

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: P917464

Luminaire Tested: DFN2DIP-SQ3F0-090D120US930-FLLFLL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P917464  
REPORT IS A COMBINATION OF REPORTS P900015 AND P896733  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-SQ3F0-090D120US930-FLLFLL  
Description: 3 foot, Square Define Geo, with Direct Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

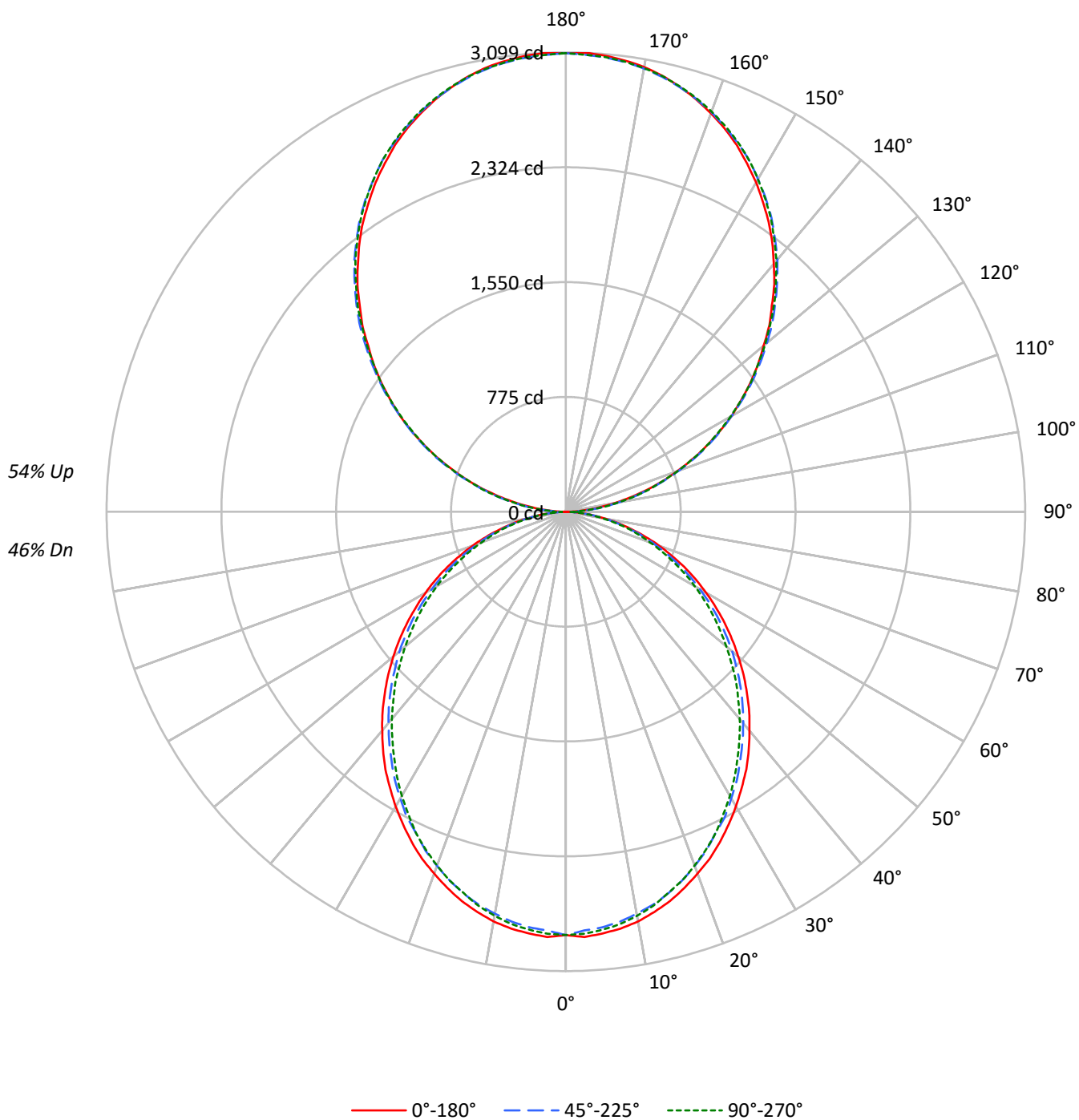
Lumens per Lamp: N/A  
Luminaire Lumens: 15922.8 lumens  
Efficiency: N/A  
Efficacy: 87.5 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 3.06' x L: 3.06' x H: 0.1')  
CIE Type: General Diffuse

Input Watts (W): 181.9  
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



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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   | 106 | 106 | 106 | 106 | 97 | 97 | 97 | 97 | 81 | 81 | 81 | 66 | 66 | 66 | 52 | 52 | 52 |
| 1   | 97  | 93  | 89  | 85  | 89 | 85 | 82 | 79 | 71 | 69 | 66 | 58 | 56 | 55 | 46 | 45 | 44 |
| 2   | 88  | 81  | 75  | 70  | 81 | 74 | 69 | 65 | 62 | 58 | 55 | 51 | 48 | 46 | 41 | 39 | 37 |
| 3   | 80  | 71  | 64  | 58  | 73 | 65 | 59 | 54 | 55 | 50 | 46 | 45 | 42 | 39 | 36 | 34 | 32 |
| 4   | 74  | 63  | 55  | 49  | 67 | 58 | 51 | 46 | 49 | 43 | 39 | 40 | 36 | 33 | 32 | 29 | 27 |
| 5   | 67  | 56  | 48  | 42  | 62 | 52 | 45 | 39 | 44 | 38 | 34 | 36 | 32 | 29 | 29 | 26 | 24 |
| 6   | 62  | 50  | 42  | 36  | 57 | 46 | 39 | 34 | 39 | 34 | 30 | 33 | 28 | 25 | 26 | 23 | 21 |
| 7   | 57  | 45  | 37  | 32  | 53 | 42 | 35 | 30 | 36 | 30 | 26 | 30 | 25 | 22 | 24 | 21 | 19 |
| 8   | 53  | 41  | 33  | 28  | 49 | 38 | 31 | 26 | 32 | 27 | 23 | 27 | 23 | 20 | 22 | 19 | 17 |
| 9   | 50  | 37  | 30  | 25  | 45 | 35 | 28 | 24 | 30 | 24 | 21 | 25 | 21 | 18 | 20 | 17 | 15 |
| 10  | 46  | 34  | 27  | 22  | 42 | 32 | 25 | 21 | 27 | 22 | 19 | 23 | 19 | 16 | 19 | 16 | 14 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 3271 | 3271 | 3271 |
| 5°  | 3275 | 3224 | 3246 |
| 10° | 3246 | 3178 | 3201 |
| 15° | 3196 | 3124 | 3132 |
| 20° | 3130 | 3049 | 3060 |
| 25° | 3063 | 2960 | 2978 |
| 30° | 2981 | 2876 | 2874 |
| 35° | 2902 | 2779 | 2763 |
| 40° | 2806 | 2680 | 2658 |
| 45° | 2710 | 2581 | 2551 |
| 50° | 2605 | 2477 | 2426 |
