

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: P912347

Luminaire Tested: DFN2DIP-SQ4F0-120D080US850-RLLONL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P912347  
REPORT IS A COMBINATION OF REPORTS P901628 AND P898471  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-SQ4F0-120D080US850-RLLONL  
Description: 4 foot, Square Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

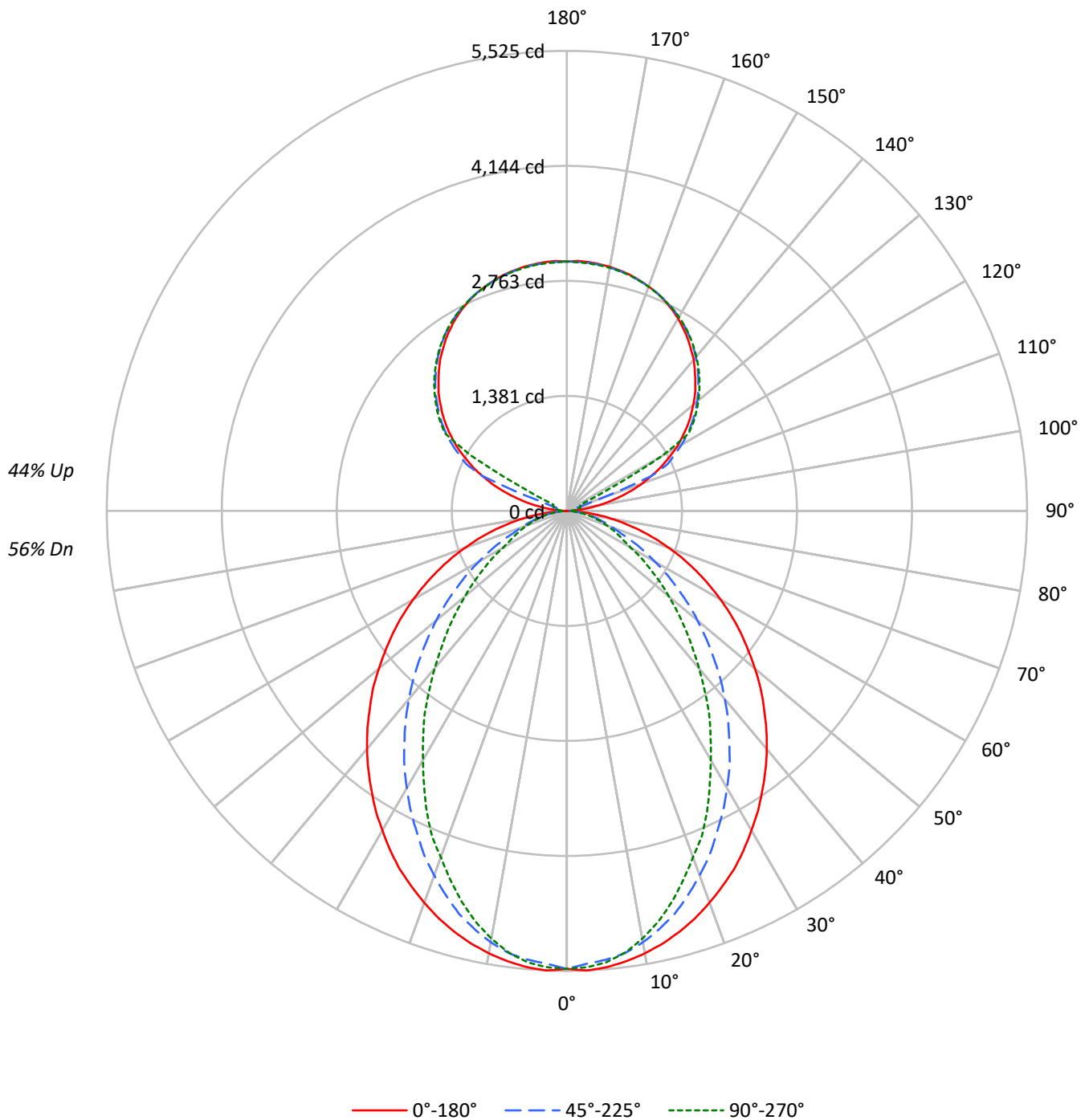
Lumens per Lamp: N/A  
Luminaire Lumens: 20095.1 lumens  
Efficiency: N/A  
Efficacy: 113.5 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 0.99 / 1.16  
Luminous Opening: Rectangular w/ Sides (W: 3.92' x L: 3.92' x H: 0.1')  
CIE Type: General Diffuse

Input Watts (W): 177.1  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9933  
Total Harmonic Distortion (THDi): 0.066  
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   | 109 | 109 | 109 | 109 |  | 101 | 101 | 101 | 101 |  | 87 | 87 | 87 |  | 74 | 74 | 74 |  | 62 | 62 | 62 |
| 1   | 100 | 96  | 92  | 88  |  | 93  | 89  | 86  | 83  |  | 77 | 75 | 72 |  | 66 | 64 | 63 |  | 56 | 54 | 53 |
| 2   | 91  | 84  | 78  | 73  |  | 85  | 79  | 73  | 69  |  | 68 | 64 | 61 |  | 58 | 56 | 53 |  | 50 | 48 | 46 |
| 3   | 84  | 74  | 67  | 62  |  | 78  | 70  | 63  | 58  |  | 61 | 56 | 52 |  | 52 | 49 | 46 |  | 44 | 42 | 40 |
| 4   | 77  | 66  | 59  | 53  |  | 71  | 62  | 55  | 50  |  | 54 | 49 | 45 |  | 47 | 43 | 40 |  | 40 | 37 | 35 |
| 5   | 71  | 59  | 51  | 46  |  | 66  | 56  | 49  | 43  |  | 49 | 43 | 39 |  | 42 | 38 | 35 |  | 36 | 33 | 31 |
| 6   | 65  | 54  | 46  | 40  |  | 61  | 50  | 43  | 38  |  | 44 | 39 | 34 |  | 39 | 34 | 31 |  | 33 | 30 | 27 |
| 7   | 61  | 49  | 41  | 35  |  | 56  | 46  | 39  | 34  |  | 40 | 35 | 30 |  | 35 | 31 | 27 |  | 30 | 27 | 24 |
| 8   | 56  | 44  | 37  | 31  |  | 52  | 42  | 35  | 30  |  | 37 | 31 | 27 |  | 32 | 28 | 25 |  | 28 | 25 | 22 |
| 9   | 53  | 41  | 33  | 28  |  | 49  | 38  | 32  | 27  |  | 34 | 28 | 25 |  | 30 | 25 | 22 |  | 26 | 23 | 20 |
| 10  | 49  | 37  | 30  | 25  |  | 46  | 35  | 29  | 24  |  | 31 | 26 | 22 |  | 28 | 23 | 20 |  | 24 | 21 | 18 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 3859 | 3859 | 3859 |
| 5°  | 3865 | 3799 | 3824 |
| 10° | 3827 | 3725 | 3700 |
| 15° | 3774 | 3603 | 3509 |
| 20° | 3705 | 3434 | 3274 |
