

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: P911630

Luminaire Tested: DFN2DIP-PN4F0-120D070US850-RLLFLL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P911630  
REPORT IS A COMBINATION OF REPORTS P899680 AND P896497  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-PN4F0-120D070US850-RLLFLL  
Description: 4 foot, Pentagon Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

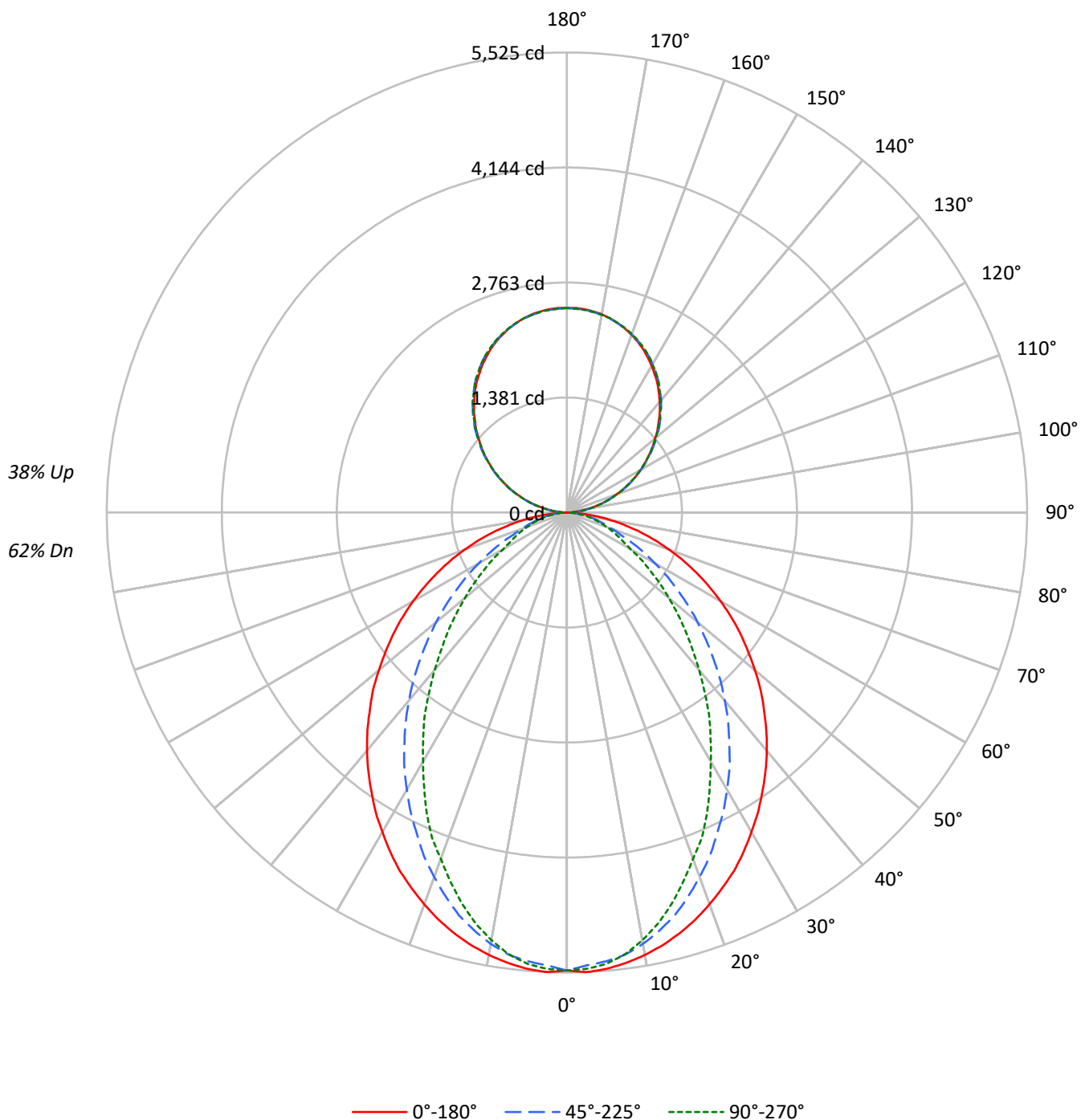
**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 18182.1 lumens  
Efficiency: N/A  
Efficacy: 101.7 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 0.99 / 1.16  
Luminous Opening: Rectangular w/ Sides (W: 3.74' x L: 3.94' x H: 0.1')  
CIE Type: Semi-Direct  
  
