | 2237  | 2288 | 2308  | 2316 | 1964 |
| 135° | 2725 | 2768  | 2792 | 2819  | 2814 | 2105 |
| 145° | 3161 | 3158  | 3204 | 3223  | 3209 | 1977 |
| 155° | 3480 | 3456  | 3488 | 3504  | 3483 | 1604 |
| 165° | 3667 | 3651  | 3659 | 3678  | 3659 | 1036 |
| 175° | 3751 | 3732  | 3737 | 3756  | 3729 | 357  |
| 180° | 3743 | 3743  | 3743 | 3743  | 3743 |      |

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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°    | 2.6    | 32.5   | 54.0   | 67.9   | 73.0   |
| 92.5°  | 67.9   | 56.9   | 65.0   | 70.4   | 73.0   |
| 95°    | 175.9  | 86.5   | 105.5  | 119.3  | 116.4  |
| 97.5°  | 316.7  | 94.8   | 138.0  | 146.3  | 148.9  |
| 100°   | 479.5  | 108.3  | 154.4  | 175.9  | 181.4  |
| 102.5° | 658.0  | 652.9  | 159.8  | 189.4  | 197.7  |
| 105°   | 823.3  | 904.6  | 165.4  | 194.9  | 205.8  |
| 107.5° | 1015.6 | 1083.2 | 170.8  | 200.4  | 211.3  |
| 110°   | 1199.8 | 1256.5 | 474.0  | 203.3  | 213.8  |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 1373.2 | 1421.7 | 1375.8 | 208.4  | 216.8  |
| 115°   | 1557.1 | 1603.2 | 1671.0 | 417.1  | 222.2  |
| 117.5° | 1717.0 | 1771.1 | 1817.3 | 1429.8 | 720.4  |
| 120°   | 1895.8 | 1936.3 | 1985.2 | 2017.7 | 1652.1 |
| 122.5° | 2047.3 | 2090.7 | 2145.0 | 2161.1 | 2164.0 |
| 125°   | 2201.7 | 2237.1 | 2288.5 | 2307.5 | 2315.5 |
| 127.5° | 2342.5 | 2380.5 | 2421.3 | 2448.3 | 2450.9 |
| 130°   | 2475.3 | 2518.8 | 2548.4 | 2578.2 | 2575.7 |
| 132.5° | 2610.7 | 2646.1 | 2675.7 | 2700.1 | 2697.5 |
| 135°   | 2724.6 | 2768.0 | 2792.1 | 2819.4 | 2814.0 |
| 137.5° | 2843.6 | 2876.1 | 2903.4 | 2930.4 | 2922.3 |
| 140°   | 2959.9 | 2981.9 | 3011.4 | 3035.9 | 3022.4 |
| 142.5° | 3057.7 | 3076.7 | 3111.7 | 3133.3 | 3119.8 |
| 145°   | 3160.6 | 3157.8 | 3203.8 | 3222.8 | 3209.2 |
| 147.5° | 3249.7 | 3241.7 | 3287.6 | 3301.2 | 3290.6 |
| 150°   | 3336.5 | 3317.6 | 3361.0 | 3377.1 | 3363.6 |
| 152.5° | 3409.5 | 3388.0 | 3428.6 | 3444.9 | 3425.9 |
| 155°   | 3480.0 | 3455.9 | 3488.4 | 3504.4 | 3482.9 |
| 157.5° | 3536.9 | 3515.4 | 3539.8 | 3558.8 | 3536.9 |
| 160°   | 3585.8 | 3569.4 | 3585.8 | 3601.9 | 3583.0 |
| 162.5° | 3628.9 | 3612.8 | 3626.3 | 3645.3 | 3620.9 |
| 165°   | 3666.8 | 3650.7 | 3658.8 | 3677.8 | 3658.8 |
| 167.5° | 3696.7 | 3680.3 | 3688.8 | 3707.7 | 3683.2 |
| 170°   | 3721.1 | 3704.8 | 3710.3 | 3729.2 | 3704.8 |
| 172.5° | 3737.2 | 3721.1 | 3726.7 | 3745.6 | 3721.1 |
| 175°   | 3750.7 | 3731.8 | 3737.2 | 3756.3 | 3729.2 |
| 177.5° | 3756.3 | 3737.2 | 3740.2 | 3759.2 | 3734.7 |
