

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: P928418

Luminaire Tested: DFN2DIP-HX4F0-100D120US927-RLLONL

Issue Date: 12/12/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P928418  
REPORT IS A COMBINATION OF REPORTS P900976 AND P896187  
Test Lab: INNOVATION CENTER  
Issue Date: 12/12/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-HX4F0-100D120US927-RLLONL  
Description: 4 foot, Hexagon Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

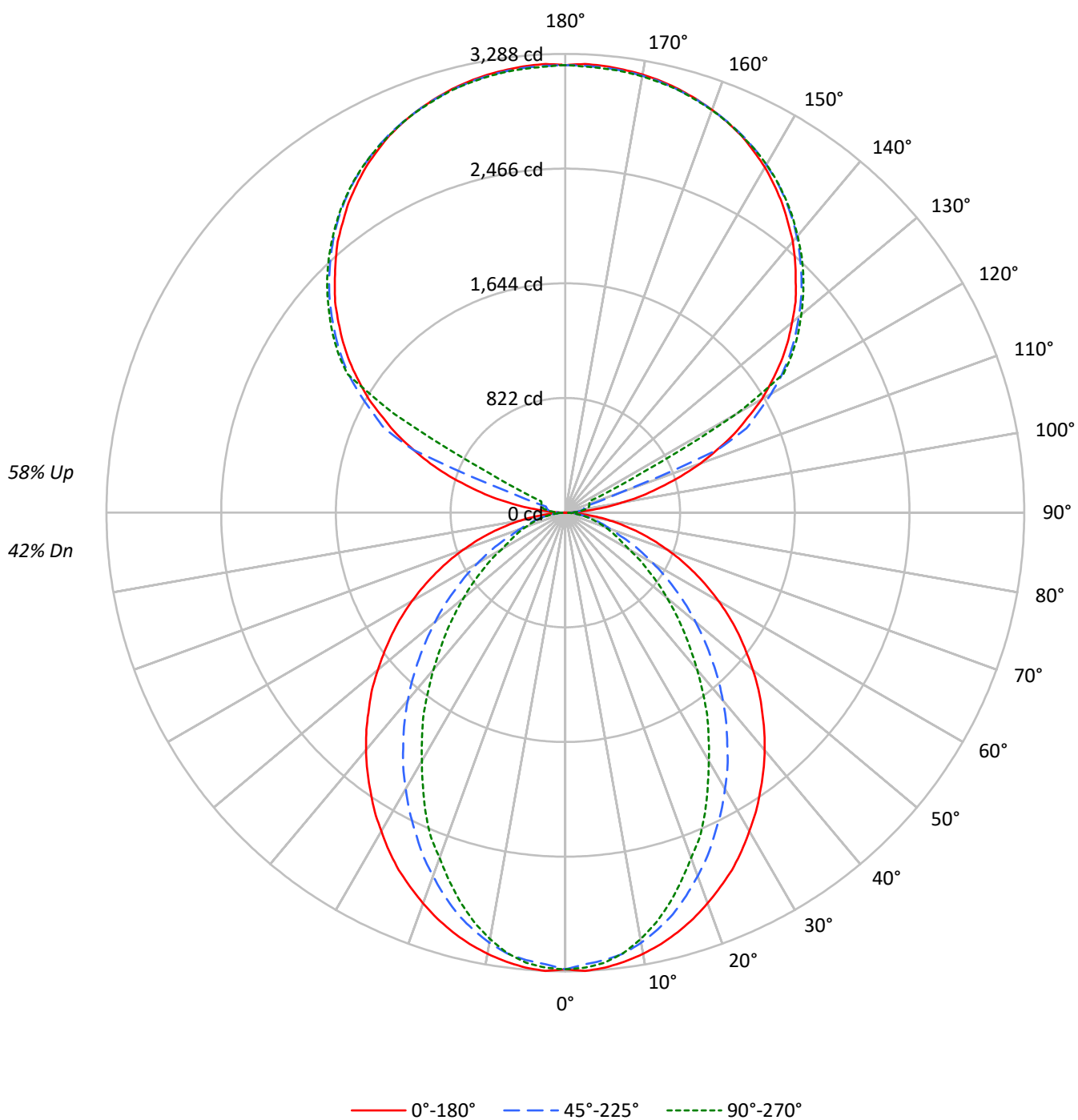
Lumens per Lamp: N/A  
Luminaire Lumens: 16140.9 lumens  
Efficiency: N/A  
Efficacy: 82.6 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 0.99 / 1.16  
Luminous Opening: Rectangular w/ Sides (W: 3.54' x L: 4.09' x H: 0.1')  
CIE Type: General Diffuse

Input Watts (W): 195.3  
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 |    |    |    | 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 | 63 | 63 | 63 | 49 | 49 | 49 |
| 1   | 96  | 92  | 89  | 85  | 88 | 84 | 81 | 78 | 70 | 67 | 65 | 56 | 55 | 53 | 43 | 43 | 42 |
| 2   | 88  | 81  | 75  | 70  | 80 | 74 | 69 | 65 | 61 | 58 | 55 | 50 | 47 | 45 | 39 | 37 | 36 |
| 3   | 81  | 72  | 65  | 59  | 73 | 66 | 60 | 55 | 55 | 50 | 46 | 44 | 41 | 39 | 35 | 33 | 31 |
| 4   | 74  | 64  | 56  | 50  | 67 | 58 | 52 | 47 | 49 | 44 | 40 | 40 | 36 | 33 | 31 | 29 | 27 |
| 5   | 68  | 57  | 49  | 43  | 62 | 52 | 45 | 40 | 44 | 39 | 35 | 36 | 32 | 29 | 28 | 26 | 24 |
| 6   | 63  | 51  | 43  | 38  | 57 | 47 | 40 | 35 | 39 | 34 | 30 | 32 | 29 | 26 | 26 | 23 | 21 |
| 7   | 58  | 46  | 38  | 33  | 53 | 43 | 36 | 31 | 36 | 31 | 27 | 30 | 26 | 23 | 24 | 21 | 19 |
| 8   | 54  | 42  | 34  | 29  | 49 | 39 | 32 | 27 | 33 | 28 | 24 | 27 | 23 | 20 | 22 | 19 | 17 |
| 9   | 50  | 38  | 31  | 26  | 46 | 35 | 29 | 25 | 30 | 25 | 22 | 25 | 21 | 18 | 20 | 17 | 15 |
| 10  | 47  | 35  | 28  | 23  | 43 | 33 | 26 | 22 | 28 | 23 | 19 | 23 | 19 | 17 | 19 | 16 | 14 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 2434 | 2434 | 2434 |
| 5°  | 2438 | 2396 | 2411 |
| 10° | 2414 | 2349 | 2332 |
| 15° | 2381 | 2271 | 2211 |
| 20° | 2337 | 2165 | 2063 |
| 25° | 2292 | 2045 | 1919 |
| 30° | 2232 | 1922 | 1737 |
| 35° | 2173 | 1790 | 1577 |
| 40° | 2113 | 1653 | 1393 |
| 45° | 2043 | 1502 | 1227 |
| 50° | 1971 | 1348 | 1064 |