| 55° | 2495 | 2357 | 2311 |
| 60° | 2370 | 2214 | 2180 |
| 65° | 2233 | 2066 | 2025 |
| 70° | 2060 | 1885 | 1857 |
| 75° | 1820 | 1669 | 1701 |
| 80° | 1530 | 1392 | 1407 |
| 85° | 1076 | 923  | 920  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 90°

Vertical Angle: 90°

Luminance: 3112 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 268.7   | 1.7       |
| 10°-20°   | 756.1   | 4.7       |
| 20°-30°   | 1111.2  | 7.0       |
| 30°-40°   | 1290.5  | 8.1       |
| 40°-50°   | 1288.9  | 8.1       |
| 50°-60°   | 1123.9  | 7.1       |
| 60°-70°   | 830.8   | 5.2       |
| 70°-80°   | 470.1   | 3.0       |
| 80°-90°   | 132.8   | 0.8       |
| 90°-100°  | 191.5   | 1.2       |
| 100°-110° | 608.3   | 3.8       |
| 110°-120° | 1041.1  | 6.5       |
| 120°-130° | 1369.2  | 8.6       |
| 130°-140° | 1536.9  | 9.7       |
| 140°-150° | 1507.1  | 9.5       |
| 150°-160° | 1264.2  | 7.9       |
| 160°-170° | 838.4   | 5.3       |
| 170°-180° | 293.0   | 1.8       |
| 0°-30°    | 2136.0  | 13.4      |
| 0°-40°    | 3426.5  | 21.5      |
| 0°-60°    | 5839.4  | 36.7      |
| 0°-90°    | 7273.1  | 45.7      |
| 90°-120°  | 1840.9  | 11.6      |
| 90°-150°  | 6254.0  | 39.3      |
| 90°-180°  | 8650.0  | 54.3      |
| 0°-180°   | 15922.8 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 2855 | 2855  | 2855 | 2855  | 2855 |      |
| 5°   | 2855 | 2844  | 2814 | 2836  | 2831 | 271  |
| 15°  | 2718 | 2702  | 2666 | 2677  | 2663 | 765  |
| 25°  | 2460 | 2438  | 2391 | 2397  | 2391 | 1132 |
| 35°  | 2122 | 2095  | 2051 | 2034  | 2021 | 1325 |
| 45°  | 1727 | 1708  | 1666 | 1636  | 1625 | 1333 |
| 55°  | 1307 | 1290  | 1257 | 1225  | 1211 | 1169 |
| 65°  | 881  | 865   | 837  | 813   | 799  | 871  |
| 75°  | 461  | 456   | 442  | 426   | 431  | 492  |
| 85°  | 112  | 110   | 107  | 99    | 96   | 125  |
| 90°  | 3    | 34    | 91   | 86    | 89   | 15   |
| 95°  | 136  | 162   | 167  | 167   | 162  | 152  |
| 105° | 562  | 569   | 575  | 579   | 579  | 593  |
| 115° | 1045 | 1060  | 1055 | 1052  | 1045 | 1033 |
| 125° | 1520 | 1543  | 1536 | 1527  | 1524 | 1358 |
| 135° | 1965 | 1994  | 2000 | 1997  | 1990 | 1519 |
| 145° | 2386 | 2405  | 2420 | 2423  | 2412 | 1491 |
| 155° | 2728 | 2736  | 2744 | 2757  | 2749 | 1256 |