Input Watts (W): 178.8  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9781  
Total Harmonic Distortion (THDi): 0.075  
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   | 110 | 110 | 110 | 110 | 103 | 103 | 103 | 103 | 90 | 90 | 90 | 78 | 78 | 78 | 67 | 67 | 67 |
| 1   | 101 | 97  | 93  | 90  | 95  | 91  | 88  | 85  | 80 | 78 | 75 | 70 | 68 | 66 | 60 | 59 | 58 |
| 2   | 93  | 85  | 79  | 74  | 87  | 80  | 75  | 71  | 71 | 67 | 63 | 62 | 59 | 56 | 54 | 52 | 50 |
| 3   | 85  | 76  | 68  | 63  | 79  | 71  | 65  | 60  | 63 | 58 | 54 | 55 | 52 | 48 | 48 | 46 | 43 |
| 4   | 78  | 67  | 60  | 54  | 73  | 64  | 57  | 51  | 56 | 51 | 47 | 50 | 46 | 42 | 44 | 40 | 38 |
| 5   | 72  | 60  | 52  | 47  | 67  | 57  | 50  | 45  | 51 | 45 | 41 | 45 | 41 | 37 | 40 | 36 | 33 |
| 6   | 66  | 55  | 47  | 41  | 62  | 52  | 44  | 39  | 46 | 40 | 36 | 41 | 36 | 33 | 36 | 32 | 30 |
| 7   | 62  | 49  | 42  | 36  | 58  | 47  | 40  | 35  | 42 | 36 | 32 | 38 | 33 | 29 | 33 | 29 | 27 |
| 8   | 57  | 45  | 37  | 32  | 54  | 43  | 36  | 31  | 39 | 33 | 29 | 34 | 30 | 26 | 31 | 27 | 24 |
| 9   | 54  | 41  | 34  | 29  | 50  | 39  | 33  | 28  | 36 | 30 | 26 | 32 | 27 | 24 | 28 | 25 | 22 |
| 10  | 50  | 38  | 31  | 26  | 47  | 36  | 30  | 25  | 33 | 27 | 24 | 30 | 25 | 22 | 26 | 23 | 20 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 4015 | 4015 | 4015 |
| 5°  | 4021 | 3952 | 3977 |
| 10° | 3981 | 3875 | 3849 |
| 15° | 3927 | 3747 | 3649 |
| 20° | 3854 | 3571 | 3404 |
| 25° | 3780 | 3374 | 3168 |
| 30° | 3680 | 3171 | 2867 |
| 35° | 3583 | 2954 | 2604 |
| 40° | 3483 | 2728 | 2301 |
| 45° | 3368 | 2478 | 2027 |
| 50° | 3248 | 2226 | 1759 |
| 55° | 3124 | 1956 | 1501 |
| 60° | 2979 | 1673 | 1237 |
| 65° | 2813 | 1386 | 1114 |
| 70° | 2612 | 1119 | 1009 |
| 75° | 2359 | 987  | 919  |
| 80° | 1993 | 830  | 800  |
| 85° | 1388 | 557  | 606  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 3368 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 515.5   | 2.8       |
| 10°-20°   | 1415.1  | 7.8       |
| 20°-30°   | 1986.8  | 10.9      |
| 30°-40°   | 2165.7  | 11.9      |
| 40°-50°   | 1990.5  | 10.9      |
| 50°-60°   | 1563.2  | 8.6       |
| 60°-70°   | 1017.5  | 5.6       |
| 70°-80°   | 523.8   | 2.9       |
| 80°-90°   | 140.7   | 0.8       |
| 90°-100°  | 151.9   | 0.8       |
| 100°-110° | 482.7   | 2.7       |
| 110°-120° | 826.1   | 4.5       |
| 120°-130° | 1086.4  | 6.0       |
| 130°-140° | 1219.5  | 6.7       |
| 140°-150° | 1195.8  | 6.6       |
| 150°-160° | 1003.1  | 5.5       |
| 160°-170° | 665.3   | 3.7       |
| 170°-180° | 232.5   | 1.3       |
| 0°-30°    | 3917.3  | 21.5      |
| 0°-40°    | 6083.0  | 33.5      |
| 0°-60°    | 9636.8  | 53.0      |
| 0°-90°    | 11318.7 | 62.3      |
| 90°-120°  | 1460.7  | 8.0       |
| 90°-150°  | 4962.4  | 27.3      |
| 90°-180°  | 6863.0  | 37.7      |
| 0°-180°   | 18182.1 | 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    | 27    | 72   | 68    | 70   | 18   |
| 95°  | 108  | 129   | 132  | 132   | 129  | 120  |
| 105° | 446  | 452   | 456  | 460   | 460  | 470  |
| 115° | 829  | 841   | 837  | 835   | 829  | 820  |
| 125° | 1206 | 1224  | 1218 | 1212  | 1210 | 1077 |
| 135° | 1560 | 1582  | 1587 | 1585  | 1579 | 1205 |
| 145° | 1893 | 1908  | 1920 | 1922  | 1914 | 1183 |
| 155° | 2165 | 2171  | 2178 | 2188  | 2181 | 997  |
| 165° | 2355 | 2353  | 2353 | 2368  | 2357 | 664  |
| 175° | 2451 | 2445  | 2440 | 2455  | 2443 | 233  |
| 180° | 2455 | 2455  | 2455 | 2455  | 2455 |      |