| 55° | 1896 | 1185 | 908  |
| 60° | 1809 | 1014 | 748  |
| 65° | 1709 | 840  | 673  |
| 70° | 1587 | 677  | 609  |
| 75° | 1435 | 598  | 555  |
| 80° | 1213 | 502  | 481  |
| 85° | 849  | 336  | 362  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 2043 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 306.8   | 1.9       |
| 10°-20°   | 842.2   | 5.2       |
| 20°-30°   | 1182.4  | 7.3       |
| 30°-40°   | 1288.9  | 8.0       |
| 40°-50°   | 1184.6  | 7.3       |
| 50°-60°   | 930.3   | 5.8       |
| 60°-70°   | 605.5   | 3.8       |
| 70°-80°   | 311.7   | 1.9       |
| 80°-90°   | 85.2    | 0.5       |
| 90°-100°  | 105.8   | 0.7       |
| 100°-110° | 394.3   | 2.4       |
| 110°-120° | 1045.7  | 6.5       |
| 120°-130° | 1734.3  | 10.7      |
| 130°-140° | 1842.3  | 11.4      |
| 140°-150° | 1712.2  | 10.6      |
| 150°-160° | 1376.5  | 8.5       |
| 160°-170° | 887.0   | 5.5       |
| 170°-180° | 305.3   | 1.9       |
| 0°-30°    | 2331.3  | 14.4      |
| 0°-40°    | 3620.2  | 22.4      |
| 0°-60°    | 5735.1  | 35.5      |
| 0°-90°    | 6737.6  | 41.7      |
| 90°-120°  | 1545.7  | 9.6       |
| 90°-150°  | 6834.5  | 42.3      |
| 90°-180°  | 9403.0  | 58.3      |
| 0°-180°   | 16140.9 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 3273 | 3273  | 3273 | 3273  | 3273 |      |
| 5°   | 3273 | 3258  | 3220 | 3247  | 3238 | 310  |
| 15°  | 3113 | 3081  | 2980 | 2924  | 2894 | 877  |
| 25°  | 2826 | 2731  | 2536 | 2414  | 2370 | 1300 |
| 35°  | 2435 | 2284  | 2023 | 1837  | 1771 | 1524 |
| 45°  | 1991 | 1792  | 1481 | 1271  | 1200 | 1537 |
| 55°  | 1514 | 1283  | 963  | 785   | 729  | 1353 |
| 65°  | 1022 | 782   | 515  | 415   | 406  | 1013 |
| 75°  | 545  | 338   | 237  | 216   | 213  | 576  |
| 85°  | 127  | 65    | 56   | 56    | 56   | 146  |
| 90°  | 2    | 28    | 46   | 58    | 63   | 15   |
| 95°  | 151  | 74    | 90   | 102   | 100  | 179  |
| 105° | 706  | 775   | 142  | 167   | 176  | 754  |
| 115° | 1334 | 1374  | 1432 | 357   | 190  | 1314 |
| 125° | 1887 | 1917  | 1961 | 1978  | 1984 | 1683 |
| 135° | 2335 | 2372  | 2393 | 2416  | 2412 | 1804 |
| 145° | 2709 | 2706  | 2746 | 2762  | 2750 | 1694 |
| 155° | 2982 | 2962  | 2990 | 3003  | 2985 | 1374 |
| 165° | 3142 | 3129  | 3136 | 3152  | 3136 | 888  |