| 25° | 3633 | 3244 | 3047 |
| 30° | 3537 | 3050 | 2758 |
| 35° | 3443 | 2841 | 2505 |
| 40° | 3348 | 2624 | 2214 |
| 45° | 3237 | 2384 | 1950 |
| 50° | 3122 | 2141 | 1693 |
| 55° | 3002 | 1882 | 1446 |
| 60° | 2863 | 1610 | 1191 |
| 65° | 2703 | 1335 | 1073 |
| 70° | 2510 | 1077 | 973  |
| 75° | 2267 | 951  | 887  |
| 80° | 1915 | 801  | 773  |
| 85° | 1333 | 539  | 589  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 3237 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 515.5   | 2.6       |
| 10°-20°   | 1415.1  | 7.0       |
| 20°-30°   | 1986.8  | 9.9       |
| 30°-40°   | 2165.7  | 10.8      |
| 40°-50°   | 1990.5  | 9.9       |
| 50°-60°   | 1563.2  | 7.8       |
| 60°-70°   | 1017.5  | 5.1       |
| 70°-80°   | 523.8   | 2.6       |
| 80°-90°   | 139.0   | 0.7       |
| 90°-100°  | 98.7    | 0.5       |
| 100°-110° | 368.1   | 1.8       |
| 110°-120° | 976.2   | 4.9       |
| 120°-130° | 1619.0  | 8.1       |
| 130°-140° | 1719.8  | 8.6       |
| 140°-150° | 1598.3  | 8.0       |
| 150°-160° | 1285.0  | 6.4       |
| 160°-170° | 828.0   | 4.1       |
| 170°-180° | 285.0   | 1.4       |
| 0°-30°    | 3917.3  | 19.5      |
| 0°-40°    | 6083.0  | 30.3      |
| 0°-60°    | 9636.8  | 48.0      |
| 0°-90°    | 11317.0 | 56.3      |
| 90°-120°  | 1442.9  | 7.2       |
| 90°-150°  | 6380.0  | 31.7      |
| 90°-180°  | 8778.0  | 43.7      |
| 0°-180°   | 20095.1 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 5500 | 5500  | 5500 | 5500  | 5500 |      |
| 5°   | 5500 | 5475  | 5410 | 5455  | 5440 | 522  |
| 15°  | 5231 | 5176  | 5008 | 4913  | 4863 | 1474 |
| 25°  | 4749 | 4589  | 4261 | 4057  | 3982 | 2184 |
| 35°  | 4092 | 3838  | 3400 | 3086  | 2976 | 2561 |
| 45°  | 3345 | 3011  | 2489 | 2135  | 2016 | 2583 |
| 55°  | 2543 | 2155  | 1618 | 1319  | 1225 | 2273 |
| 65°  | 1717 | 1314  | 866  | 697   | 682  | 1703 |
| 75°  | 916  | 567   | 398  | 363   | 358  | 969  |
| 85°  | 214  | 109   | 94   | 94    | 94   | 246  |
| 90°  | 2    | 26    | 43   | 54    | 58   | 19   |
| 95°  | 141  | 69    | 84   | 96    | 93   | 167  |
| 105° | 659  | 724   | 132  | 156   | 165  | 704  |
| 115° | 1246 | 1283  | 1337 | 334   | 178  | 1226 |
| 125° | 1761 | 1790  | 1831 | 1846  | 1852 | 1571 |
| 135° | 2180 | 2214  | 2234 | 2256  | 2251 | 1684 |
| 145° | 2528 | 2526  | 2563 | 2578  | 2567 | 1581 |
