

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: P914847

Luminaire Tested: DFN2DIP-SQ3F0-120D120US927-RLLONL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P914847  
REPORT IS A COMBINATION OF REPORTS P901542 AND P898289  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-SQ3F0-120D120US927-RLLONL  
Description: 3 foot, Square Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

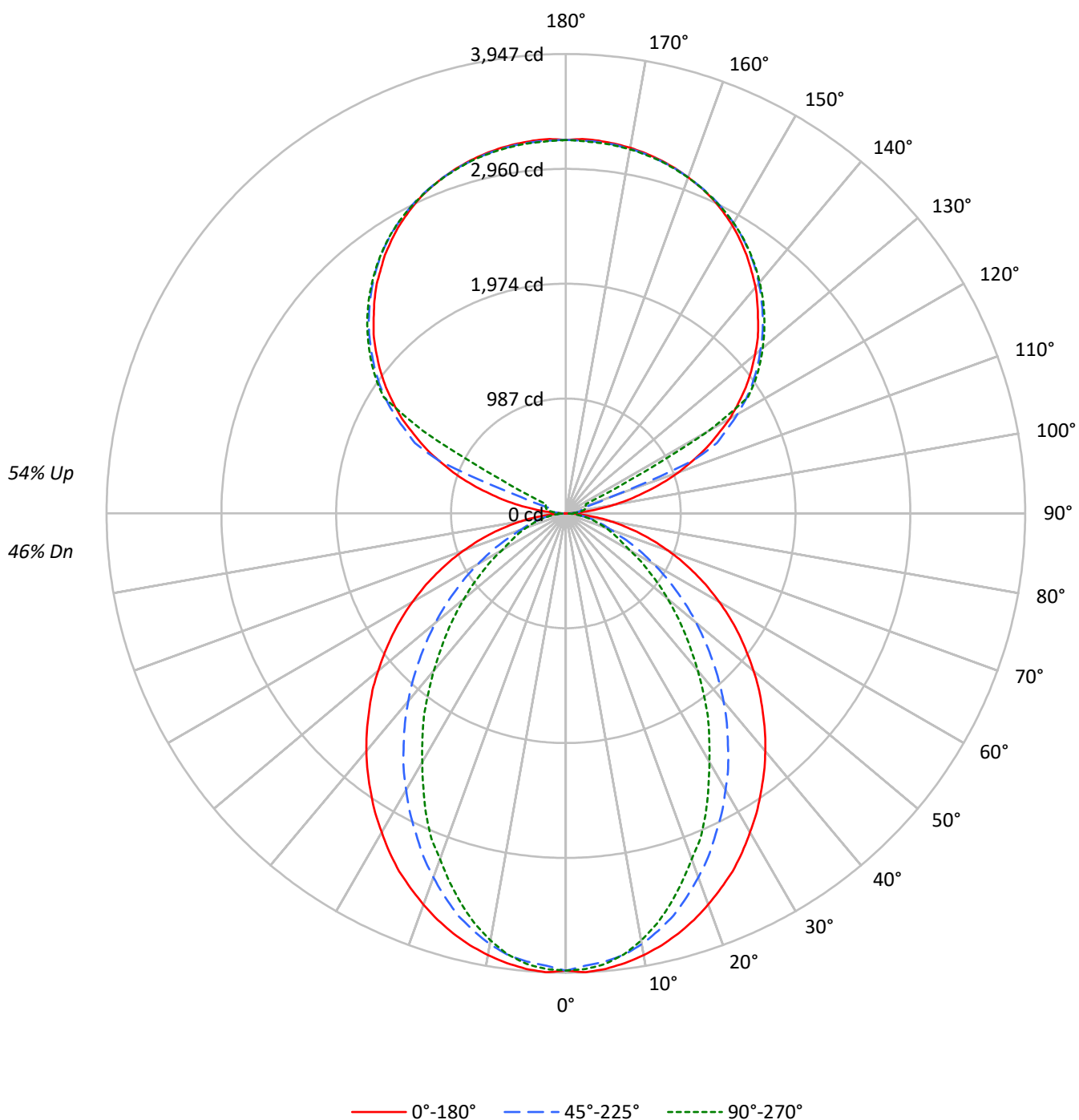
Lumens per Lamp: N/A  
Luminaire Lumens: 17491.4 lumens  
Efficiency: N/A  
Efficacy: 79.5 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 0.99 / 1.16  
Luminous Opening: Rectangular w/ Sides (W: 3.06' x L: 3.06' x H: 0.1')  
CIE Type: General Diffuse

Input Watts (W): 219.9  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9957  
Total Harmonic Distortion (THDi): 0.049  
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 | 98 | 98 | 98 | 98 | 81 | 81 | 81 | 66 | 66 | 66 | 53 | 53 | 53 |
| 1   | 97  | 93  | 90  | 86  | 89 | 86 | 83 | 80 | 72 | 70 | 68 | 59 | 58 | 56 | 47 | 46 | 45 |
| 2   | 89  | 82  | 76  | 71  | 82 | 76 | 70 | 66 | 63 | 60 | 57 | 52 | 50 | 48 | 42 | 40 | 39 |
| 3   | 81  | 72  | 65  | 60  | 75 | 67 | 61 | 56 | 56 | 52 | 48 | 47 | 43 | 41 | 38 | 35 | 34 |
| 4   | 75  | 64  | 57  | 51  | 68 | 60 | 53 | 48 | 50 | 45 | 41 | 42 | 38 | 35 | 34 | 31 | 29 |
| 5   | 69  | 58  | 50  | 44  | 63 | 53 | 46 | 41 | 45 | 40 | 36 | 38 | 34 | 31 | 31 | 28 | 26 |
| 6   | 63  | 52  | 44  | 38  | 58 | 48 | 41 | 36 | 41 | 36 | 32 | 34 | 30 | 27 | 28 | 25 | 23 |
| 7   | 59  | 47  | 39  | 34  | 54 | 44 | 37 | 32 | 37 | 32 | 28 | 31 | 27 | 24 | 26 | 23 | 21 |
| 8   | 55  | 43  | 35  | 30  | 50 | 40 | 33 | 28 | 34 | 29 | 25 | 29 | 25 | 22 | 24 | 21 | 19 |
| 9   | 51  | 39  | 32  | 27  | 47 | 36 | 30 | 25 | 31 | 26 | 22 | 27 | 23 | 20 | 22 | 19 | 17 |
| 10  | 48  | 36  | 29  | 24  | 44 | 33 | 27 | 23 | 29 | 24 | 20 | 25 | 21 | 18 | 20 | 18 | 15 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 4502 | 4502 | 4502 |
| 5°  | 4506 | 4427 | 4457 |
| 10° | 4459 | 4337 | 4311 |
| 15° | 4394 | 4191 | 4085 |
| 20° | 4310 | 3991 | 3809 |
| 25° | 4224 | 3767 | 3542 |
| 30° | 4110 | 3537 | 3204 |
| 35° | 3997 | 3291 | 2907 |
| 40° | 3882 | 3036 | 2568 |
| 45° | 3749 | 2754 | 2260 |
