

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: P912403

Luminaire Tested: DFN2DIP-SQ4F0-140D140US850-RLLONL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P912403  
REPORT IS A COMBINATION OF REPORTS P901720 AND P898471  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-SQ4F0-140D140US850-RLLONL  
Description: 4 foot, Square Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

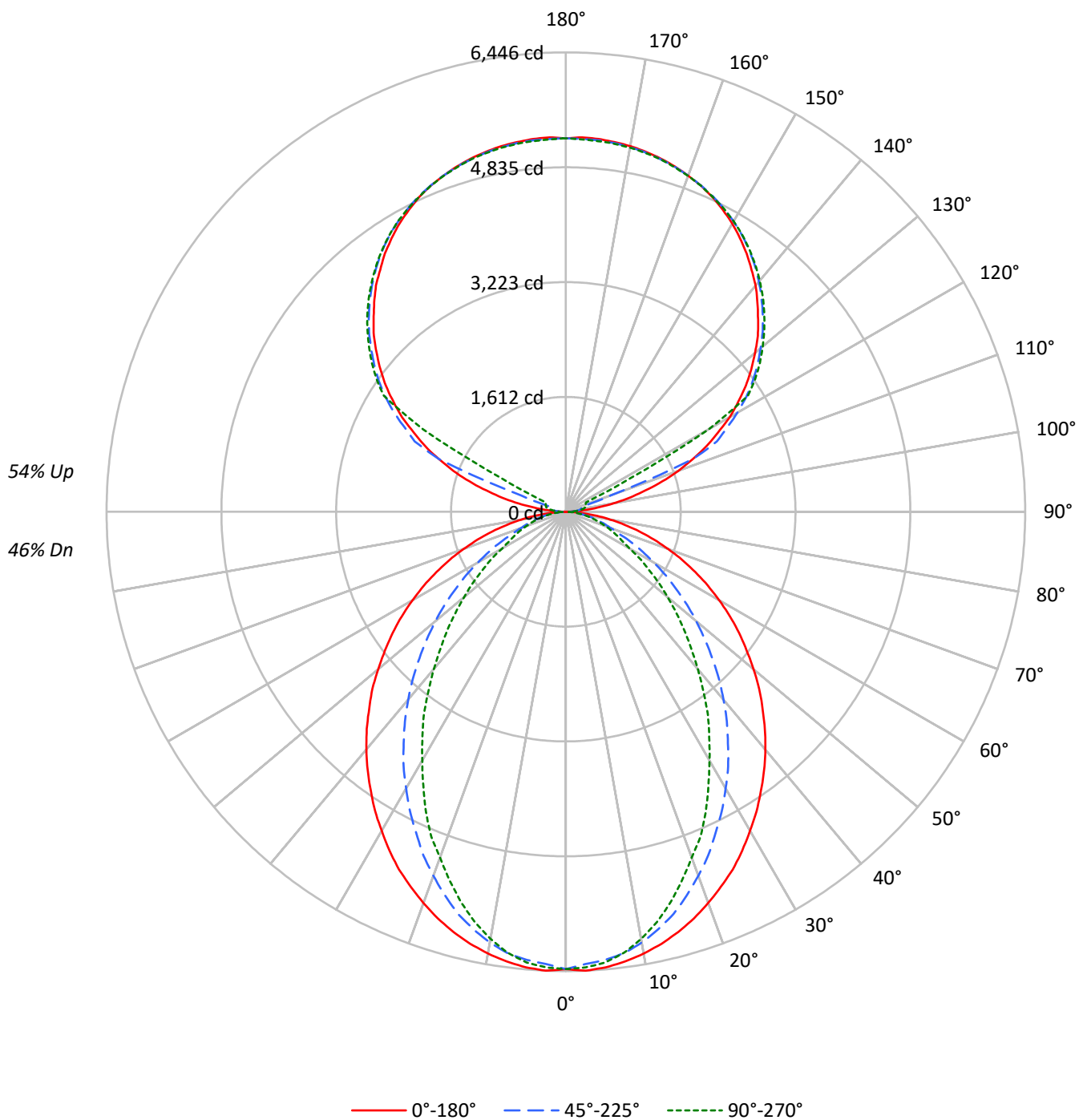
Lumens per Lamp: N/A  
Luminaire Lumens: 28567.8 lumens  
Efficiency: N/A  
Efficacy: 114.5 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 0.99 / 1.16  
Luminous Opening: Rectangular w/ Sides (W: 3.92' x L: 3.92' x H: 0.1')  
CIE Type: General Diffuse

Input Watts (W): 249.6  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9789  
Total Harmonic Distortion (THDi): 0.074  
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



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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 | 50 | 30 | 10 |
| RCR |     |     |     |     |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 0   | 106 | 106 | 106 | 106 | 98 | 98 | 98 | 98 | 81 | 81 | 81 | 66 | 66 | 66 | 53 | 53 | 53 |    |    | 46 |
| 1   | 97  | 93  | 90  | 86  | 89 | 86 | 83 | 80 | 72 | 70 | 68 | 59 | 58 | 56 | 47 | 46 | 45 |    |    | 40 |
| 2   | 89  | 82  | 76  | 71  | 82 | 76 | 70 | 66 | 63 | 60 | 57 | 52 | 50 | 48 | 42 | 40 | 39 |    |    | 34 |
| 3   | 81  | 72  | 65  | 60  | 75 | 67 | 61 | 56 | 56 | 52 | 48 | 47 | 43 | 41 | 38 | 35 | 34 |    |    | 29 |
| 4   | 75  | 64  | 57  | 51  | 68 | 60 | 53 | 48 | 50 | 45 | 41 | 42 | 38 | 35 | 34 | 31 | 29 |    |    | 26 |
| 5   | 69  | 58  | 50  | 44  | 63 | 53 | 46 | 41 | 45 | 40 | 36 | 38 | 34 | 31 | 31 | 28 | 26 |    |    | 23 |
| 6   | 63  | 52  | 44  | 38  | 58 | 48 | 41 | 36 | 41 | 36 | 32 | 34 | 30 | 27 | 28 | 25 | 23 |    |    | 20 |
| 7   | 59  | 47  | 39  | 34  | 54 | 44 | 37 | 32 | 37 | 32 | 28 | 31 | 27 | 24 | 26 | 23 | 21 |    |    | 18 |
| 8   | 55  | 43  | 35  | 30  | 50 | 40 | 33 | 28 | 34 | 29 | 25 | 29 | 25 | 22 | 24 | 21 | 19 |    |    | 16 |
| 9   | 51  | 39  | 32  | 27  | 47 | 36 | 30 | 25 | 31 | 26 | 22 | 27 | 23 | 20 | 22 | 19 | 17 |    |    | 15 |
| 10  | 48  | 36  | 29  | 24  | 44 | 33 | 27 | 23 | 29 | 24 | 20 | 25 | 21 | 18 | 20 | 18 | 15 |    |    | 13 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 4503 | 4503 | 4503 |