| 165° | 2968 | 2966  | 2966 | 2984  | 2971 | 837  |
| 175° | 3089 | 3081  | 3076 | 3094  | 3078 | 293  |
| 180° | 3094 | 3094  | 3094 | 3094  | 3094 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 2855.1 | 2855.1 | 2855.1 | 2855.1 | 2855.1 |
| 2.5°   | 2871.7 | 2858.0 | 2827.8 | 2855.1 | 2849.9 |
| 5°     | 2855.1 | 2844.3 | 2814.1 | 2835.9 | 2830.6 |
| 7.5°   | 2835.9 | 2819.6 | 2789.3 | 2811.5 | 2805.9 |
| 10°    | 2805.9 | 2786.7 | 2753.8 | 2775.6 | 2767.4 |
| 12.5°  | 2764.5 | 2748.2 | 2715.4 | 2729.0 | 2723.5 |
| 15°    | 2718.0 | 2701.7 | 2665.8 | 2676.9 | 2663.2 |
| 17.5°  | 2660.2 | 2643.9 | 2608.1 | 2621.8 | 2608.1 |
| 20°    | 2597.1 | 2580.7 | 2542.3 | 2550.4 | 2539.7 |
| 22.5°  | 2534.1 | 2509.4 | 2473.5 | 2473.5 | 2468.0 |
| 25°    | 2459.8 | 2438.0 | 2391.4 | 2396.7 | 2391.4 |
| 27.5°  | 2377.4 | 2358.2 | 2322.7 | 2314.6 | 2300.9 |
| 30°    | 2295.3 | 2273.1 | 2232.0 | 2223.9 | 2212.9 |
| 32.5°  | 2207.3 | 2191.0 | 2147.0 | 2130.5 | 2119.4 |
| 35°    | 2122.3 | 2094.9 | 2050.9 | 2034.3 | 2020.6 |
| 37.5°  | 2026.2 | 2001.4 | 1957.4 | 1938.2 | 1924.5 |
| 40°    | 1927.4 | 1905.3 | 1861.2 | 1836.8 | 1825.8 |
| 42.5°  | 1831.2 | 1809.1 | 1765.4 | 1737.8 | 1721.5 |
| 45°    | 1727.0 | 1707.8 | 1666.4 | 1636.4 | 1625.4 |
| 47.5°  | 1625.4 | 1606.1 | 1562.1 | 1531.9 | 1515.6 |
| 50°    | 1518.2 | 1504.5 | 1466.0 | 1427.6 | 1413.9 |
| 52.5°  | 1413.9 | 1394.6 | 1359.1 | 1328.9 | 1309.6 |
| 55°    | 1307.0 | 1290.4 | 1257.4 | 1224.6 | 1210.9 |
| 57.5°  | 1199.8 | 1186.1 | 1150.3 | 1117.4 | 1106.3 |
| 60°    | 1092.6 | 1081.8 | 1043.3 | 1013.1 | 1004.9 |
| 62.5°  | 988.3  | 969.1  | 941.7  | 914.4  | 903.3  |
| 65°    | 881.4  | 864.8  | 837.4  | 812.7  | 799.0  |
| 67.5°  | 771.6  | 757.7  | 733.1  | 714.0  | 702.9  |
| 70°    | 669.9  | 658.8  | 634.1  | 614.9  | 604.1  |
| 72.5°  | 565.7  | 554.6  | 540.9  | 521.7  | 513.6  |
| 75°    | 461.1  | 455.8  | 441.9  | 425.6  | 431.1  |
| 77.5°  | 367.9  | 356.9  | 351.3  | 343.2  | 335.0  |
| 80°    | 274.7  | 271.7  | 266.2  | 258.0  | 252.6  |
| 82.5°  | 186.7  | 186.7  | 184.1  | 173.0  | 173.0  |
| 85°    | 112.4  | 109.8  | 107.2  | 98.7   | 96.1   |
| 87.5°  | 49.5   | 43.9   | 38.5   | 30.3   | 27.4   |
| 90°    | 2.8    | 33.6   | 91.4   | 85.9   | 88.6   |