| 50° | 3612 | 2469 | 1959 |
| 55° | 3468 | 2166 | 1670 |
| 60° | 3301 | 1848 | 1373 |
| 65° | 3109 | 1526 | 1234 |
| 70° | 2875 | 1226 | 1115 |
| 75° | 2581 | 1074 | 1011 |
| 80° | 2158 | 892  | 871  |
| 85° | 1463 | 581  | 646  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 3749 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 368.2   | 2.1       |
| 10°-20°   | 1010.8  | 5.8       |
| 20°-30°   | 1419.2  | 8.1       |
| 30°-40°   | 1547.0  | 8.8       |
| 40°-50°   | 1421.9  | 8.1       |
| 50°-60°   | 1116.7  | 6.4       |
| 60°-70°   | 726.9   | 4.2       |
| 70°-80°   | 374.2   | 2.1       |
| 80°-90°   | 101.2   | 0.6       |
| 90°-100°  | 105.8   | 0.6       |
| 100°-110° | 394.4   | 2.3       |
| 110°-120° | 1045.9  | 6.0       |
| 120°-130° | 1734.7  | 9.9       |
| 130°-140° | 1842.7  | 10.5      |
| 140°-150° | 1712.6  | 9.8       |
| 150°-160° | 1376.9  | 7.9       |
| 160°-170° | 887.2   | 5.1       |
| 170°-180° | 305.4   | 1.7       |
| 0°-30°    | 2798.2  | 16.0      |
| 0°-40°    | 4345.2  | 24.8      |
| 0°-60°    | 6883.7  | 39.4      |
| 0°-90°    | 8085.9  | 46.2      |
| 90°-120°  | 1546.1  | 8.8       |
| 90°-150°  | 6836.0  | 39.1      |
| 90°-180°  | 9405.0  | 53.8      |
| 0°-180°   | 17491.4 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 3929 | 3929  | 3929 | 3929  | 3929 |      |
| 5°   | 3929 | 3911  | 3865 | 3897  | 3886 | 373  |
| 15°  | 3737 | 3698  | 3577 | 3509  | 3474 | 1053 |
| 25°  | 3392 | 3278  | 3044 | 2898  | 2844 | 1560 |
| 35°  | 2923 | 2741  | 2429 | 2205  | 2126 | 1829 |
| 45°  | 2389 | 2151  | 1778 | 1525  | 1440 | 1845 |
| 55°  | 1817 | 1540  | 1156 | 942   | 875  | 1623 |
| 65°  | 1227 | 939   | 619  | 498   | 487  | 1216 |
| 75°  | 654  | 405   | 284  | 260   | 256  | 692  |
| 85°  | 153  | 78    | 68   | 68    | 68   | 175  |
| 90°  | 2    | 28    | 46   | 58    | 63   | 16   |
| 95°  | 151  | 74    | 90   | 102   | 100  | 179  |
| 105° | 706  | 776   | 142  | 167   | 176  | 754  |
| 115° | 1335 | 1374  | 1432 | 358   | 190  | 1314 |
| 125° | 1887 | 1918  | 1962 | 1978  | 1985 | 1683 |
| 135° | 2335 | 2373  | 2393 | 2417  | 2412 | 1804 |
| 145° | 2709 | 2707  | 2746 | 2762  | 2751 | 1694 |
| 155° | 2983 | 2962  | 2990 | 3004  | 2986 | 1375 |
| 165° | 3143 | 3129  | 3136 | 3153  | 3136 | 888  |
