

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: P927438

Luminaire Tested: DFN2DIP-HX4F0-100D100US835-RLLONL

Issue Date: 12/12/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P927438  
REPORT IS A COMBINATION OF REPORTS P900940 AND P896187  
Test Lab: INNOVATION CENTER  
Issue Date: 12/12/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-HX4F0-100D100US835-RLLONL  
Description: 4 foot, Hexagon Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

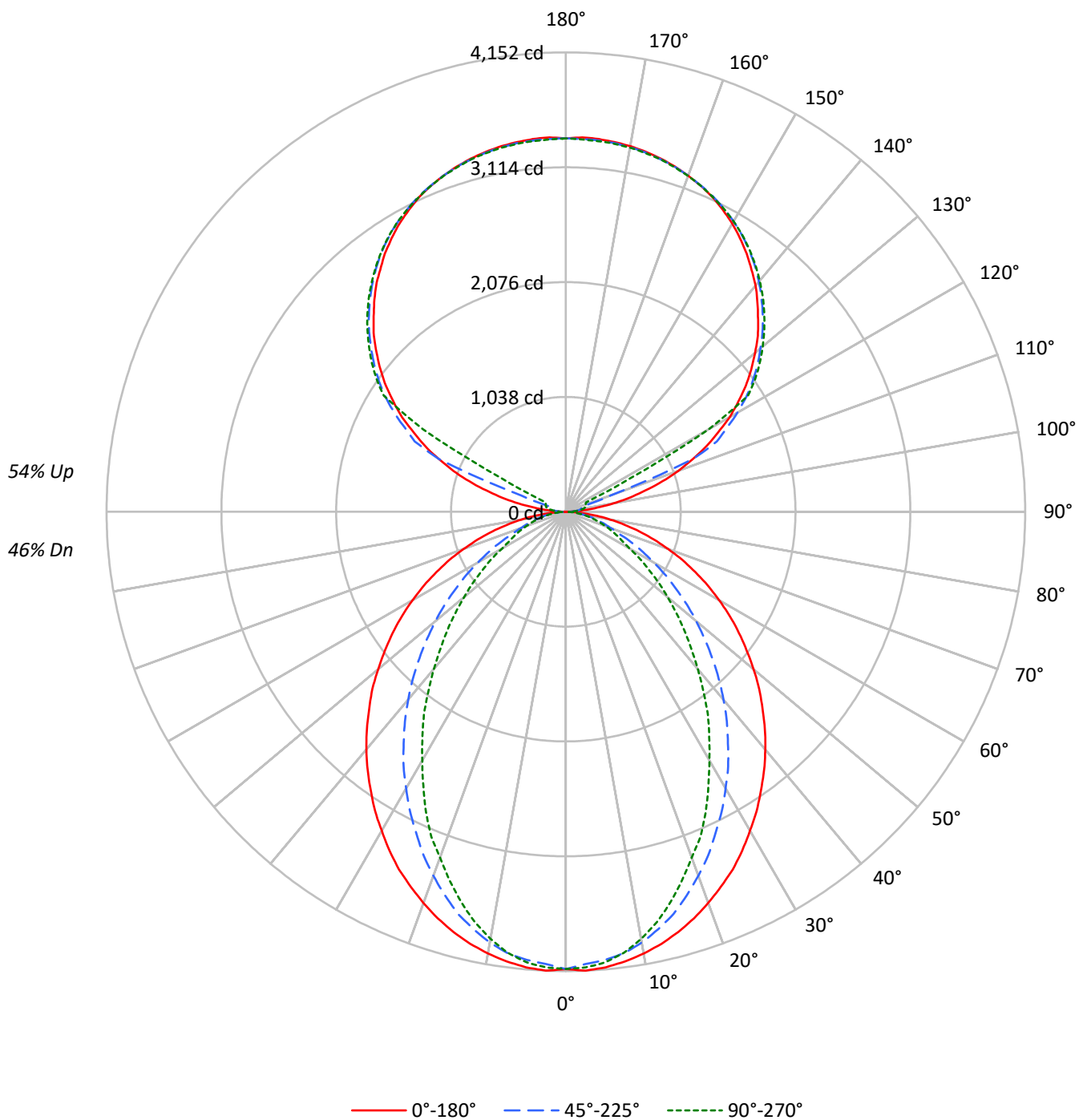
**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 18400.0 lumens  
Efficiency: N/A  
Efficacy: 104.8 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 0.99 / 1.16  
Luminous Opening: Rectangular w/ Sides (W: 3.54' x L: 4.09' x H: 0.1')  
CIE Type: General Diffuse  
  
Input Watts (W): 175.5  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.946  
Total Harmonic Distortion (THDi): 0.132  
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 |    |    |    |    | 0  |
| 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°  | 3073 | 3073 | 3073 |
| 5°  | 3078 | 3025 | 3044 |
| 10° | 3048 | 2966 | 2945 |
| 15° | 3006 | 2868 | 2792 |
| 20° | 2951 | 2733 | 2604 |
| 25° | 2895 | 2582 | 2423 |
| 30° | 2818 | 2427 | 2193 |
| 35° | 2744 | 2260 | 1991 |
| 40° | 2668 | 2088 | 1759 |
| 45° | 2580 | 1896 | 1549 |
| 50° | 2489 | 1703 | 1344 |
| 55° | 2394 | 1496 | 1147 |
| 60° | 2284 | 1280 | 944  |
| 65° | 2157 | 1060 | 850  |
| 70° | 2004 | 855  | 769  |
| 75° | 1811 | 755  | 700  |
| 80° | 1532 | 634  | 608  |
| 85° | 1071 | 425  | 458  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 2580 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 387.3   | 2.1       |
| 10°-20°   | 1063.3  | 5.8       |
| 20°-30°   | 1492.9  | 8.1       |
| 30°-40°   | 1627.4  | 8.8       |
| 40°-50°   | 1495.7  | 8.1       |
| 50°-60°   | 1174.7  | 6.4       |
| 60°-70°   | 764.6   | 4.2       |
| 70°-80°   | 393.6   | 2.1       |
| 80°-90°   | 106.4   | 0.6       |
| 90°-100°  | 111.3   | 0.6       |
| 100°-110° | 414.9   | 2.3       |
| 110°-120° | 1100.3  | 6.0       |
