

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: P906085

Luminaire Tested: DFN2DIP-PN4F0-090D120US835-FLLONL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P906085  
REPORT IS A COMBINATION OF REPORTS P901283 AND P898053  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-PN4F0-090D120US835-FLLONL  
Description: 4 foot, Pentagon Define Geo, with Direct Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

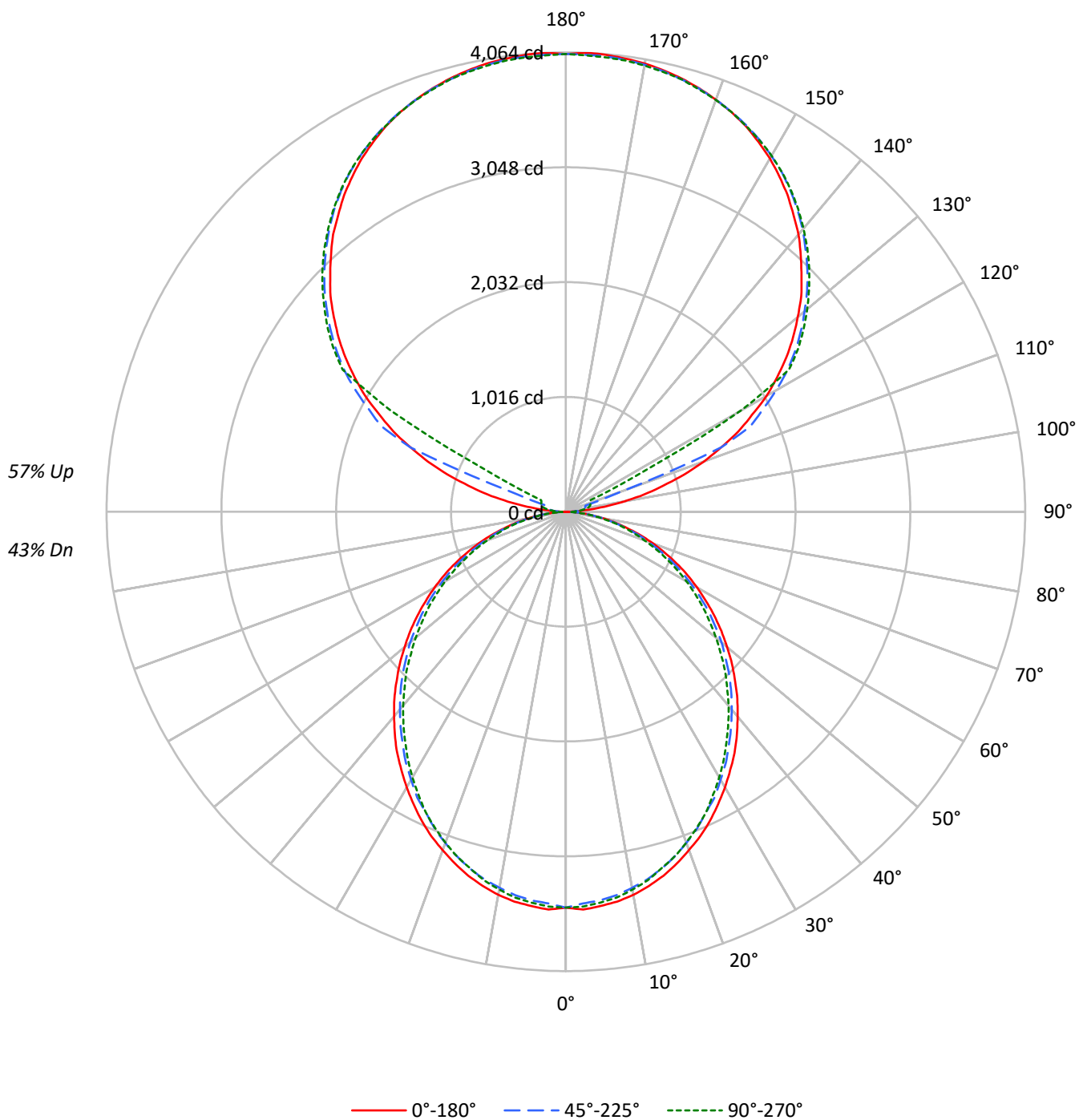
Lumens per Lamp: N/A  
Luminaire Lumens: 20790.0 lumens  
Efficiency: N/A  
Efficacy: 108.3 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 3.74' x L: 3.94' x H: 0.1')  
CIE Type: General Diffuse

Input Watts (W): 191.9  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9963  
Total Harmonic Distortion (THDi): 0.065  
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 |
| RCR |     |     |     |     |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 0   | 105 | 105 | 105 | 105 | 96 | 96 | 96 | 96 | 79 | 79 | 79 | 64 | 64 | 64 | 50 | 50 | 50 |
| 1   | 96  | 92  | 88  | 85  | 88 | 84 | 81 | 78 | 70 | 67 | 65 | 56 | 55 | 53 | 44 | 43 | 42 |
| 2   | 88  | 80  | 74  | 69  | 80 | 74 | 68 | 64 | 61 | 57 | 54 | 49 | 47 | 44 | 39 | 37 | 35 |
| 3   | 80  | 71  | 63  | 58  | 73 | 65 | 58 | 53 | 54 | 49 | 45 | 44 | 40 | 38 | 34 | 32 | 30 |
| 4   | 73  | 62  | 55  | 49  | 66 | 57 | 50 | 45 | 48 | 43 | 39 | 39 | 35 | 32 | 31 | 28 | 26 |
| 5   | 67  | 56  | 48  | 42  | 61 | 51 | 44 | 39 | 43 | 37 | 33 | 35 | 31 | 28 | 28 | 25 | 23 |
| 6   | 62  | 50  | 42  | 36  | 56 | 46 | 39 | 34 | 38 | 33 | 29 | 31 | 27 | 24 | 25 | 22 | 20 |
| 7   | 57  | 45  | 37  | 32  | 52 | 41 | 34 | 29 | 35 | 29 | 25 | 29 | 25 | 22 | 23 | 20 | 18 |
| 8   | 53  | 41  | 33  | 28  | 48 | 38 | 31 | 26 | 32 | 26 | 23 | 26 | 22 | 19 | 21 | 18 | 16 |
| 9   | 49  | 37  | 30  | 25  | 45 | 34 | 28 | 23 | 29 | 24 | 20 | 24 | 20 | 17 | 19 | 16 | 14 |
| 10  | 46  | 34  | 27  | 22  | 42 | 31 | 25 | 21 | 27 | 22 | 18 | 22 | 18 | 16 | 18 | 15 | 13 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 2556 | 2556 | 2556 |
| 5°  | 2560 | 2521 | 2538 |
| 10° | 2540 | 2487 | 2504 |
| 15° | 2502 | 2447 | 2451 |
| 20° | 2452 | 2390 | 2396 |
| 25° | 2402 | 2323 | 2333 |
| 30° | 2339 | 2260 | 2253 |
| 35° | 2279 | 2185 | 2168 |