| 175° | 3215 | 3199  | 3204 | 3220  | 3197 | 306  |
| 180° | 3208 | 3208  | 3208 | 3208  | 3208 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 3928.9 | 3928.9 | 3928.9 | 3928.9 | 3928.9 |
| 2.5°   | 3946.6 | 3928.9 | 3889.7 | 3925.5 | 3918.3 |
| 5°     | 3928.9 | 3911.2 | 3864.7 | 3896.8 | 3886.3 |
| 7.5°   | 3896.8 | 3875.7 | 3825.9 | 3839.9 | 3822.1 |
| 10°    | 3854.2 | 3829.3 | 3758.3 | 3747.4 | 3726.3 |
| 12.5°  | 3801.0 | 3769.0 | 3672.7 | 3651.6 | 3612.4 |
| 15°    | 3736.9 | 3697.7 | 3576.9 | 3509.4 | 3474.0 |
| 17.5°  | 3662.2 | 3605.2 | 3455.8 | 3377.8 | 3320.8 |
| 20°    | 3576.9 | 3505.6 | 3328.0 | 3239.3 | 3160.8 |
| 22.5°  | 3484.5 | 3402.7 | 3196.3 | 3075.6 | 3022.4 |
| 25°    | 3392.1 | 3278.1 | 3043.5 | 2897.9 | 2844.3 |
| 27.5°  | 3281.9 | 3160.8 | 2901.3 | 2734.2 | 2652.3 |
| 30°    | 3164.6 | 3029.2 | 2744.7 | 2563.7 | 2467.5 |
| 32.5°  | 3050.7 | 2886.9 | 2595.7 | 2382.2 | 2293.2 |
| 35°    | 2922.8 | 2741.3 | 2428.6 | 2204.6 | 2126.1 |
| 37.5°  | 2798.3 | 2602.6 | 2272.1 | 2026.5 | 1937.8 |
| 40°    | 2666.6 | 2453.5 | 2108.4 | 1856.0 | 1763.6 |
| 42.5°  | 2531.6 | 2304.1 | 1945.0 | 1681.7 | 1593.1 |
| 45°    | 2389.4 | 2151.0 | 1777.9 | 1525.2 | 1439.9 |
| 47.5°  | 2254.3 | 2002.0 | 1618.0 | 1365.2 | 1287.1 |
| 50°    | 2105.0 | 1852.6 | 1461.4 | 1215.8 | 1141.5 |
| 52.5°  | 1959.0 | 1692.3 | 1312.0 | 1077.4 | 1009.9 |
| 55°    | 1816.8 | 1539.5 | 1155.5 | 942.3  | 874.8  |
| 57.5°  | 1671.1 | 1386.7 | 1017.0 | 817.8  | 760.9  |
| 60°    | 1521.8 | 1237.3 | 871.0  | 690.0  | 633.0  |
| 62.5°  | 1376.2 | 1091.7 | 746.6  | 576.1  | 547.7  |
| 65°    | 1226.8 | 938.6  | 618.7  | 498.0  | 487.0  |
| 67.5°  | 1084.6 | 796.3  | 498.0  | 437.2  | 426.7  |
| 70°    | 935.2  | 657.9  | 412.3  | 376.8  | 362.5  |
| 72.5°  | 793.0  | 529.7  | 344.8  | 316.5  | 309.3  |
| 75°    | 654.1  | 405.1  | 284.5  | 259.5  | 256.1  |
| 77.5°  | 515.7  | 287.8  | 224.1  | 209.8  | 202.6  |
| 80°    | 387.5  | 206.4  | 170.5  | 156.5  | 156.5  |
| 82.5°  | 270.1  | 138.8  | 117.3  | 110.1  | 110.1  |
| 85°    | 152.8  | 78.1   | 67.5   | 67.5   | 67.5   |
| 87.5°  | 57.0   | 28.3   | 28.3   | 24.9   | 24.9   |
| 90°    | 2.2    | 27.8   | 46.3   | 58.1   | 62.6   |