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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°    | 2.2    | 26.6   | 72.5   | 68.1   | 70.3   |
| 92.5°  | 45.9   | 62.2   | 64.4   | 66.7   | 66.7   |
| 95°    | 108.0  | 128.8  | 132.5  | 132.5  | 128.8  |
| 97.5°  | 179.9  | 199.1  | 207.3  | 207.3  | 207.3  |
| 100°   | 262.7  | 279.8  | 285.7  | 285.7  | 283.5  |
| 102.5° | 350.1  | 362.6  | 370.8  | 373.1  | 370.8  |
| 105°   | 445.6  | 451.5  | 455.9  | 459.7  | 459.7  |
| 107.5° | 540.3  | 549.2  | 549.2  | 550.7  | 540.3  |
| 110°   | 632.1  | 644.0  | 644.0  | 644.0  | 638.0  |



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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 731.3  | 743.9  | 741.7  | 735.7  | 731.3  |
| 115°   | 829.0  | 840.8  | 837.2  | 835.0  | 829.0  |
| 117.5° | 925.9  | 942.2  | 931.9  | 925.9  | 920.0  |
| 120°   | 1023.6 | 1039.9 | 1023.6 | 1023.6 | 1017.0 |
| 122.5° | 1112.4 | 1133.2 | 1122.9 | 1116.9 | 1112.4 |
| 125°   | 1205.7 | 1224.2 | 1218.3 | 1211.7 | 1209.5 |
| 127.5° | 1296.8 | 1319.7 | 1311.6 | 1302.7 | 1296.8 |
| 130°   | 1381.9 | 1408.5 | 1404.9 | 1400.4 | 1392.2 |
| 132.5° | 1477.4 | 1498.1 | 1499.6 | 1489.3 | 1483.3 |
| 135°   | 1559.6 | 1582.4 | 1587.0 | 1584.7 | 1578.8 |
| 137.5° | 1651.3 | 1669.8 | 1673.5 | 1672.0 | 1663.2 |
| 140°   | 1732.0 | 1750.6 | 1760.9 | 1760.9 | 1752.8 |
| 142.5° | 1814.9 | 1833.4 | 1839.3 | 1841.5 | 1833.4 |
| 145°   | 1893.4 | 1908.1 | 1920.0 | 1922.2 | 1914.1 |
| 147.5° | 1963.7 | 1982.2 | 1991.1 | 1994.8 | 1986.7 |
| 150°   | 2036.2 | 2048.8 | 2057.0 | 2063.6 | 2057.0 |
| 152.5° | 2100.6 | 2113.2 | 2123.5 | 2131.7 | 2123.5 |
| 155°   | 2165.0 | 2170.9 | 2177.6 | 2187.9 | 2181.3 |
| 157.5° | 2220.6 | 2225.0 | 2228.6 | 2243.5 | 2233.1 |
| 160°   | 2270.1 | 2274.6 | 2276.8 | 2289.3 | 2280.4 |
| 162.5° | 2316.0 | 2316.0 | 2318.3 | 2332.2 | 2321.9 |
| 165°   | 2355.2 | 2353.0 | 2353.0 | 2367.8 | 2357.4 |
| 167.5° | 2390.8 | 2384.1 | 2384.1 | 2398.9 | 2388.6 |
| 170°   | 2417.4 | 2411.5 | 2409.3 | 2424.1 | 2411.5 |
| 172.5° | 2435.9 | 2429.9 | 2427.7 | 2442.6 | 2429.9 |
| 175°   | 2450.7 | 2444.8 | 2440.4 | 2455.1 | 2442.6 |
| 177.5° | 2458.9 | 2452.9 | 2448.5 | 2461.1 | 2448.5 |
| 180°   | 2455.1 | 2455.1 | 2455.1 | 2455.1 | 2455.1 |

