

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: P903422

Luminaire Tested: DFN2DIP-PN4F0-110D100US830-RLLFLL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P903422  
REPORT IS A COMBINATION OF REPORTS P899732 AND P896497  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-PN4F0-110D100US830-RLLFLL  
Description: 4 foot, Pentagon Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

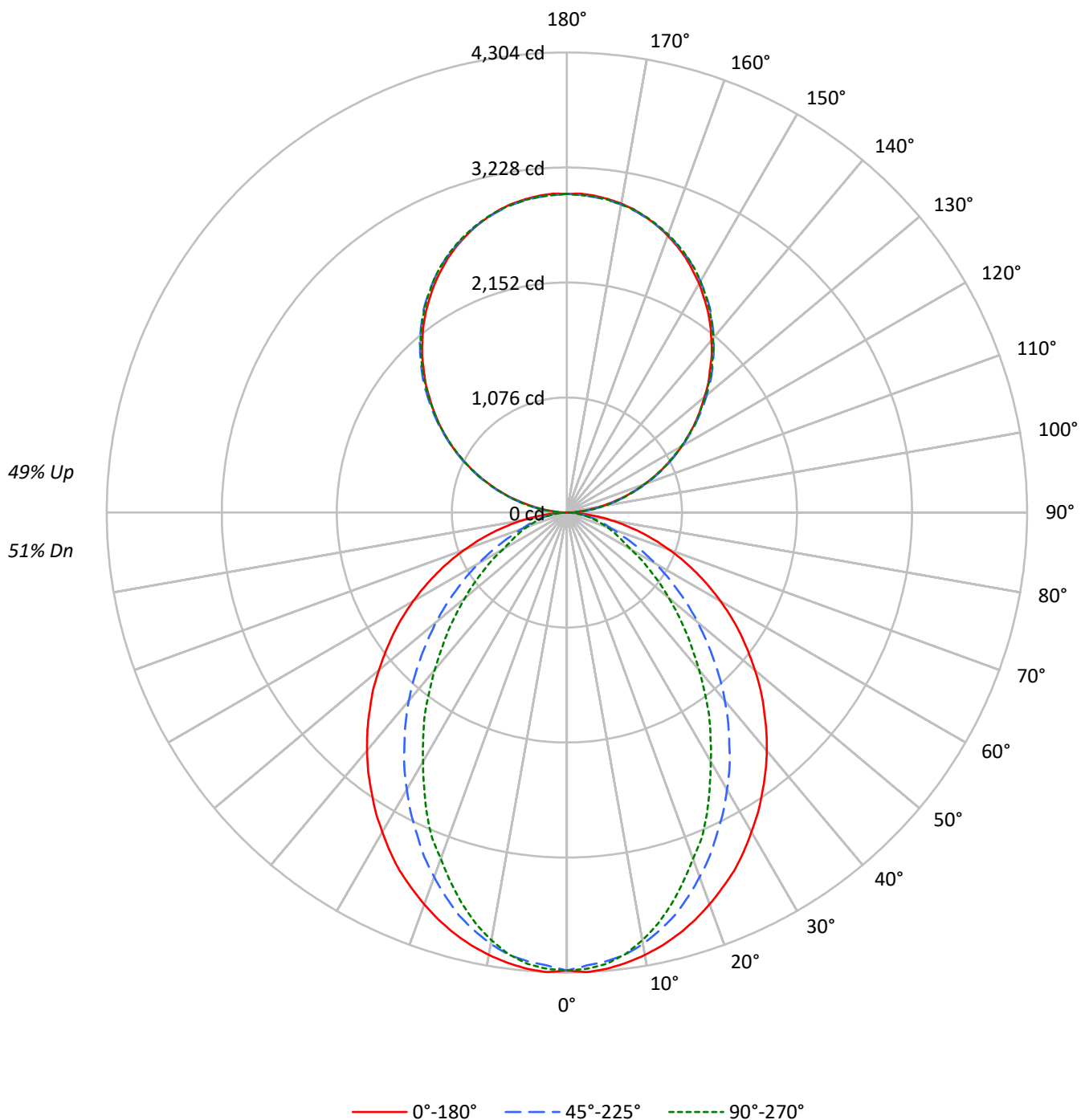
**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 17154.3 lumens  
Efficiency: N/A  
Efficacy: 90.7 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 0.99 / 1.16  
Luminous Opening: Rectangular w/ Sides (W: 3.74' x L: 3.94' x H: 0.1')  
CIE Type: General Diffuse  
  
Input Watts (W): 189.2  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.996  
Total Harmonic Distortion (THDi): 0.064  
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: P903422

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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 |
| RCR |     |     |     |     |    |    |    |    |    |    |    |  |    |    |    |  |    |
| 0   | 107 | 107 | 107 | 107 | 99 | 99 | 99 | 99 | 84 | 84 | 84 |  | 70 | 70 | 70 |  | 57 |
| 1   | 99  | 94  | 91  | 87  | 91 | 87 | 84 | 81 | 74 | 72 | 70 |  | 63 | 61 | 59 |  | 52 |
| 2   | 90  | 83  | 77  | 72  | 83 | 77 | 72 | 68 | 66 | 62 | 59 |  | 56 | 53 | 50 |  | 46 |
| 3   | 83  | 73  | 66  | 61  | 76 | 68 | 62 | 57 | 59 | 54 | 50 |  | 50 | 46 | 43 |  | 41 |
| 4   | 76  | 65  | 58  | 52  | 70 | 61 | 54 | 49 | 52 | 47 | 43 |  | 44 | 41 | 37 |  | 37 |
| 5   | 70  | 58  | 51  | 45  | 64 | 55 | 48 | 42 | 47 | 42 | 38 |  | 40 | 36 | 33 |  | 34 |
| 6   | 64  | 53  | 45  | 39  | 59 | 49 | 42 | 37 | 43 | 37 | 33 |  | 36 | 32 | 29 |  | 31 |
| 7   | 60  | 48  | 40  | 34  | 55 | 45 | 38 | 33 | 39 | 33 | 29 |  | 33 | 29 | 26 |  | 28 |
| 8   | 55  | 43  | 36  | 31  | 51 | 41 | 34 | 29 | 36 | 30 | 26 |  | 31 | 26 | 23 |  | 26 |
| 9   | 52  | 40  | 32  | 27  | 48 | 37 | 31 | 26 | 33 | 27 | 24 |  | 28 | 24 | 21 |  | 24 |
| 10  | 48  | 37  | 29  | 25  | 45 | 34 | 28 | 24 | 30 | 25 | 21 |  | 26 | 22 | 19 |  | 22 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 3128 | 3128 | 3128 |
| 5°  | 3133 | 3079 | 3099 |
| 10° | 3102 | 3019 | 2998 |
| 15° | 3059 | 2919 | 2843 |
| 20° | 3003 | 2782 | 2652 |