| 92.5°  | 58.1   | 48.8   | 55.7   | 60.4   | 62.6   |
| 95°    | 150.8  | 74.1   | 90.4   | 102.3  | 99.8   |
| 97.5°  | 271.6  | 81.4   | 118.3  | 125.4  | 127.6  |
| 100°   | 411.0  | 92.9   | 132.3  | 150.8  | 155.5  |
| 102.5° | 564.0  | 559.6  | 137.0  | 162.4  | 169.5  |
| 105°   | 705.7  | 775.5  | 141.7  | 167.1  | 176.4  |
| 107.5° | 870.5  | 928.4  | 146.4  | 171.7  | 181.1  |
| 110°   | 1028.5 | 1077.0 | 406.3  | 174.2  | 183.3  |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 1177.1 | 1218.7 | 1179.3 | 178.6  | 185.8  |
| 115°   | 1334.7 | 1374.2 | 1432.3 | 357.5  | 190.5  |
| 117.5° | 1471.8 | 1518.1 | 1557.8 | 1225.6 | 617.5  |
| 120°   | 1625.1 | 1659.8 | 1701.7 | 1729.6 | 1416.1 |
| 122.5° | 1754.9 | 1792.2 | 1838.7 | 1852.5 | 1855.0 |
| 125°   | 1887.2 | 1917.6 | 1961.7 | 1977.9 | 1984.8 |
| 127.5° | 2007.9 | 2040.5 | 2075.5 | 2098.6 | 2100.9 |
| 130°   | 2121.8 | 2159.0 | 2184.4 | 2210.0 | 2207.8 |
| 132.5° | 2237.8 | 2268.2 | 2293.5 | 2314.5 | 2312.3 |
| 135°   | 2335.4 | 2372.7 | 2393.3 | 2416.8 | 2412.1 |
| 137.5° | 2437.5 | 2465.3 | 2488.7 | 2511.8 | 2505.0 |
| 140°   | 2537.3 | 2556.0 | 2581.3 | 2602.3 | 2590.7 |
| 142.5° | 2621.0 | 2637.3 | 2667.4 | 2685.8 | 2674.2 |
| 145°   | 2709.3 | 2706.8 | 2746.2 | 2762.5 | 2750.8 |
| 147.5° | 2785.6 | 2778.7 | 2818.2 | 2829.8 | 2820.6 |
| 150°   | 2860.0 | 2843.8 | 2881.0 | 2894.8 | 2883.2 |
| 152.5° | 2922.6 | 2904.1 | 2938.9 | 2952.9 | 2936.7 |
| 155°   | 2983.0 | 2962.3 | 2990.2 | 3004.0 | 2985.5 |
| 157.5° | 3031.8 | 3013.3 | 3034.3 | 3050.5 | 3031.8 |
| 160°   | 3073.7 | 3059.6 | 3073.7 | 3087.4 | 3071.2 |
| 162.5° | 3110.7 | 3096.9 | 3108.4 | 3124.7 | 3103.8 |
| 165°   | 3143.1 | 3129.4 | 3136.2 | 3152.6 | 3136.2 |
| 167.5° | 3168.8 | 3154.7 | 3161.9 | 3178.2 | 3157.2 |
| 170°   | 3189.7 | 3175.7 | 3180.4 | 3196.6 | 3175.7 |
| 172.5° | 3203.5 | 3189.7 | 3194.5 | 3210.7 | 3189.7 |
| 175°   | 3215.1 | 3198.8 | 3203.5 | 3219.8 | 3196.6 |
| 177.5° | 3219.8 | 3203.5 | 3206.0 | 3222.3 | 3201.4 |
| 180°   | 3208.3 | 3208.3 | 3208.3 | 3208.3 | 3208.3 |

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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 | 11.98            | 12.78 | 12.97 | 13.78 | 15.11 | 7.94           | 8.74  | 8.93  | 9.74  | 11.07 |