| 175° | 3214 | 3198  | 3203 | 3219  | 3196 | 306  |
| 180° | 3208 | 3208  | 3208 | 3208  | 3208 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 3273.3 | 3273.3 | 3273.3 | 3273.3 | 3273.3 |
| 2.5°   | 3288.1 | 3273.3 | 3240.6 | 3270.5 | 3264.5 |
| 5°     | 3273.3 | 3258.5 | 3219.9 | 3246.6 | 3237.8 |
| 7.5°   | 3246.6 | 3229.0 | 3187.5 | 3199.1 | 3184.4 |
| 10°    | 3211.1 | 3190.3 | 3131.3 | 3122.1 | 3104.6 |
| 12.5°  | 3166.8 | 3140.0 | 3059.9 | 3042.3 | 3009.6 |
| 15°    | 3113.4 | 3080.6 | 2980.1 | 2923.8 | 2894.3 |
| 17.5°  | 3051.1 | 3003.7 | 2879.2 | 2814.1 | 2766.7 |
| 20°    | 2980.1 | 2920.7 | 2772.6 | 2698.8 | 2633.4 |
| 22.5°  | 2903.1 | 2834.9 | 2662.9 | 2562.4 | 2518.1 |
| 25°    | 2826.1 | 2731.2 | 2535.7 | 2414.3 | 2369.7 |
| 27.5°  | 2734.3 | 2633.4 | 2417.2 | 2278.0 | 2209.8 |
| 30°    | 2636.6 | 2523.7 | 2286.7 | 2135.9 | 2055.8 |
| 32.5°  | 2541.7 | 2405.2 | 2162.6 | 1984.8 | 1910.5 |
| 35°    | 2435.1 | 2284.0 | 2023.4 | 1836.7 | 1771.3 |
| 37.5°  | 2331.4 | 2168.3 | 1893.0 | 1688.4 | 1614.5 |
| 40°    | 2221.7 | 2044.2 | 1756.6 | 1546.3 | 1469.3 |
| 42.5°  | 2109.2 | 1919.6 | 1620.5 | 1401.1 | 1327.2 |
| 45°    | 1990.7 | 1792.1 | 1481.3 | 1270.7 | 1199.6 |
| 47.5°  | 1878.2 | 1668.0 | 1348.0 | 1137.4 | 1072.4 |
| 50°    | 1753.7 | 1543.4 | 1217.5 | 1013.0 | 951.0  |
| 52.5°  | 1632.1 | 1409.9 | 1093.1 | 897.6  | 841.3  |
| 55°    | 1513.6 | 1282.6 | 962.7  | 785.1  | 728.8  |
| 57.5°  | 1392.3 | 1155.3 | 847.4  | 681.4  | 633.9  |
| 60°    | 1267.8 | 1030.9 | 725.7  | 574.8  | 527.4  |
| 62.5°  | 1146.5 | 909.5  | 622.0  | 480.0  | 456.4  |
| 65°    | 1022.1 | 781.9  | 515.4  | 414.8  | 405.7  |
| 67.5°  | 903.6  | 663.5  | 414.8  | 364.2  | 355.4  |
| 70°    | 779.1  | 548.1  | 343.5  | 313.9  | 302.1  |
| 72.5°  | 660.6  | 441.2  | 287.3  | 263.7  | 257.7  |
| 75°    | 545.0  | 337.6  | 237.0  | 216.2  | 213.4  |
| 77.5°  | 429.7  | 239.8  | 186.7  | 174.7  | 168.8  |
| 80°    | 322.7  | 171.9  | 142.1  | 130.4  | 130.4  |
| 82.5°  | 225.0  | 115.6  | 97.7   | 91.8   | 91.8   |
| 85°    | 127.3  | 65.0   | 56.2   | 56.2   | 56.2   |
| 87.5°  | 47.4   | 23.6   | 23.6   | 20.8   | 20.8   |
| 90°    | 2.2    | 27.8   | 46.3   | 58.1   | 62.6   |
| 92.5°  | 58.1   | 48.8   | 55.7   | 60.4   | 62.6   |