| 120°-130° | 1824.9  | 9.9       |
| 130°-140° | 1938.4  | 10.5      |
| 140°-150° | 1801.5  | 9.8       |
| 150°-160° | 1448.4  | 7.9       |
| 160°-170° | 933.3   | 5.1       |
| 170°-180° | 321.2   | 1.7       |
| 0°-30°    | 2943.6  | 16.0      |
| 0°-40°    | 4571.0  | 24.8      |
| 0°-60°    | 7241.3  | 39.4      |
| 0°-90°    | 8505.9  | 46.2      |
| 90°-120°  | 1626.4  | 8.8       |
| 90°-150°  | 7191.2  | 39.1      |
| 90°-180°  | 9894.0  | 53.8      |
| 0°-180°   | 18400.0 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 4133 | 4133  | 4133 | 4133  | 4133 |      |
| 5°   | 4133 | 4114  | 4066 | 4099  | 4088 | 392  |
| 15°  | 3931 | 3890  | 3763 | 3692  | 3654 | 1108 |
| 25°  | 3568 | 3448  | 3202 | 3048  | 2992 | 1641 |
| 35°  | 3075 | 2884  | 2555 | 2319  | 2236 | 1924 |
| 45°  | 2514 | 2263  | 1870 | 1604  | 1515 | 1941 |
| 55°  | 1911 | 1620  | 1216 | 991   | 920  | 1708 |
| 65°  | 1290 | 987   | 651  | 524   | 512  | 1279 |
| 75°  | 688  | 426   | 299  | 273   | 269  | 728  |
| 85°  | 161  | 82    | 71   | 71    | 71   | 184  |
| 90°  | 2    | 29    | 49   | 61    | 66   | 17   |
| 95°  | 159  | 78    | 95   | 108   | 105  | 188  |
| 105° | 742  | 816   | 149  | 176   | 186  | 793  |
| 115° | 1404 | 1446  | 1507 | 376   | 200  | 1382 |
| 125° | 1985 | 2017  | 2064 | 2081  | 2088 | 1771 |
| 135° | 2457 | 2496  | 2518 | 2542  | 2537 | 1898 |
| 145° | 2850 | 2847  | 2889 | 2906  | 2894 | 1782 |
| 155° | 3138 | 3116  | 3146 | 3160  | 3141 | 1446 |
| 165° | 3306 | 3292  | 3299 | 3316  | 3299 | 934  |
| 175° | 3382 | 3365  | 3370 | 3387  | 3363 | 322  |
| 180° | 3375 | 3375  | 3375 | 3375  | 3375 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 4133.0 | 4133.0 | 4133.0 | 4133.0 | 4133.0 |
| 2.5°   | 4151.6 | 4133.0 | 4091.7 | 4129.4 | 4121.9 |
| 5°     | 4133.0 | 4114.3 | 4065.5 | 4099.3 | 4088.1 |
| 7.5°   | 4099.3 | 4077.0 | 4024.6 | 4039.3 | 4020.7 |
| 10°    | 4054.4 | 4028.2 | 3953.6 | 3942.1 | 3919.9 |
| 12.5°  | 3998.5 | 3964.7 | 3863.5 | 3841.3 | 3800.0 |
| 15°    | 3931.0 | 3889.7 | 3762.7 | 3691.7 | 3654.4 |