| 92.5°  | 57.8   | 78.4   | 81.1   | 84.0   | 84.0   |
| 95°    | 136.2  | 162.3  | 167.0  | 167.0  | 162.3  |
| 97.5°  | 226.7  | 250.9  | 261.2  | 261.2  | 261.2  |
| 100°   | 331.2  | 352.6  | 360.0  | 360.0  | 357.3  |
| 102.5° | 441.2  | 457.1  | 467.3  | 470.2  | 467.3  |
| 105°   | 561.6  | 569.0  | 574.6  | 579.3  | 579.3  |
| 107.5° | 680.9  | 692.2  | 692.2  | 694.0  | 680.9  |
| 110°   | 796.6  | 811.5  | 811.5  | 811.5  | 804.1  |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 921.6  | 937.5  | 934.7  | 927.2  | 921.6  |
| 115°   | 1044.7 | 1059.7 | 1055.0 | 1052.2 | 1044.7 |
| 117.5° | 1166.9 | 1187.5 | 1174.4 | 1166.9 | 1159.5 |
| 120°   | 1290.1 | 1310.6 | 1290.1 | 1290.1 | 1281.7 |
| 122.5° | 1402.1 | 1428.2 | 1415.1 | 1407.6 | 1402.1 |
| 125°   | 1519.6 | 1542.9 | 1535.5 | 1527.1 | 1524.2 |
| 127.5° | 1634.3 | 1663.2 | 1652.9 | 1641.8 | 1634.3 |
| 130°   | 1741.6 | 1775.1 | 1770.5 | 1764.9 | 1754.6 |
| 132.5° | 1861.9 | 1888.1 | 1889.9 | 1876.8 | 1869.4 |
| 135°   | 1965.4 | 1994.4 | 2000.0 | 1997.2 | 1989.7 |
| 137.5° | 2081.1 | 2104.4 | 2109.1 | 2107.2 | 2096.1 |
| 140°   | 2182.8 | 2206.1 | 2219.2 | 2219.2 | 2208.9 |
| 142.5° | 2287.3 | 2310.6 | 2318.1 | 2320.8 | 2310.6 |
| 145°   | 2386.1 | 2404.8 | 2419.7 | 2422.6 | 2412.3 |
| 147.5° | 2474.8 | 2498.1 | 2509.3 | 2514.0 | 2503.7 |
| 150°   | 2566.2 | 2582.0 | 2592.3 | 2600.7 | 2592.3 |
| 152.5° | 2647.4 | 2663.2 | 2676.3 | 2686.6 | 2676.3 |
| 155°   | 2728.5 | 2736.0 | 2744.4 | 2757.4 | 2749.0 |
| 157.5° | 2798.5 | 2804.1 | 2808.7 | 2827.4 | 2814.3 |
| 160°   | 2861.0 | 2866.6 | 2869.4 | 2885.3 | 2874.0 |
| 162.5° | 2918.8 | 2918.8 | 2921.6 | 2939.3 | 2926.3 |
| 165°   | 2968.3 | 2965.5 | 2965.5 | 2984.1 | 2971.0 |
| 167.5° | 3013.0 | 3004.6 | 3004.6 | 3023.3 | 3010.2 |
| 170°   | 3046.6 | 3039.1 | 3036.3 | 3055.0 | 3039.1 |
| 172.5° | 3069.9 | 3062.4 | 3059.7 | 3078.3 | 3062.4 |
| 175°   | 3088.6 | 3081.1 | 3075.5 | 3094.1 | 3078.3 |
| 177.5° | 3098.9 | 3091.4 | 3085.7 | 3101.6 | 3085.7 |
| 180°   | 3094.1 | 3094.1 | 3094.1 | 3094.1 | 3094.1 |

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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 | 10.94            | 11.76 | 11.93 | 12.77 | 14.10 | 10.50          | 11.32 | 11.49 | 12.33 | 13.66 |