| 25° | 2945 | 2628 | 2468 |
| 30° | 2867 | 2471 | 2234 |
| 35° | 2791 | 2301 | 2028 |
| 40° | 2714 | 2125 | 1793 |
| 45° | 2624 | 1931 | 1579 |
| 50° | 2531 | 1734 | 1370 |
| 55° | 2433 | 1524 | 1170 |
| 60° | 2321 | 1304 | 963  |
| 65° | 2192 | 1080 | 868  |
| 70° | 2035 | 872  | 786  |
| 75° | 1838 | 769  | 717  |
| 80° | 1552 | 647  | 624  |
| 85° | 1081 | 434  | 472  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 2624 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 401.6   | 2.3       |
| 10°-20°   | 1102.5  | 6.4       |
| 20°-30°   | 1547.8  | 9.0       |
| 30°-40°   | 1687.2  | 9.8       |
| 40°-50°   | 1550.8  | 9.0       |
| 50°-60°   | 1217.9  | 7.1       |
| 60°-70°   | 792.7   | 4.6       |
| 70°-80°   | 408.1   | 2.4       |
| 80°-90°   | 112.6   | 0.7       |
| 90°-100°  | 184.5   | 1.1       |
| 100°-110° | 586.1   | 3.4       |
| 110°-120° | 1003.0  | 5.8       |
| 120°-130° | 1319.1  | 7.7       |
| 130°-140° | 1480.6  | 8.6       |
| 140°-150° | 1451.9  | 8.5       |
| 150°-160° | 1217.9  | 7.1       |
| 160°-170° | 807.7   | 4.7       |
| 170°-180° | 282.3   | 1.6       |
| 0°-30°    | 3051.9  | 17.8      |
| 0°-40°    | 4739.1  | 27.6      |
| 0°-60°    | 7507.8  | 43.8      |
| 0°-90°    | 8821.2  | 51.4      |
| 90°-120°  | 1773.5  | 10.3      |
| 90°-150°  | 6025.1  | 35.1      |
| 90°-180°  | 8333.0  | 48.6      |
| 0°-180°   | 17154.3 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 4285 | 4285  | 4285 | 4285  | 4285 |      |
| 5°   | 4285 | 4266  | 4215 | 4250  | 4239 | 406  |
| 15°  | 4076 | 4033  | 3901 | 3828  | 3789 | 1148 |
| 25°  | 3700 | 3575  | 3319 | 3161  | 3102 | 1701 |
| 35°  | 3188 | 2990  | 2649 | 2404  | 2319 | 1995 |
| 45°  | 2606 | 2346  | 1939 | 1663  | 1570 | 2013 |
| 55°  | 1981 | 1679  | 1260 | 1028  | 954  | 1771 |
| 65°  | 1338 | 1024  | 675  | 543   | 531  | 1326 |
| 75°  | 713  | 442   | 310  | 283   | 279  | 755  |
| 85°  | 167  | 85    | 74   | 74    | 74   | 191  |
| 90°  | 3    | 32    | 88   | 83    | 85   | 17   |
| 95°  | 131  | 156   | 161  | 161   | 156  | 146  |
| 105° | 541  | 548   | 554  | 558   | 558  | 571  |
| 115° | 1006 | 1021  | 1016 | 1014  | 1006 | 996  |
| 125° | 1464 | 1486  | 1479 | 1471  | 1468 | 1308 |
| 135° | 1894 | 1921  | 1927 | 1924  | 1917 | 1464 |