| 17.5°  | 3852.4 | 3792.5 | 3635.4 | 3553.2 | 3493.3 |
| 20°    | 3762.7 | 3687.7 | 3500.8 | 3407.6 | 3325.0 |
| 22.5°  | 3665.5 | 3579.4 | 3362.3 | 3235.4 | 3179.4 |
| 25°    | 3568.3 | 3448.5 | 3201.6 | 3048.4 | 2992.1 |
| 27.5°  | 3452.4 | 3325.0 | 3052.0 | 2876.2 | 2790.1 |
| 30°    | 3329.0 | 3186.5 | 2887.3 | 2696.9 | 2595.7 |
| 32.5°  | 3209.2 | 3036.9 | 2730.6 | 2506.0 | 2412.3 |
| 35°    | 3074.6 | 2883.8 | 2554.8 | 2319.1 | 2236.5 |
| 37.5°  | 2943.7 | 2737.7 | 2390.1 | 2131.8 | 2038.5 |
| 40°    | 2805.2 | 2581.0 | 2217.9 | 1952.4 | 1855.2 |
| 42.5°  | 2663.1 | 2423.8 | 2046.1 | 1769.1 | 1675.8 |
| 45°    | 2513.5 | 2262.7 | 1870.3 | 1604.4 | 1514.7 |
| 47.5°  | 2371.5 | 2106.0 | 1702.0 | 1436.1 | 1354.0 |
| 50°    | 2214.3 | 1948.8 | 1537.3 | 1279.0 | 1200.8 |
| 52.5°  | 2060.7 | 1780.2 | 1380.2 | 1133.3 | 1062.3 |
| 55°    | 1911.1 | 1619.5 | 1215.5 | 991.3  | 920.2  |
| 57.5°  | 1758.0 | 1458.7 | 1069.9 | 860.3  | 800.4  |
| 60°    | 1600.8 | 1301.6 | 916.3  | 725.8  | 665.9  |
| 62.5°  | 1447.6 | 1148.4 | 785.3  | 606.0  | 576.2  |
| 65°    | 1290.5 | 987.3  | 650.8  | 523.8  | 512.3  |
| 67.5°  | 1140.9 | 837.7  | 523.8  | 459.9  | 448.8  |
| 70°    | 983.7  | 692.1  | 433.7  | 396.4  | 381.4  |
| 72.5°  | 834.1  | 557.1  | 362.7  | 332.9  | 325.4  |
| 75°    | 688.1  | 426.2  | 299.2  | 273.0  | 269.4  |
| 77.5°  | 542.5  | 302.8  | 235.7  | 220.6  | 213.1  |
| 80°    | 407.5  | 217.1  | 179.4  | 164.7  | 164.7  |
| 82.5°  | 284.1  | 146.0  | 123.4  | 115.9  | 115.9  |
| 85°    | 160.7  | 82.1   | 71.0   | 71.0   | 71.0   |
| 87.5°  | 59.9   | 29.8   | 29.8   | 26.2   | 26.2   |
| 90°    | 2.3    | 29.3   | 48.7   | 61.2   | 65.8   |
| 92.5°  | 61.2   | 51.3   | 58.6   | 63.5   | 65.8   |
| 95°    | 158.6  | 78.0   | 95.1   | 107.6  | 105.0  |
| 97.5°  | 285.6  | 85.5   | 124.4  | 131.9  | 134.3  |
| 100°   | 432.4  | 97.7   | 139.2  | 158.6  | 163.6  |
| 102.5° | 593.3  | 588.7  | 144.1  | 170.8  | 178.3  |
| 105°   | 742.4  | 815.7  | 149.1  | 175.7  | 185.6  |
| 107.5° | 915.8  | 976.7  | 154.0  | 180.7  | 190.5  |
| 110°   | 1081.9 | 1133.0 | 427.4  | 183.3  | 192.8  |