| 95°    | 150.7  | 74.1   | 90.4   | 102.2  | 99.8   |
| 97.5°  | 271.5  | 81.3   | 118.2  | 125.4  | 127.6  |
| 100°   | 410.9  | 92.9   | 132.3  | 150.7  | 155.5  |
| 102.5° | 563.9  | 559.5  | 136.9  | 162.4  | 169.5  |
| 105°   | 705.5  | 775.3  | 141.7  | 167.0  | 176.4  |
| 107.5° | 870.3  | 928.2  | 146.4  | 171.7  | 181.1  |
| 110°   | 1028.3 | 1076.8 | 406.2  | 174.2  | 183.3  |



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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 1176.8 | 1218.4 | 1179.1 | 178.6  | 185.7  |
| 115°   | 1334.4 | 1373.9 | 1432.0 | 357.4  | 190.5  |
| 117.5° | 1471.5 | 1517.8 | 1557.5 | 1225.3 | 617.4  |
| 120°   | 1624.7 | 1659.4 | 1701.3 | 1729.2 | 1415.8 |
| 122.5° | 1754.5 | 1791.7 | 1838.3 | 1852.1 | 1854.5 |
| 125°   | 1886.8 | 1917.1 | 1961.2 | 1977.5 | 1984.4 |
| 127.5° | 2007.5 | 2040.0 | 2075.0 | 2098.2 | 2100.4 |
| 130°   | 2121.3 | 2158.5 | 2183.9 | 2209.5 | 2207.3 |
| 132.5° | 2237.3 | 2267.7 | 2293.0 | 2314.0 | 2311.8 |
| 135°   | 2334.9 | 2372.1 | 2392.8 | 2416.2 | 2411.6 |
| 137.5° | 2436.9 | 2464.7 | 2488.1 | 2511.3 | 2504.4 |
| 140°   | 2536.7 | 2555.4 | 2580.7 | 2601.7 | 2590.2 |
| 142.5° | 2620.4 | 2636.7 | 2666.7 | 2685.2 | 2673.6 |
| 145°   | 2708.6 | 2706.2 | 2745.5 | 2761.9 | 2750.2 |
| 147.5° | 2785.0 | 2778.1 | 2817.5 | 2829.1 | 2820.0 |
| 150°   | 2859.4 | 2843.1 | 2880.3 | 2894.1 | 2882.6 |
| 152.5° | 2921.9 | 2903.5 | 2938.2 | 2952.3 | 2936.0 |
| 155°   | 2982.3 | 2961.6 | 2989.5 | 3003.3 | 2984.8 |
| 157.5° | 3031.1 | 3012.6 | 3033.6 | 3049.8 | 3031.1 |
| 160°   | 3073.0 | 3058.9 | 3073.0 | 3086.7 | 3070.5 |
| 162.5° | 3109.9 | 3096.2 | 3107.7 | 3124.0 | 3103.1 |
| 165°   | 3142.4 | 3128.6 | 3135.5 | 3151.8 | 3135.5 |
| 167.5° | 3168.1 | 3154.0 | 3161.2 | 3177.4 | 3156.5 |
| 170°   | 3189.0 | 3175.0 | 3179.6 | 3195.9 | 3175.0 |
| 172.5° | 3202.8 | 3189.0 | 3193.7 | 3210.0 | 3189.0 |
| 175°   | 3214.3 | 3198.1 | 3202.8 | 3219.1 | 3195.9 |
| 177.5° | 3219.1 | 3202.8 | 3205.3 | 3221.5 | 3200.6 |
| 180°   | 3207.5 | 3207.5 | 3207.5 | 3207.5 | 3207.5 |

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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 | 9.42             | 10.18 | 10.45 | 11.22 | 12.60 | 5.39           | 6.16 | 6.42  | 7.19  | 8.58  |