| 145° | 2299 | 2317  | 2331 | 2334  | 2324 | 1436 |
| 155° | 2629 | 2636  | 2644 | 2656  | 2648 | 1210 |
| 165° | 2860 | 2857  | 2857 | 2875  | 2862 | 807  |
| 175° | 2976 | 2968  | 2963 | 2981  | 2966 | 283  |
| 180° | 2981 | 2981  | 2981 | 2981  | 2981 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 4285.1 | 4285.1 | 4285.1 | 4285.1 | 4285.1 |
| 2.5°   | 4304.4 | 4285.1 | 4242.3 | 4281.4 | 4273.6 |
| 5°     | 4285.1 | 4265.8 | 4215.1 | 4250.1 | 4238.6 |
| 7.5°   | 4250.1 | 4227.0 | 4172.7 | 4188.0 | 4168.6 |
| 10°    | 4203.6 | 4176.4 | 4099.1 | 4087.1 | 4064.1 |
| 12.5°  | 4145.6 | 4110.6 | 4005.7 | 3982.6 | 3939.8 |
| 15°    | 4075.6 | 4032.9 | 3901.2 | 3827.6 | 3788.8 |
| 17.5°  | 3994.2 | 3932.1 | 3769.1 | 3683.9 | 3621.8 |
| 20°    | 3901.2 | 3823.4 | 3629.6 | 3532.9 | 3447.3 |
| 22.5°  | 3800.4 | 3711.1 | 3486.1 | 3354.4 | 3296.4 |
| 25°    | 3699.6 | 3575.3 | 3319.4 | 3160.6 | 3102.2 |
| 27.5°  | 3579.5 | 3447.3 | 3164.3 | 2982.0 | 2892.8 |
| 30°    | 3451.5 | 3303.8 | 2993.6 | 2796.1 | 2691.1 |
| 32.5°  | 3327.3 | 3148.7 | 2831.0 | 2598.2 | 2501.1 |
| 35°    | 3187.8 | 2989.8 | 2648.8 | 2404.4 | 2318.8 |
| 37.5°  | 3052.0 | 2838.5 | 2478.0 | 2210.2 | 2113.6 |
| 40°    | 2908.4 | 2676.0 | 2299.5 | 2024.2 | 1923.4 |
| 42.5°  | 2761.1 | 2513.0 | 2121.4 | 1834.2 | 1737.5 |
| 45°    | 2606.0 | 2346.0 | 1939.1 | 1663.4 | 1570.5 |
| 47.5°  | 2458.7 | 2183.5 | 1764.6 | 1488.9 | 1403.8 |
| 50°    | 2295.8 | 2020.5 | 1593.9 | 1326.1 | 1245.0 |
| 52.5°  | 2136.6 | 1845.7 | 1431.0 | 1175.1 | 1101.4 |
| 55°    | 1981.4 | 1679.0 | 1260.2 | 1027.7 | 954.1  |
| 57.5°  | 1822.7 | 1512.4 | 1109.2 | 892.0  | 829.8  |
| 60°    | 1659.7 | 1349.5 | 950.0  | 752.5  | 690.4  |
| 62.5°  | 1500.9 | 1190.7 | 814.3  | 628.3  | 597.4  |
| 65°    | 1337.9 | 1023.6 | 674.8  | 543.1  | 531.1  |
| 67.5°  | 1182.9 | 868.6  | 543.1  | 476.8  | 465.3  |
| 70°    | 1019.9 | 717.6  | 449.7  | 411.0  | 395.4  |
| 72.5°  | 864.8  | 577.7  | 376.1  | 345.2  | 337.3  |
| 75°    | 713.4  | 441.9  | 310.2  | 283.0  | 279.4  |
| 77.5°  | 562.4  | 314.0  | 244.4  | 228.8  | 220.9  |
| 80°    | 422.5  | 225.1  | 186.0  | 170.8  | 170.8  |
| 82.5°  | 294.5  | 151.4  | 128.0  | 120.2  | 120.2  |
| 85°    | 166.6  | 85.2   | 73.6   | 73.6   | 73.6   |
| 87.5°  | 62.1   | 30.8   | 30.8   | 27.1   | 27.1   |