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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 1238.2 | 1282.0 | 1240.6 | 187.9  | 195.5  |
| 115°   | 1404.1 | 1445.6 | 1506.8 | 376.1  | 200.4  |
| 117.5° | 1548.2 | 1597.0 | 1638.7 | 1289.3 | 649.6  |
| 120°   | 1709.5 | 1746.0 | 1790.1 | 1819.4 | 1489.7 |
| 122.5° | 1846.1 | 1885.2 | 1934.2 | 1948.7 | 1951.3 |
| 125°   | 1985.3 | 2017.2 | 2063.6 | 2080.7 | 2087.9 |
| 127.5° | 2112.3 | 2146.5 | 2183.3 | 2207.7 | 2210.0 |
| 130°   | 2232.0 | 2271.2 | 2297.9 | 2324.8 | 2322.5 |
| 132.5° | 2354.1 | 2386.0 | 2412.7 | 2434.7 | 2432.4 |
| 135°   | 2456.8 | 2495.9 | 2517.7 | 2542.3 | 2537.4 |
| 137.5° | 2564.1 | 2593.4 | 2618.0 | 2642.4 | 2635.1 |
| 140°   | 2669.0 | 2688.8 | 2715.4 | 2737.5 | 2725.3 |
| 142.5° | 2757.2 | 2774.3 | 2805.9 | 2825.3 | 2813.2 |
| 145°   | 2850.0 | 2847.4 | 2888.9 | 2906.0 | 2893.8 |
| 147.5° | 2930.3 | 2923.1 | 2964.5 | 2976.7 | 2967.2 |
| 150°   | 3008.6 | 2991.5 | 3030.7 | 3045.2 | 3033.0 |
| 152.5° | 3074.4 | 3055.0 | 3091.6 | 3106.3 | 3089.2 |
| 155°   | 3138.0 | 3116.2 | 3145.5 | 3160.0 | 3140.6 |
| 157.5° | 3189.3 | 3169.9 | 3191.9 | 3209.0 | 3189.3 |
| 160°   | 3233.4 | 3218.6 | 3233.4 | 3247.9 | 3230.8 |
| 162.5° | 3272.2 | 3257.7 | 3269.9 | 3287.0 | 3265.0 |
| 165°   | 3306.4 | 3291.9 | 3299.2 | 3316.3 | 3299.2 |
| 167.5° | 3333.4 | 3318.6 | 3326.2 | 3343.3 | 3321.2 |
| 170°   | 3355.4 | 3340.7 | 3345.6 | 3362.7 | 3340.7 |
| 172.5° | 3369.9 | 3355.4 | 3360.4 | 3377.5 | 3355.4 |
| 175°   | 3382.1 | 3365.0 | 3369.9 | 3387.1 | 3362.7 |
| 177.5° | 3387.1 | 3369.9 | 3372.6 | 3389.7 | 3367.6 |
| 180°   | 3374.9 | 3374.9 | 3374.9 | 3374.9 | 3374.9 |

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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 | 10.69            | 11.49 | 11.68 | 12.49 | 13.81 | 6.66           | 7.46  | 7.65  | 8.46  | 9.79  |
|                 | 3H   | 12.36            | 13.08 | 13.37 | 14.09 | 15.44 | 7.85           | 8.56  | 8.85  | 9.57  | 10.92 |
|                 | 4H   | 12.97            | 13.65 | 13.99 | 14.66 | 16.02 | 8.30           | 8.97  | 9.32  | 9.99  | 11.34 |