|                 | 3H   | 13.65            | 14.36 | 14.65 | 15.37 | 16.72 | 9.12           | 9.83  | 10.12 | 10.84 | 12.19 |
|                 | 4H   | 14.25            | 14.93 | 15.27 | 15.94 | 17.30 | 9.56           | 10.24 | 10.58 | 11.25 | 12.61 |
|                 | 6H   | 14.67            | 15.29 | 15.70 | 16.31 | 17.68 | 9.88           | 10.50 | 10.90 | 11.52 | 12.89 |
|                 | 8H   | 14.79            | 15.38 | 15.83 | 16.42 | 17.78 | 9.96           | 10.55 | 11.00 | 11.59 | 12.95 |
|                 | 12H  | 14.85            | 15.41 | 15.89 | 16.44 | 17.83 | 10.00          | 10.56 | 11.04 | 11.59 | 12.98 |
| 4H              | 2H   | 11.99            | 12.67 | 13.01 | 13.68 | 15.04 | 8.53           | 9.20  | 9.55  | 10.22 | 11.57 |
|                 | 3H   | 13.81            | 14.37 | 14.84 | 15.42 | 16.79 | 9.87           | 10.43 | 10.90 | 11.47 | 12.84 |
|                 | 4H   | 14.50            | 15.01 | 15.54 | 16.05 | 17.44 | 10.41          | 10.92 | 11.45 | 11.96 | 13.35 |
|                 | 6H   | 15.01            | 15.45 | 16.06 | 16.51 | 17.89 | 10.82          | 11.26 | 11.87 | 12.32 | 13.71 |
|                 | 8H   | 15.18            | 15.59 | 16.23 | 16.64 | 18.04 | 10.94          | 11.36 | 11.99 | 12.41 | 13.81 |
|                 | 12H  | 15.27            | 15.64 | 16.34 | 16.71 | 18.12 | 11.00          | 11.38 | 12.07 | 12.44 | 13.85 |
| 8H              | 4H   | 14.46            | 14.87 | 15.51 | 15.93 | 17.33 | 10.68          | 11.10 | 11.73 | 12.15 | 13.55 |
|                 | 6H   | 15.02            | 15.36 | 16.10 | 16.46 | 17.85 | 11.19          | 11.53 | 12.27 | 12.63 | 14.03 |
|                 | 8H   | 15.24            | 15.53 | 16.32 | 16.61 | 18.03 | 11.38          | 11.68 | 12.46 | 12.75 | 14.17 |
|                 | 12H  | 15.37            | 15.63 | 16.45 | 16.70 | 18.16 | 11.49          | 11.75 | 12.57 | 12.82 | 14.29 |
| 12H             | 4H   | 14.41            | 14.78 | 15.48 | 15.85 | 17.26 | 10.69          | 11.06 | 11.75 | 12.12 | 13.53 |
|                 | 6H   | 15.00            | 15.30 | 16.08 | 16.37 | 17.79 | 11.24          | 11.54 | 12.32 | 12.62 | 14.03 |
|                 | 8H   | 15.21            | 15.48 | 16.30 | 16.55 | 18.01 | 11.44          | 11.71 | 12.53 | 12.78 | 14.24 |