| 5°  | 4510 | 4432 | 4461 |
| 10° | 4465 | 4346 | 4317 |
| 15° | 4403 | 4203 | 4094 |
| 20° | 4322 | 4006 | 3819 |
| 25° | 4239 | 3785 | 3554 |
| 30° | 4127 | 3558 | 3218 |
| 35° | 4017 | 3314 | 2922 |
| 40° | 3906 | 3061 | 2583 |
| 45° | 3776 | 2781 | 2276 |
| 50° | 3642 | 2498 | 1975 |
| 55° | 3502 | 2195 | 1686 |
| 60° | 3340 | 1879 | 1389 |
| 65° | 3154 | 1557 | 1252 |
| 70° | 2928 | 1257 | 1135 |
| 75° | 2644 | 1110 | 1035 |
| 80° | 2234 | 934  | 903  |
| 85° | 1555 | 628  | 687  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 3776 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 601.4   | 2.1       |
| 10°-20°   | 1651.0  | 5.8       |
| 20°-30°   | 2317.9  | 8.1       |
| 30°-40°   | 2526.6  | 8.8       |
| 40°-50°   | 2322.3  | 8.1       |
| 50°-60°   | 1823.8  | 6.4       |
| 60°-70°   | 1187.1  | 4.2       |
| 70°-80°   | 611.1   | 2.1       |
| 80°-90°   | 165.2   | 0.6       |
| 90°-100°  | 172.8   | 0.6       |
| 100°-110° | 644.1   | 2.3       |
| 110°-120° | 1708.2  | 6.0       |
| 120°-130° | 2833.3  | 9.9       |
| 130°-140° | 3009.6  | 10.5      |
| 140°-150° | 2797.1  | 9.8       |
| 150°-160° | 2248.8  | 7.9       |
| 160°-170° | 1449.0  | 5.1       |
| 170°-180° | 498.7   | 1.7       |
| 0°-30°    | 4570.2  | 16.0      |
| 0°-40°    | 7096.9  | 24.8      |
| 0°-60°    | 11242.9 | 39.4      |
| 0°-90°    | 13206.3 | 46.2      |
| 90°-120°  | 2525.1  | 8.8       |
| 90°-150°  | 11165.0 | 39.1      |
| 90°-180°  | 15362.0 | 53.8      |
| 0°-180°   | 28567.8 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 6417 | 6417  | 6417 | 6417  | 6417 |      |
| 5°   | 6417 | 6388  | 6312 | 6365  | 6347 | 608  |
| 15°  | 6103 | 6039  | 5842 | 5732  | 5674 | 1720 |
| 25°  | 5540 | 5354  | 4971 | 4733  | 4646 | 2548 |
| 35°  | 4774 | 4477  | 3967 | 3601  | 3472 | 2988 |
| 45°  | 3902 | 3513  | 2904 | 2491  | 2352 | 3014 |
| 55°  | 2967 | 2514  | 1887 | 1539  | 1429 | 2651 |
| 65°  | 2004 | 1533  | 1010 | 813   | 795  | 1986 |
| 75°  | 1068 | 662   | 465  | 424   | 418  | 1130 |
| 85°  | 250  | 128   | 110  | 110   | 110  | 286  |
| 90°  | 4    | 46    | 76   | 95    | 102  | 27   |
| 95°  | 246  | 121   | 148  | 167   | 163  | 292  |
| 105° | 1153 | 1266  | 231  | 273   | 288  | 1231 |
| 115° | 2180 | 2244  | 2339 | 584   | 311  | 2146 |