| 155° | 2784 | 2765  | 2791 | 2804  | 2786 | 1283 |
| 165° | 2934 | 2921  | 2927 | 2942  | 2927 | 829  |
| 175° | 3001 | 2985  | 2990 | 3005  | 2983 | 286  |
| 180° | 2994 | 2994  | 2994 | 2994  | 2994 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 5500.2 | 5500.2 | 5500.2 | 5500.2 | 5500.2 |
| 2.5°   | 5525.0 | 5500.2 | 5445.3 | 5495.4 | 5485.3 |
| 5°     | 5500.2 | 5475.4 | 5410.4 | 5455.3 | 5440.5 |
| 7.5°   | 5455.3 | 5425.7 | 5356.0 | 5375.5 | 5350.7 |
| 10°    | 5395.6 | 5360.8 | 5261.4 | 5246.1 | 5216.6 |
| 12.5°  | 5321.1 | 5276.3 | 5141.5 | 5112.0 | 5057.2 |
| 15°    | 5231.4 | 5176.5 | 5007.5 | 4912.9 | 4863.3 |
| 17.5°  | 5126.8 | 5047.1 | 4837.9 | 4728.7 | 4648.9 |
| 20°    | 5007.5 | 4907.7 | 4658.9 | 4534.8 | 4424.9 |
| 22.5°  | 4878.0 | 4763.5 | 4474.6 | 4305.6 | 4231.2 |
| 25°    | 4748.7 | 4589.2 | 4260.7 | 4056.8 | 3981.9 |
| 27.5°  | 4594.5 | 4424.9 | 4061.6 | 3827.7 | 3713.0 |
| 30°    | 4430.2 | 4240.7 | 3842.5 | 3588.9 | 3454.3 |
| 32.5°  | 4270.8 | 4041.5 | 3633.9 | 3335.0 | 3210.3 |
| 35°    | 4091.8 | 3837.7 | 3399.9 | 3086.2 | 2976.3 |
| 37.5°  | 3917.4 | 3643.4 | 3180.7 | 2836.9 | 2712.8 |
| 40°    | 3733.1 | 3434.8 | 2951.6 | 2598.3 | 2468.9 |
| 42.5°  | 3544.0 | 3225.6 | 2722.9 | 2354.3 | 2230.2 |
| 45°    | 3345.0 | 3011.3 | 2488.9 | 2135.2 | 2015.7 |
| 47.5°  | 3155.9 | 2802.7 | 2265.0 | 1911.3 | 1801.9 |
| 50°    | 2946.8 | 2593.5 | 2045.9 | 1702.1 | 1598.1 |
| 52.5°  | 2742.4 | 2369.0 | 1836.7 | 1508.2 | 1413.8 |
| 55°    | 2543.4 | 2155.2 | 1617.6 | 1319.2 | 1224.7 |
| 57.5°  | 2339.4 | 1941.3 | 1423.7 | 1144.9 | 1065.2 |
| 60°    | 2130.4 | 1732.1 | 1219.3 | 965.9  | 886.2  |
| 62.5°  | 1926.6 | 1528.3 | 1045.1 | 806.5  | 766.8  |
| 65°    | 1717.4 | 1313.9 | 866.1  | 697.1  | 681.8  |
| 67.5°  | 1518.3 | 1114.8 | 697.1  | 612.1  | 597.3  |
| 70°    | 1309.2 | 921.0  | 577.2  | 527.6  | 507.5  |
| 72.5°  | 1110.1 | 741.5  | 482.6  | 443.0  | 433.1  |
| 75°    | 915.7  | 567.1  | 398.2  | 363.3  | 358.5  |
| 77.5°  | 722.0  | 402.9  | 313.7  | 293.7  | 283.6  |
| 80°    | 542.4  | 288.9  | 238.7  | 219.1  | 219.1  |
| 82.5°  | 378.2  | 194.3  | 164.2  | 154.2  | 154.2  |
| 85°    | 213.9  | 109.3  | 94.5   | 94.5   | 94.5   |
| 87.5°  | 79.7   | 39.6   | 39.6   | 34.8   | 34.8   |
| 90°    | 2.1    | 26.0   | 43.3   | 54.2   | 58.4   |