| 90°    | 2.7    | 32.3   | 88.0   | 82.7   | 85.4   |
| 92.5°  | 55.7   | 75.5   | 78.2   | 80.9   | 80.9   |
| 95°    | 131.2  | 156.4  | 160.9  | 160.9  | 156.4  |
| 97.5°  | 218.4  | 241.8  | 251.7  | 251.7  | 251.7  |
| 100°   | 319.1  | 339.7  | 346.9  | 346.9  | 344.2  |
| 102.5° | 425.1  | 440.4  | 450.3  | 452.9  | 450.3  |
| 105°   | 541.0  | 548.2  | 553.6  | 558.1  | 558.1  |
| 107.5° | 656.0  | 666.8  | 666.8  | 668.6  | 656.0  |
| 110°   | 767.5  | 781.8  | 781.8  | 781.8  | 774.7  |



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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 887.9  | 903.1  | 900.5  | 893.2  | 887.9  |
| 115°   | 1006.5 | 1020.9 | 1016.4 | 1013.7 | 1006.5 |
| 117.5° | 1124.3 | 1144.1 | 1131.4 | 1124.3 | 1117.0 |
| 120°   | 1242.8 | 1262.6 | 1242.8 | 1242.8 | 1234.8 |
| 122.5° | 1350.7 | 1375.8 | 1363.3 | 1356.1 | 1350.7 |
| 125°   | 1464.0 | 1486.4 | 1479.2 | 1471.1 | 1468.5 |
| 127.5° | 1574.5 | 1602.3 | 1592.4 | 1581.7 | 1574.5 |
| 130°   | 1677.8 | 1710.1 | 1705.7 | 1700.3 | 1690.4 |
| 132.5° | 1793.8 | 1818.9 | 1820.7 | 1808.2 | 1800.9 |
| 135°   | 1893.5 | 1921.4 | 1926.7 | 1924.1 | 1916.8 |
| 137.5° | 2005.0 | 2027.4 | 2031.9 | 2030.1 | 2019.3 |
| 140°   | 2102.9 | 2125.3 | 2138.0 | 2138.0 | 2128.1 |
| 142.5° | 2203.6 | 2226.0 | 2233.2 | 2235.9 | 2226.0 |
| 145°   | 2298.8 | 2316.8 | 2331.2 | 2333.8 | 2323.9 |
| 147.5° | 2384.2 | 2406.7 | 2417.4 | 2422.0 | 2412.1 |
| 150°   | 2472.3 | 2487.6 | 2497.5 | 2505.5 | 2497.5 |
| 152.5° | 2550.4 | 2565.7 | 2578.3 | 2588.2 | 2578.3 |
| 155°   | 2628.7 | 2635.8 | 2643.9 | 2656.5 | 2648.4 |
| 157.5° | 2696.0 | 2701.4 | 2705.9 | 2723.9 | 2711.3 |
| 160°   | 2756.3 | 2761.6 | 2764.3 | 2779.6 | 2768.8 |
| 162.5° | 2812.0 | 2812.0 | 2814.6 | 2831.7 | 2819.1 |
| 165°   | 2859.6 | 2856.8 | 2856.8 | 2874.8 | 2862.3 |
| 167.5° | 2902.7 | 2894.6 | 2894.6 | 2912.6 | 2900.0 |
| 170°   | 2935.1 | 2927.9 | 2925.2 | 2943.2 | 2927.9 |
| 172.5° | 2957.5 | 2950.3 | 2947.6 | 2965.6 | 2950.3 |
| 175°   | 2975.5 | 2968.3 | 2963.0 | 2980.9 | 2965.6 |
| 177.5° | 2985.4 | 2978.2 | 2972.8 | 2988.0 | 2972.8 |
| 180°   | 2980.9 | 2980.9 | 2980.9 | 2980.9 | 2980.9 |

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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 | 11.25            | 12.09 | 12.20 | 13.05 | 14.31 | 7.21           | 8.05  | 8.16  | 9.02  | 10.27 |