| 125° | 3082 | 3132  | 3204 | 3230  | 3242 | 2749 |
| 135° | 3814 | 3875  | 3909 | 3947  | 3940 | 2947 |
| 145° | 4425 | 4421  | 4485 | 4512  | 4493 | 2767 |
| 155° | 4872 | 4838  | 4884 | 4906  | 4876 | 2245 |
| 165° | 5134 | 5111  | 5122 | 5149  | 5122 | 1450 |
| 175° | 5251 | 5224  | 5232 | 5259  | 5221 | 500  |
| 180° | 5240 | 5240  | 5240 | 5240  | 5240 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 6416.9 | 6416.9 | 6416.9 | 6416.9 | 6416.9 |
| 2.5°   | 6445.8 | 6416.9 | 6352.8 | 6411.4 | 6399.6 |
| 5°     | 6416.9 | 6388.0 | 6312.1 | 6364.6 | 6347.3 |
| 7.5°   | 6364.6 | 6330.0 | 6248.7 | 6271.5 | 6242.6 |
| 10°    | 6294.9 | 6254.2 | 6138.4 | 6120.5 | 6086.0 |
| 12.5°  | 6208.0 | 6155.6 | 5998.5 | 5964.0 | 5900.0 |
| 15°    | 6103.3 | 6039.2 | 5842.0 | 5731.8 | 5673.9 |
| 17.5°  | 5981.3 | 5888.2 | 5644.3 | 5516.7 | 5423.7 |
| 20°    | 5842.0 | 5725.5 | 5435.4 | 5290.6 | 5162.5 |
| 22.5°  | 5691.1 | 5557.4 | 5220.4 | 5023.2 | 4936.4 |
| 25°    | 5540.1 | 5354.0 | 4970.9 | 4733.0 | 4645.5 |
| 27.5°  | 5360.2 | 5162.5 | 4738.5 | 4465.6 | 4332.0 |
| 30°    | 5168.6 | 4947.5 | 4482.9 | 4187.1 | 4030.0 |
| 32.5°  | 4982.5 | 4715.1 | 4239.5 | 3890.8 | 3745.4 |
| 35°    | 4773.7 | 4477.4 | 3966.6 | 3600.6 | 3472.4 |
| 37.5°  | 4570.4 | 4250.6 | 3710.8 | 3309.8 | 3165.0 |
| 40°    | 4355.4 | 4007.3 | 3443.4 | 3031.3 | 2880.4 |
| 42.5°  | 4134.8 | 3763.3 | 3176.7 | 2746.7 | 2601.8 |
| 45°    | 3902.5 | 3513.1 | 2903.8 | 2490.9 | 2351.7 |
| 47.5°  | 3681.9 | 3269.8 | 2642.5 | 2229.8 | 2102.2 |
| 50°    | 3437.9 | 3025.8 | 2386.8 | 1985.8 | 1864.3 |
| 52.5°  | 3199.5 | 2763.8 | 2142.8 | 1759.7 | 1649.3 |
| 55°    | 2967.2 | 2514.3 | 1887.2 | 1539.1 | 1428.7 |
| 57.5°  | 2729.4 | 2264.8 | 1661.1 | 1335.8 | 1242.7 |
| 60°    | 2485.4 | 2020.8 | 1422.6 | 1126.9 | 1033.8 |
| 62.5°  | 2247.6 | 1783.1 | 1219.3 | 940.8  | 894.6  |
| 65°    | 2003.6 | 1532.9 | 1010.4 | 813.2  | 795.4  |
| 67.5°  | 1771.3 | 1300.6 | 813.2  | 714.1  | 696.8  |
| 70°    | 1527.3 | 1074.5 | 673.4  | 615.5  | 592.1  |
| 72.5°  | 1295.1 | 865.0  | 563.2  | 516.9  | 505.3  |
| 75°    | 1068.3 | 661.7  | 464.6  | 423.9  | 418.3  |
| 77.5°  | 842.3  | 470.1  | 366.0  | 342.6  | 330.8  |
| 80°    | 632.8  | 337.0  | 278.5  | 255.7  | 255.7  |
| 82.5°  | 441.2  | 226.7  | 191.6  | 179.9  | 179.9  |
| 85°    | 249.5  | 127.5  | 110.2  | 110.2  | 110.2  |