| 92.5°  | 54.2   | 45.6   | 52.0   | 56.3   | 58.4   |
| 95°    | 140.7  | 69.2   | 84.4   | 95.5   | 93.2   |
| 97.5°  | 253.4  | 75.9   | 110.3  | 117.1  | 119.1  |
| 100°   | 383.6  | 86.7   | 123.5  | 140.7  | 145.1  |
| 102.5° | 526.4  | 522.2  | 127.9  | 151.5  | 158.3  |
| 105°   | 658.6  | 723.7  | 132.2  | 155.9  | 164.7  |
| 107.5° | 812.5  | 866.5  | 136.6  | 160.3  | 169.0  |
| 110°   | 960.0  | 1005.2 | 379.3  | 162.6  | 171.1  |



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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 1098.6 | 1137.4 | 1100.7 | 166.7  | 173.4  |
| 115°   | 1245.7 | 1282.6 | 1336.8 | 333.7  | 177.8  |
| 117.5° | 1373.6 | 1416.9 | 1453.9 | 1143.8 | 576.3  |
| 120°   | 1516.7 | 1549.1 | 1588.2 | 1614.1 | 1321.6 |
| 122.5° | 1637.8 | 1672.6 | 1716.1 | 1728.9 | 1731.3 |
| 125°   | 1761.3 | 1789.6 | 1830.7 | 1845.9 | 1852.4 |
| 127.5° | 1874.0 | 1904.4 | 1937.1 | 1958.6 | 1960.7 |
| 130°   | 1980.2 | 2014.9 | 2038.7 | 2062.6 | 2060.5 |
| 132.5° | 2088.6 | 2116.9 | 2140.6 | 2160.1 | 2158.0 |
| 135°   | 2179.6 | 2214.3 | 2233.6 | 2255.6 | 2251.2 |
| 137.5° | 2274.9 | 2300.8 | 2322.7 | 2344.3 | 2337.9 |
| 140°   | 2367.9 | 2385.5 | 2409.2 | 2428.7 | 2417.8 |
| 142.5° | 2446.2 | 2461.3 | 2489.4 | 2506.7 | 2495.8 |
| 145°   | 2528.5 | 2526.2 | 2563.0 | 2578.2 | 2567.3 |
| 147.5° | 2599.8 | 2593.4 | 2630.1 | 2641.0 | 2632.4 |
| 150°   | 2669.3 | 2654.1 | 2688.8 | 2701.6 | 2690.9 |
| 152.5° | 2727.7 | 2710.4 | 2742.8 | 2756.0 | 2740.8 |
| 155°   | 2784.0 | 2764.7 | 2790.7 | 2803.6 | 2786.4 |
| 157.5° | 2829.5 | 2812.3 | 2831.8 | 2847.0 | 2829.5 |
| 160°   | 2868.7 | 2855.6 | 2868.7 | 2881.5 | 2866.3 |
| 162.5° | 2903.1 | 2890.3 | 2901.0 | 2916.2 | 2896.7 |
| 165°   | 2933.5 | 2920.7 | 2927.1 | 2942.2 | 2927.1 |
| 167.5° | 2957.4 | 2944.3 | 2950.9 | 2966.1 | 2946.6 |
| 170°   | 2977.0 | 2963.8 | 2968.2 | 2983.4 | 2963.8 |
| 172.5° | 2989.9 | 2977.0 | 2981.3 | 2996.5 | 2977.0 |
| 175°   | 3000.6 | 2985.4 | 2989.9 | 3004.9 | 2983.4 |
| 177.5° | 3004.9 | 2989.9 | 2992.1 | 3007.3 | 2987.8 |
| 180°   | 2994.2 | 2994.2 | 2994.2 | 2994.2 | 2994.2 |

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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 | 12.42            | 13.31 | 13.33 | 14.23 | 15.41 | 8.38           | 9.27  | 9.29  | 10.19 | 11.37 |