|                 | 6H   | 13.39            | 14.01 | 14.42 | 15.03 | 16.40 | 8.62           | 9.24  | 9.65  | 10.26 | 11.63 |
|                 | 8H   | 13.52            | 14.11 | 14.55 | 15.14 | 16.51 | 8.71           | 9.30  | 9.74  | 10.34 | 11.70 |
|                 | 12H  | 13.58            | 14.14 | 14.62 | 15.17 | 16.56 | 8.75           | 9.31  | 9.79  | 10.34 | 11.73 |
| 4H              | 2H   | 10.70            | 11.38 | 11.73 | 12.39 | 13.75 | 7.25           | 7.93  | 8.28  | 8.94  | 10.30 |
|                 | 3H   | 12.53            | 13.09 | 13.56 | 14.13 | 15.50 | 8.60           | 9.16  | 9.63  | 10.21 | 11.57 |
|                 | 4H   | 13.22            | 13.73 | 14.26 | 14.77 | 16.16 | 9.15           | 9.66  | 10.19 | 10.70 | 12.09 |
|                 | 6H   | 13.73            | 14.18 | 14.78 | 15.23 | 16.62 | 9.57           | 10.01 | 10.62 | 11.07 | 12.46 |
|                 | 8H   | 13.91            | 14.32 | 14.96 | 15.37 | 16.78 | 9.70           | 10.11 | 10.75 | 11.16 | 12.56 |
|                 | 12H  | 14.00            | 14.38 | 15.07 | 15.44 | 16.85 | 9.76           | 10.13 | 10.83 | 11.20 | 12.61 |
| 8H              | 4H   | 13.19            | 13.60 | 14.24 | 14.65 | 16.05 | 9.43           | 9.84  | 10.48 | 10.89 | 12.29 |
|                 | 6H   | 13.75            | 14.09 | 14.83 | 15.19 | 16.58 | 9.95           | 10.29 | 11.02 | 11.38 | 12.78 |
|                 | 8H   | 13.97            | 14.27 | 15.05 | 15.35 | 16.76 | 10.14          | 10.44 | 11.22 | 11.51 | 12.93 |
|                 | 12H  | 14.11            | 14.37 | 15.19 | 15.44 | 16.90 | 10.26          | 10.52 | 11.34 | 11.59 | 13.05 |
| 12H             | 4H   | 13.14            | 13.51 | 14.20 | 14.57 | 15.98 | 9.43           | 9.80  | 10.50 | 10.87 | 12.28 |
|                 | 6H   | 13.73            | 14.03 | 14.81 | 15.10 | 16.52 | 10.00          | 10.30 | 11.08 | 11.37 | 12.79 |
|                 | 8H   | 13.95            | 14.21 | 15.03 | 15.28 | 16.74 | 10.21          | 10.47 | 11.29 | 11.54 | 13.00 |