| 87.5°  | 93.0   | 46.2   | 46.2   | 40.7   | 40.7   |
| 90°    | 3.5    | 45.5   | 75.6   | 95.0   | 102.2  |
| 92.5°  | 95.0   | 79.7   | 90.9   | 98.6   | 102.2  |
| 95°    | 246.3  | 121.1  | 147.7  | 167.0  | 163.0  |
| 97.5°  | 443.5  | 132.9  | 193.2  | 204.8  | 208.5  |
| 100°   | 671.3  | 151.7  | 216.1  | 246.3  | 254.0  |
| 102.5° | 921.1  | 913.9  | 223.8  | 265.2  | 276.9  |
| 105°   | 1152.6 | 1266.5 | 231.4  | 272.8  | 288.1  |
| 107.5° | 1421.8 | 1516.3 | 239.1  | 280.5  | 295.8  |
| 110°   | 1679.8 | 1759.1 | 663.6  | 284.6  | 299.4  |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 1922.5 | 1990.4 | 1926.1 | 291.8  | 303.4  |
| 115°   | 2180.1 | 2244.4 | 2339.4 | 584.0  | 311.1  |
| 117.5° | 2403.8 | 2479.4 | 2544.3 | 2001.7 | 1008.5 |
| 120°   | 2654.2 | 2710.8 | 2779.3 | 2824.7 | 2312.8 |
| 122.5° | 2866.2 | 2927.0 | 3003.1 | 3025.6 | 3029.7 |
| 125°   | 3082.4 | 3131.8 | 3203.9 | 3230.4 | 3241.7 |
| 127.5° | 3279.5 | 3332.7 | 3389.8 | 3427.6 | 3431.2 |
| 130°   | 3465.4 | 3526.3 | 3567.7 | 3609.6 | 3605.9 |
| 132.5° | 3655.0 | 3704.5 | 3746.0 | 3780.1 | 3776.6 |
| 135°   | 3814.4 | 3875.2 | 3908.9 | 3947.2 | 3939.5 |
| 137.5° | 3981.0 | 4026.4 | 4064.7 | 4102.5 | 4091.3 |
| 140°   | 4144.0 | 4174.6 | 4216.0 | 4250.2 | 4231.3 |
| 142.5° | 4280.9 | 4307.4 | 4356.5 | 4386.6 | 4367.7 |
| 145°   | 4424.9 | 4420.8 | 4485.2 | 4511.9 | 4492.9 |
| 147.5° | 4549.7 | 4538.4 | 4602.8 | 4621.6 | 4606.8 |
| 150°   | 4671.2 | 4644.6 | 4705.4 | 4727.9 | 4709.0 |
| 152.5° | 4773.4 | 4743.2 | 4800.0 | 4822.9 | 4796.3 |
| 155°   | 4871.9 | 4838.2 | 4883.7 | 4906.2 | 4876.1 |
| 157.5° | 4951.7 | 4921.5 | 4955.8 | 4982.3 | 4951.7 |
| 160°   | 5020.1 | 4997.2 | 5020.1 | 5042.6 | 5016.1 |
| 162.5° | 5080.4 | 5057.9 | 5076.9 | 5103.4 | 5069.2 |
| 165°   | 5133.6 | 5111.0 | 5122.4 | 5148.9 | 5122.4 |
| 167.5° | 5175.5 | 5152.5 | 5164.2 | 5190.8 | 5156.5 |
| 170°   | 5209.6 | 5186.7 | 5194.3 | 5221.0 | 5186.7 |
| 172.5° | 5232.2 | 5209.6 | 5217.3 | 5243.9 | 5209.6 |
| 175°   | 5251.1 | 5224.5 | 5232.2 | 5258.8 | 5221.0 |
| 177.5° | 5258.8 | 5232.2 | 5236.3 | 5262.8 | 5228.6 |
| 180°   | 5239.8 | 5239.8 | 5239.8 | 5239.8 | 5239.8 |

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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 | 12.02            | 12.82 | 13.02 | 13.83 | 15.15 | 7.98           | 8.79  | 8.98  | 9.79  | 11.11 |