|                 | 3H   | 12.93            | 13.68 | 13.89 | 14.65 | 15.93 | 8.40           | 9.15  | 9.37  | 10.13 | 11.40 |
|                 | 4H   | 13.54            | 14.25 | 14.52 | 15.23 | 16.51 | 8.85           | 9.57  | 9.83  | 10.54 | 11.83 |
|                 | 6H   | 13.96            | 14.62 | 14.95 | 15.60 | 16.90 | 9.18           | 9.83  | 10.16 | 10.81 | 12.11 |
|                 | 8H   | 14.09            | 14.72 | 15.09 | 15.71 | 17.01 | 9.27           | 9.89  | 10.26 | 10.89 | 12.18 |
|                 | 12H  | 14.16            | 14.75 | 15.15 | 15.74 | 17.06 | 9.31           | 9.90  | 10.31 | 10.90 | 12.21 |
| 4H              | 2H   | 11.27            | 11.98 | 12.25 | 12.95 | 14.24 | 7.81           | 8.52  | 8.79  | 9.50  | 10.78 |
|                 | 3H   | 13.10            | 13.69 | 14.09 | 14.70 | 16.00 | 9.16           | 9.75  | 10.15 | 10.76 | 12.06 |
|                 | 4H   | 13.80            | 14.34 | 14.80 | 15.33 | 16.66 | 9.71           | 10.25 | 10.71 | 11.25 | 12.57 |
|                 | 6H   | 14.31            | 14.78 | 15.33 | 15.80 | 17.12 | 10.13          | 10.60 | 11.14 | 11.62 | 12.94 |
|                 | 8H   | 14.49            | 14.92 | 15.50 | 15.94 | 17.27 | 10.26          | 10.70 | 11.28 | 11.71 | 13.05 |
|                 | 12H  | 14.59            | 14.98 | 15.62 | 16.01 | 17.35 | 10.33          | 10.72 | 11.36 | 11.75 | 13.09 |
| 8H              | 4H   | 13.76            | 14.20 | 14.78 | 15.21 | 16.55 | 9.99           | 10.43 | 11.01 | 11.44 | 12.78 |
|                 | 6H   | 14.33            | 14.69 | 15.37 | 15.75 | 17.08 | 10.51          | 10.87 | 11.55 | 11.93 | 13.26 |
|                 | 8H   | 14.55            | 14.87 | 15.60 | 15.91 | 17.26 | 10.71          | 11.02 | 11.75 | 12.07 | 13.42 |
|                 | 12H  | 14.69            | 14.97 | 15.74 | 16.01 | 17.40 | 10.83          | 11.10 | 11.88 | 12.14 | 13.54 |
| 12H             | 4H   | 13.72            | 14.11 | 14.75 | 15.14 | 16.48 | 10.00          | 10.39 | 11.03 | 11.42 | 12.76 |
|                 | 6H   | 14.31            | 14.62 | 15.35 | 15.67 | 17.02 | 10.56          | 10.88 | 11.61 | 11.92 | 13.27 |
|                 | 8H   | 14.53            | 14.81 | 15.58 | 15.85 | 17.24 | 10.78          | 11.05 | 11.82 | 12.09 | 13.49 |