|                 | 3H   | 11.09            | 11.77 | 12.13 | 12.82 | 14.22 | 6.57           | 7.26 | 7.62  | 8.30  | 9.71  |
|                 | 4H   | 11.70            | 12.34 | 12.75 | 13.39 | 14.80 | 7.02           | 7.67 | 8.08  | 8.72  | 10.13 |
|                 | 6H   | 12.11            | 12.71 | 13.18 | 13.76 | 15.19 | 7.34           | 7.94 | 8.40  | 8.99  | 10.41 |
|                 | 8H   | 12.24            | 12.81 | 13.31 | 13.87 | 15.29 | 7.43           | 8.00 | 8.50  | 9.07  | 10.49 |
|                 | 12H  | 12.30            | 12.84 | 13.37 | 13.90 | 15.34 | 7.47           | 8.01 | 8.55  | 9.07  | 10.52 |
| 4H              | 2H   | 9.43             | 10.08 | 10.49 | 11.12 | 12.53 | 5.98           | 6.63 | 7.04  | 7.67  | 9.09  |
|                 | 3H   | 11.25            | 11.79 | 12.32 | 12.86 | 14.29 | 7.32           | 7.86 | 8.39  | 8.94  | 10.36 |
|                 | 4H   | 11.94            | 12.44 | 13.01 | 13.50 | 14.95 | 7.87           | 8.36 | 8.94  | 9.43  | 10.88 |
|                 | 6H   | 12.45            | 12.88 | 13.54 | 13.97 | 15.41 | 8.29           | 8.71 | 9.37  | 9.80  | 11.24 |
|                 | 8H   | 12.63            | 13.02 | 13.71 | 14.10 | 15.56 | 8.42           | 8.81 | 9.50  | 9.89  | 11.35 |
|                 | 12H  | 12.72            | 13.08 | 13.82 | 14.17 | 15.64 | 8.48           | 8.84 | 9.58  | 9.93  | 11.39 |
| 8H              | 4H   | 11.91            | 12.30 | 12.99 | 13.38 | 14.84 | 8.15           | 8.54 | 9.23  | 9.62  | 11.08 |
|                 | 6H   | 12.47            | 12.80 | 13.57 | 13.92 | 15.37 | 8.66           | 8.99 | 9.77  | 10.11 | 11.57 |
|                 | 8H   | 12.69            | 12.97 | 13.80 | 14.08 | 15.55 | 8.86           | 9.14 | 9.97  | 10.25 | 11.72 |
|                 | 12H  | 12.82            | 13.08 | 13.94 | 14.17 | 15.69 | 8.97           | 9.23 | 10.09 | 10.33 | 11.84 |
| 12H             | 4H   | 11.85            | 12.21 | 12.95 | 13.31 | 14.77 | 8.15           | 8.51 | 9.25  | 9.60  | 11.06 |
|                 | 6H   | 12.45            | 12.73 | 13.56 | 13.84 | 15.31 | 8.71           | 9.00 | 9.82  | 10.10 | 11.58 |
|                 | 8H   | 12.66            | 12.92 | 13.78 | 14.02 | 15.53 | 8.92           | 9.18 | 10.04 | 10.27 | 11.79 |