| 40° | 2206 | 2110 | 2087 |
| 45° | 2132 | 2035 | 2005 |
| 50° | 2053 | 1956 | 1909 |
| 55° | 1969 | 1865 | 1821 |
| 60° | 1874 | 1756 | 1720 |
| 65° | 1771 | 1644 | 1601 |
| 70° | 1639 | 1507 | 1473 |
| 75° | 1457 | 1344 | 1356 |
| 80° | 1238 | 1135 | 1131 |
| 85° | 895  | 775  | 757  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 90°

Vertical Angle: 90°

Luminance: 2160 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 329.6   | 1.6       |
| 10°-20°   | 927.4   | 4.5       |
| 20°-30°   | 1362.9  | 6.6       |
| 30°-40°   | 1582.9  | 7.6       |
| 40°-50°   | 1580.9  | 7.6       |
| 50°-60°   | 1378.5  | 6.6       |
| 60°-70°   | 1019.0  | 4.9       |
| 70°-80°   | 576.6   | 2.8       |
| 80°-90°   | 159.3   | 0.8       |
| 90°-100°  | 133.5   | 0.6       |
| 100°-110° | 497.8   | 2.4       |
| 110°-120° | 1320.3  | 6.4       |
| 120°-130° | 2189.8  | 10.5      |
| 130°-140° | 2326.1  | 11.2      |
| 140°-150° | 2161.8  | 10.4      |
| 150°-160° | 1738.1  | 8.4       |
| 160°-170° | 1119.9  | 5.4       |
| 170°-180° | 385.5   | 1.9       |
| 0°-30°    | 2619.9  | 12.6      |
| 0°-40°    | 4202.8  | 20.2      |
| 0°-60°    | 7162.3  | 34.5      |
| 0°-90°    | 8917.1  | 42.9      |
| 90°-120°  | 1951.7  | 9.4       |
| 90°-150°  | 8629.4  | 41.5      |
| 90°-180°  | 11873.0 | 57.1      |
| 0°-180°   | 20790.0 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 3502 | 3502  | 3502 | 3502  | 3502 |      |
| 5°   | 3502 | 3489  | 3452 | 3478  | 3472 | 332  |
| 15°  | 3334 | 3314  | 3270 | 3283  | 3266 | 939  |
| 25°  | 3017 | 2990  | 2933 | 2940  | 2933 | 1388 |
| 35°  | 2603 | 2570  | 2516 | 2495  | 2478 | 1626 |
| 45°  | 2118 | 2095  | 2044 | 2007  | 1994 | 1635 |
| 55°  | 1603 | 1583  | 1542 | 1502  | 1485 | 1433 |
| 65°  | 1081 | 1061  | 1027 | 997   | 980  | 1069 |
| 75°  | 566  | 559   | 542  | 522   | 529  | 604  |
| 85°  | 138  | 135   | 132  | 121   | 118  | 154  |
| 90°  | 3    | 35    | 58   | 73    | 79   | 19   |
| 95°  | 190  | 94    | 114  | 129   | 126  | 225  |
| 105° | 891  | 979   | 179  | 211   | 223  | 952  |
| 115° | 1685 | 1735  | 1808 | 451   | 240  | 1659 |
| 125° | 2382 | 2421  | 2476 | 2497  | 2506 | 2125 |
| 135° | 2948 | 2995  | 3021 | 3051  | 3045 | 2277 |
| 145° | 3420 | 3417  | 3467 | 3487  | 3472 | 2139 |