|                 | 3H   | 12.59            | 13.33 | 13.60 | 14.35 | 15.70 | 12.10          | 12.84 | 13.11 | 13.86 | 15.21 |
|                 | 4H   | 13.18            | 13.88 | 14.19 | 14.89 | 16.25 | 12.68          | 13.38 | 13.70 | 14.40 | 15.76 |
|                 | 6H   | 13.57            | 14.22 | 14.60 | 15.24 | 16.61 | 13.07          | 13.72 | 14.10 | 14.74 | 16.11 |
|                 | 8H   | 13.67            | 14.29 | 14.71 | 15.32 | 16.69 | 13.17          | 13.78 | 14.20 | 14.82 | 16.19 |
|                 | 12H  | 13.72            | 14.30 | 14.76 | 15.33 | 16.73 | 13.21          | 13.79 | 14.25 | 14.82 | 16.22 |
| 4H              | 2H   | 11.39            | 12.09 | 12.42 | 13.11 | 14.47 | 11.04          | 11.74 | 12.06 | 12.76 | 14.12 |
|                 | 3H   | 13.25            | 13.83 | 14.28 | 14.88 | 16.25 | 12.84          | 13.43 | 13.87 | 14.47 | 15.85 |
|                 | 4H   | 13.96            | 14.49 | 15.00 | 15.53 | 16.93 | 13.54          | 14.07 | 14.57 | 15.11 | 16.50 |
|                 | 6H   | 14.47            | 14.93 | 15.52 | 15.99 | 17.38 | 14.04          | 14.50 | 15.08 | 15.56 | 16.95 |
|                 | 8H   | 14.61            | 15.04 | 15.66 | 16.10 | 17.50 | 14.18          | 14.61 | 15.23 | 15.66 | 17.07 |
|                 | 12H  | 14.68            | 15.07 | 15.75 | 16.14 | 17.55 | 14.23          | 14.62 | 15.30 | 15.69 | 17.10 |
| 8H              | 4H   | 14.15            | 14.58 | 15.20 | 15.63 | 17.04 | 13.77          | 14.20 | 14.82 | 15.25 | 16.66 |
|                 | 6H   | 14.77            | 15.13 | 15.85 | 16.22 | 17.63 | 14.39          | 14.74 | 15.46 | 15.84 | 17.24 |
|                 | 8H   | 14.99            | 15.30 | 16.07 | 16.38 | 17.80 | 14.60          | 14.91 | 15.68 | 15.99 | 17.41 |
|                 | 12H  | 15.12            | 15.39 | 16.20 | 16.46 | 17.93 | 14.70          | 14.98 | 15.79 | 16.05 | 17.52 |
| 12H             | 4H   | 14.13            | 14.52 | 15.20 | 15.59 | 17.00 | 13.76          | 14.15 | 14.83 | 15.22 | 16.63 |
|                 | 6H   | 14.80            | 15.11 | 15.88 | 16.19 | 17.62 | 14.43          | 14.74 | 15.51 | 15.82 | 17.24 |
|                 | 8H   | 15.04            | 15.31 | 16.12 | 16.38 | 17.85 | 14.66          | 14.93 | 15.74 | 16.00 | 17.47 |