|                 | 3H   | 13.70            | 14.42 | 14.71 | 15.43 | 16.78 | 9.17           | 9.89  | 10.18 | 10.90 | 12.25 |
|                 | 4H   | 14.31            | 14.99 | 15.33 | 16.01 | 17.36 | 9.62           | 10.30 | 10.64 | 11.31 | 12.67 |
|                 | 6H   | 14.74            | 15.36 | 15.77 | 16.38 | 17.75 | 9.94           | 10.56 | 10.97 | 11.58 | 12.95 |
|                 | 8H   | 14.87            | 15.46 | 15.90 | 16.49 | 17.86 | 10.03          | 10.62 | 11.07 | 11.66 | 13.02 |
|                 | 12H  | 14.93            | 15.49 | 15.97 | 16.52 | 17.91 | 10.07          | 10.64 | 11.11 | 11.67 | 13.05 |
| 4H              | 2H   | 12.04            | 12.72 | 13.06 | 13.73 | 15.09 | 8.58           | 9.26  | 9.60  | 10.27 | 11.63 |
|                 | 3H   | 13.87            | 14.43 | 14.90 | 15.48 | 16.84 | 9.93           | 10.49 | 10.96 | 11.53 | 12.90 |
|                 | 4H   | 14.56            | 15.08 | 15.60 | 16.11 | 17.51 | 10.48          | 10.99 | 11.52 | 12.02 | 13.42 |
|                 | 6H   | 15.08            | 15.52 | 16.13 | 16.58 | 17.97 | 10.89          | 11.34 | 11.94 | 12.39 | 13.78 |
|                 | 8H   | 15.26            | 15.67 | 16.31 | 16.72 | 18.12 | 11.02          | 11.43 | 12.07 | 12.49 | 13.89 |
|                 | 12H  | 15.36            | 15.73 | 16.42 | 16.79 | 18.20 | 11.09          | 11.46 | 12.15 | 12.52 | 13.93 |
| 8H              | 4H   | 14.53            | 14.94 | 15.58 | 15.99 | 17.40 | 10.76          | 11.17 | 11.81 | 12.22 | 13.62 |
|                 | 6H   | 15.10            | 15.44 | 16.17 | 16.53 | 17.93 | 11.27          | 11.61 | 12.35 | 12.71 | 14.11 |
|                 | 8H   | 15.32            | 15.62 | 16.40 | 16.70 | 18.11 | 11.47          | 11.76 | 12.55 | 12.84 | 14.26 |
|                 | 12H  | 15.46            | 15.72 | 16.54 | 16.79 | 18.25 | 11.58          | 11.85 | 12.67 | 12.92 | 14.38 |
| 12H             | 4H   | 14.48            | 14.85 | 15.55 | 15.92 | 17.33 | 10.76          | 11.13 | 11.83 | 12.20 | 13.60 |
|                 | 6H   | 15.08            | 15.37 | 16.16 | 16.45 | 17.87 | 11.32          | 11.62 | 12.41 | 12.70 | 14.12 |
|                 | 8H   | 15.30            | 15.56 | 16.38 | 16.63 | 18.09 | 11.53          | 11.80 | 12.62 | 12.87 | 14.33 |