| 155° | 3766 | 3739  | 3775 | 3792  | 3769 | 1735 |
| 165° | 3968 | 3950  | 3959 | 3980  | 3959 | 1121 |
| 175° | 4058 | 4038  | 4044 | 4064  | 4035 | 386  |
| 180° | 4050 | 4050  | 4050 | 4050  | 4050 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 3501.9 | 3501.9 | 3501.9 | 3501.9 | 3501.9 |
| 2.5°   | 3522.3 | 3505.5 | 3468.4 | 3501.9 | 3495.5 |
| 5°     | 3501.9 | 3488.7 | 3451.6 | 3478.4 | 3471.9 |
| 7.5°   | 3478.4 | 3458.4 | 3421.2 | 3448.4 | 3441.6 |
| 10°    | 3441.6 | 3418.0 | 3377.6 | 3404.4 | 3394.4 |
| 12.5°  | 3390.8 | 3370.8 | 3330.5 | 3347.2 | 3340.5 |
| 15°    | 3333.7 | 3313.7 | 3269.7 | 3283.3 | 3266.5 |
| 17.5°  | 3262.9 | 3242.9 | 3199.0 | 3215.8 | 3199.0 |
| 20°    | 3185.4 | 3165.4 | 3118.2 | 3128.2 | 3115.0 |
| 22.5°  | 3108.2 | 3077.9 | 3033.9 | 3033.9 | 3027.1 |
| 25°    | 3017.1 | 2990.3 | 2933.2 | 2939.6 | 2933.2 |
| 27.5°  | 2916.0 | 2892.4 | 2848.9 | 2838.9 | 2822.1 |
| 30°    | 2815.3 | 2788.1 | 2737.7 | 2727.7 | 2714.2 |
| 32.5°  | 2707.4 | 2687.4 | 2633.4 | 2613.1 | 2599.5 |
| 35°    | 2603.1 | 2569.5 | 2515.5 | 2495.2 | 2478.4 |
| 37.5°  | 2485.2 | 2454.8 | 2400.8 | 2377.3 | 2360.5 |
| 40°    | 2364.0 | 2336.9 | 2282.9 | 2252.9 | 2239.4 |
| 42.5°  | 2246.1 | 2219.0 | 2165.4 | 2131.5 | 2111.5 |
| 45°    | 2118.2 | 2094.7 | 2043.9 | 2007.1 | 1993.6 |
| 47.5°  | 1993.6 | 1970.0 | 1916.0 | 1878.9 | 1858.9 |
| 50°    | 1862.1 | 1845.3 | 1798.1 | 1751.0 | 1734.2 |
| 52.5°  | 1734.2 | 1710.6 | 1667.0 | 1629.9 | 1606.3 |
| 55°    | 1603.1 | 1582.7 | 1542.3 | 1502.0 | 1485.2 |
| 57.5°  | 1471.6 | 1454.8 | 1410.9 | 1370.5 | 1356.9 |
| 60°    | 1340.1 | 1326.9 | 1279.7 | 1242.6 | 1232.6 |
| 62.5°  | 1212.2 | 1188.6 | 1155.0 | 1121.5 | 1107.9 |
| 65°    | 1081.1 | 1060.7 | 1027.1 | 996.8  | 980.0  |
| 67.5°  | 946.4  | 929.3  | 899.2  | 875.7  | 862.1  |
| 70°    | 821.7  | 808.1  | 777.8  | 754.2  | 741.0  |
| 72.5°  | 693.8  | 680.2  | 663.4  | 639.9  | 629.9  |
| 75°    | 565.6  | 559.1  | 542.0  | 522.0  | 528.8  |
| 77.5°  | 451.2  | 437.7  | 430.9  | 420.9  | 410.9  |
| 80°    | 336.9  | 333.3  | 326.5  | 316.5  | 309.8  |
| 82.5°  | 229.0  | 229.0  | 225.8  | 212.2  | 212.2  |
| 85°    | 137.9  | 134.7  | 131.5  | 121.1  | 117.9  |
| 87.5°  | 60.7   | 53.9   | 47.2   | 37.2   | 33.6   |
| 90°    | 2.8    | 35.1   | 58.5   | 73.4   | 79.0   |