| 180°   | 3742.8 | 3742.8 | 3742.8 | 3742.8 | 3742.8 |

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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 | 12.59            | 13.50 | 13.51 | 14.43 | 15.64 | 12.16          | 13.07 | 13.08 | 14.00 | 15.21 |
|                 | 3H   | 14.26            | 15.07 | 15.18 | 16.01 | 17.24 | 13.78          | 14.59 | 14.71 | 15.54 | 16.77 |
|                 | 4H   | 14.85            | 15.61 | 15.79 | 16.56 | 17.80 | 14.37          | 15.14 | 15.32 | 16.09 | 17.33 |
|                 | 6H   | 15.25            | 15.95 | 16.20 | 16.91 | 18.16 | 14.77          | 15.48 | 15.73 | 16.43 | 17.69 |
|                 | 8H   | 15.35            | 16.03 | 16.31 | 17.00 | 18.25 | 14.88          | 15.55 | 15.84 | 16.53 | 17.77 |
|                 | 12H  | 15.40            | 16.04 | 16.37 | 17.01 | 18.28 | 14.92          | 15.56 | 15.89 | 16.53 | 17.80 |
| 4H              | 2H   | 13.06            | 13.83 | 14.01 | 14.78 | 16.01 | 12.72          | 13.48 | 13.66 | 14.43 | 15.67 |
|                 | 3H   | 14.93            | 15.57 | 15.89 | 16.55 | 17.80 | 14.54          | 15.18 | 15.50 | 16.16 | 17.41 |
|                 | 4H   | 15.65            | 16.23 | 16.61 | 17.20 | 18.48 | 15.24          | 15.83 | 16.21 | 16.80 | 18.08 |
|                 | 6H   | 16.16            | 16.67 | 17.14 | 17.66 | 18.94 | 15.75          | 16.26 | 16.73 | 17.26 | 18.53 |
|                 | 8H   | 16.31            | 16.78 | 17.30 | 17.78 | 19.06 | 15.90          | 16.37 | 16.88 | 17.36 | 18.65 |
|                 | 12H  | 16.39            | 16.81 | 17.39 | 17.82 | 19.12 | 15.97          | 16.39 | 16.97 | 17.40 | 18.69 |
| 8H              | 4H   | 15.85            | 16.32 | 16.83 | 17.31 | 18.60 | 15.49          | 15.96 | 16.47 | 16.95 | 18.24 |
|                 | 6H   | 16.48            | 16.87 | 17.49 | 17.90 | 19.19 | 16.12          | 16.51 | 17.12 | 17.54 | 18.83 |
|                 | 8H   | 16.70            | 17.04 | 17.72 | 18.06 | 19.37 | 16.33          | 16.68 | 17.35 | 17.69 | 19.00 |
|                 | 12H  | 16.83            | 17.14 | 17.85 | 18.15 | 19.50 | 16.45          | 16.75 | 17.47 | 17.77 | 19.12 |
| 12H             | 4H   | 15.83            | 16.26 | 16.84 | 17.27 | 18.56 | 15.48          | 15.91 | 16.48 | 16.91 | 18.21 |
|                 | 6H   | 16.51            | 16.85 | 17.53 | 17.87 | 19.18 | 16.16          | 16.50 | 17.17 | 17.52 | 18.83 |
|                 | 8H   | 16.75            | 17.06 | 17.77 | 18.07 | 19.42 | 16.40          | 16.70 | 17.42 | 17.71 | 19.06 |