|                 | 3H   | 14.11            | 14.90 | 15.03 | 15.83 | 17.04 | 9.58           | 10.37 | 10.50 | 11.30 | 12.50 |
|                 | 4H   | 14.72            | 15.47 | 15.66 | 16.41 | 17.62 | 10.03          | 10.78 | 10.96 | 11.71 | 12.93 |
|                 | 6H   | 15.15            | 15.84 | 16.10 | 16.78 | 18.01 | 10.35          | 11.04 | 11.30 | 11.98 | 13.21 |
|                 | 8H   | 15.28            | 15.93 | 16.23 | 16.89 | 18.12 | 10.45          | 11.10 | 11.40 | 12.06 | 13.29 |
|                 | 12H  | 15.35            | 15.97 | 16.30 | 16.92 | 18.17 | 10.49          | 11.11 | 11.45 | 12.07 | 13.32 |
| 4H              | 2H   | 12.45            | 13.19 | 13.39 | 14.13 | 15.35 | 8.99           | 9.73  | 9.93  | 10.67 | 11.89 |
|                 | 3H   | 14.29            | 14.91 | 15.24 | 15.87 | 17.10 | 10.34          | 10.96 | 11.29 | 11.93 | 13.16 |
|                 | 4H   | 14.98            | 15.55 | 15.94 | 16.51 | 17.77 | 10.89          | 11.46 | 11.85 | 12.42 | 13.68 |
|                 | 6H   | 15.51            | 15.99 | 16.48 | 16.98 | 18.23 | 11.32          | 11.80 | 12.29 | 12.79 | 14.04 |
|                 | 8H   | 15.69            | 16.14 | 16.66 | 17.12 | 18.39 | 11.45          | 11.90 | 12.42 | 12.88 | 14.15 |
|                 | 12H  | 15.79            | 16.19 | 16.78 | 17.19 | 18.46 | 11.52          | 11.93 | 12.51 | 12.92 | 14.19 |
| 8H              | 4H   | 14.96            | 15.41 | 15.93 | 16.39 | 17.66 | 11.18          | 11.64 | 12.16 | 12.61 | 13.88 |
|                 | 6H   | 15.53            | 15.90 | 16.53 | 16.92 | 18.19 | 11.70          | 12.08 | 12.70 | 13.10 | 14.36 |
|                 | 8H   | 15.75            | 16.08 | 16.76 | 17.09 | 18.37 | 11.89          | 12.23 | 12.90 | 13.23 | 14.52 |
|                 | 12H  | 15.89            | 16.18 | 16.90 | 17.19 | 18.52 | 12.02          | 12.31 | 13.03 | 13.31 | 14.64 |
| 12H             | 4H   | 14.91            | 15.32 | 15.90 | 16.32 | 17.59 | 11.19          | 11.60 | 12.18 | 12.59 | 13.87 |
|                 | 6H   | 15.50            | 15.84 | 16.51 | 16.84 | 18.13 | 11.75          | 12.08 | 12.76 | 13.09 | 14.38 |
|                 | 8H   | 15.73            | 16.02 | 16.74 | 17.02 | 18.35 | 11.97          | 12.26 | 12.98 | 13.26 | 14.59 |