| 92.5°  | 73.4   | 61.6   | 70.3   | 76.2   | 79.0   |
| 95°    | 190.3  | 93.6   | 114.1  | 129.1  | 126.0  |
| 97.5°  | 342.8  | 102.7  | 149.3  | 158.3  | 161.1  |
| 100°   | 518.8  | 117.3  | 167.0  | 190.3  | 196.3  |
| 102.5° | 712.0  | 706.4  | 172.9  | 205.0  | 214.0  |
| 105°   | 890.8  | 978.9  | 178.9  | 210.9  | 222.7  |
| 107.5° | 1098.9 | 1172.0 | 184.8  | 216.8  | 228.6  |
| 110°   | 1298.3 | 1359.6 | 512.9  | 219.9  | 231.4  |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 1485.9 | 1538.4 | 1488.7 | 225.5  | 234.5  |
| 115°   | 1684.9 | 1734.7 | 1808.1 | 451.3  | 240.5  |
| 117.5° | 1857.9 | 1916.4 | 1966.5 | 1547.1 | 779.5  |
| 120°   | 2051.4 | 2095.2 | 2148.1 | 2183.3 | 1787.6 |
| 122.5° | 2215.3 | 2262.3 | 2321.1 | 2338.5 | 2341.6 |
| 125°   | 2382.3 | 2420.6 | 2476.3 | 2496.8 | 2505.5 |
| 127.5° | 2534.7 | 2575.8 | 2620.0 | 2649.2 | 2652.0 |
| 130°   | 2678.4 | 2725.4 | 2757.4 | 2789.8 | 2787.0 |
| 132.5° | 2824.9 | 2863.2 | 2895.2 | 2921.7 | 2918.9 |
| 135°   | 2948.1 | 2995.1 | 3021.2 | 3050.8 | 3044.9 |
| 137.5° | 3076.9 | 3112.0 | 3141.6 | 3170.8 | 3162.1 |
| 140°   | 3202.9 | 3226.5 | 3258.5 | 3285.0 | 3270.4 |
| 142.5° | 3308.6 | 3329.2 | 3367.1 | 3390.4 | 3375.8 |
| 145°   | 3420.0 | 3416.9 | 3466.6 | 3487.2 | 3472.5 |
| 147.5° | 3516.4 | 3507.7 | 3557.5 | 3572.1 | 3560.6 |
| 150°   | 3610.3 | 3589.8 | 3636.8 | 3654.2 | 3639.6 |
| 152.5° | 3689.3 | 3666.0 | 3709.9 | 3727.6 | 3707.1 |
| 155°   | 3765.5 | 3739.4 | 3774.6 | 3792.0 | 3768.7 |
| 157.5° | 3827.1 | 3803.8 | 3830.3 | 3850.8 | 3827.1 |
| 160°   | 3880.0 | 3862.3 | 3880.0 | 3897.4 | 3876.9 |
| 162.5° | 3926.7 | 3909.3 | 3923.9 | 3944.4 | 3918.0 |
| 165°   | 3967.7 | 3950.3 | 3959.0 | 3979.6 | 3959.0 |
| 167.5° | 4000.1 | 3982.3 | 3991.4 | 4011.9 | 3985.5 |
| 170°   | 4026.5 | 4008.8 | 4014.7 | 4035.2 | 4008.8 |
| 172.5° | 4043.9 | 4026.5 | 4032.5 | 4053.0 | 4026.5 |
| 175°   | 4058.5 | 4038.0 | 4043.9 | 4064.5 | 4035.2 |
| 177.5° | 4064.5 | 4043.9 | 4047.1 | 4067.6 | 4041.2 |
| 180°   | 4049.9 | 4049.9 | 4049.9 | 4049.9 | 4049.9 |

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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 | 9.84             | 10.65 | 10.86 | 11.67 | 13.04 | 9.40           | 10.21 | 10.42 | 11.23 | 12.60 |
|                 | 3H   | 11.50            | 12.22 | 12.53 | 13.26 | 14.64 | 11.02          | 11.74 | 12.05 | 12.77 | 14.16 |
|                 | 4H   | 12.09            | 12.77 | 13.13 | 13.81 | 15.20 | 11.60          | 12.28 | 12.64 | 13.32 | 14.72 |
|                 | 6H   | 12.49            | 13.12 | 13.54 | 14.16 | 15.57 | 12.00          | 12.62 | 13.05 | 13.66 | 15.07 |
|                 | 8H   | 12.59            | 13.19 | 13.65 | 14.25 | 15.65 | 12.10          | 12.70 | 13.15 | 13.75 | 15.16 |
|                 | 12H  | 12.64            | 13.21 | 13.70 | 14.26 | 15.69 | 12.14          | 12.71 | 13.20 | 13.76 | 15.19 |
| 4H              | 2H   | 10.30            | 10.98 | 11.34 | 12.02 | 13.41 | 9.95           | 10.63 | 10.99 | 11.66 | 13.06 |
|                 | 3H   | 12.16            | 12.73 | 13.22 | 13.79 | 15.20 | 11.76          | 12.33 | 12.81 | 13.39 | 14.80 |
|                 | 4H   | 12.88            | 13.40 | 13.94 | 14.45 | 15.88 | 12.46          | 12.98 | 13.52 | 14.04 | 15.47 |
|                 | 6H   | 13.39            | 13.84 | 14.46 | 14.92 | 16.34 | 12.97          | 13.41 | 14.04 | 14.49 | 15.92 |
|                 | 8H   | 13.54            | 13.96 | 14.61 | 15.03 | 16.47 | 13.11          | 13.53 | 14.18 | 14.60 | 16.04 |
|                 | 12H  | 13.61            | 13.99 | 14.70 | 15.08 | 16.52 | 13.17          | 13.55 | 14.26 | 14.64 | 16.08 |
| 8H              | 4H   | 13.07            | 13.49 | 14.14 | 14.56 | 16.00 | 12.70          | 13.12 | 13.77 | 14.19 | 15.63 |
|                 | 6H   | 13.70            | 14.05 | 14.79 | 15.16 | 16.60 | 13.32          | 13.67 | 14.42 | 14.78 | 16.22 |
|                 | 8H   | 13.92            | 14.23 | 15.02 | 15.32 | 16.78 | 13.54          | 13.84 | 14.64 | 14.94 | 16.40 |
|                 | 12H  | 14.05            | 14.32 | 15.16 | 15.41 | 16.91 | 13.65          | 13.92 | 14.76 | 15.01 | 16.51 |
| 12H             | 4H   | 13.05            | 13.43 | 14.14 | 14.51 | 15.96 | 12.69          | 13.07 | 13.78 | 14.15 | 15.60 |
|                 | 6H   | 13.73            | 14.03 | 14.83 | 15.13 | 16.59 | 13.37          | 13.67 | 14.46 | 14.77 | 16.22 |
|                 | 8H   | 13.97            | 14.24 | 15.07 | 15.33 | 16.83 | 13.60          | 13.87 | 14.70 | 14.96 | 16.46 |