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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 | 13.06            | 14.00 | 13.91 | 14.87 | 15.95 | 9.02           | 9.96  | 9.87  | 10.83 | 11.92 |
|                 | 3H   | 14.74            | 15.59 | 15.61 | 16.46 | 17.58 | 10.22          | 11.06 | 11.08 | 11.94 | 13.05 |
|                 | 4H   | 15.36            | 16.15 | 16.24 | 17.04 | 18.16 | 10.67          | 11.47 | 11.55 | 12.35 | 13.48 |
|                 | 6H   | 15.79            | 16.52 | 16.68 | 17.41 | 18.55 | 11.00          | 11.73 | 11.89 | 12.62 | 13.76 |
|                 | 8H   | 15.92            | 16.62 | 16.82 | 17.53 | 18.66 | 11.10          | 11.79 | 12.00 | 12.70 | 13.84 |
|                 | 12H  | 15.99            | 16.65 | 16.89 | 17.55 | 18.71 | 11.14          | 11.81 | 12.05 | 12.71 | 13.87 |
| 4H              | 2H   | 13.09            | 13.88 | 13.97 | 14.77 | 15.89 | 9.63           | 10.43 | 10.52 | 11.31 | 12.43 |
|                 | 3H   | 14.93            | 15.59 | 15.83 | 16.51 | 17.65 | 10.99          | 11.65 | 11.89 | 12.57 | 13.71 |
|                 | 4H   | 15.63            | 16.23 | 16.54 | 17.14 | 18.31 | 11.55          | 12.15 | 12.45 | 13.06 | 14.22 |
|                 | 6H   | 16.15            | 16.67 | 17.07 | 17.61 | 18.77 | 11.97          | 12.49 | 12.89 | 13.42 | 14.59 |
|                 | 8H   | 16.33            | 16.81 | 17.26 | 17.74 | 18.93 | 12.10          | 12.59 | 13.03 | 13.52 | 14.70 |
|                 | 12H  | 16.43            | 16.87 | 17.38 | 17.82 | 19.00 | 12.17          | 12.61 | 13.12 | 13.56 | 14.74 |
| 8H              | 4H   | 15.60            | 16.09 | 16.53 | 17.02 | 18.20 | 11.84          | 12.32 | 12.76 | 13.25 | 14.43 |
|                 | 6H   | 16.18            | 16.58 | 17.13 | 17.55 | 18.73 | 12.36          | 12.76 | 13.31 | 13.73 | 14.91 |
|                 | 8H   | 16.40            | 16.75 | 17.36 | 17.71 | 18.91 | 12.55          | 12.90 | 13.51 | 13.87 | 15.06 |
|                 | 12H  | 16.54            | 16.85 | 17.50 | 17.81 | 19.06 | 12.68          | 12.99 | 13.64 | 13.94 | 15.19 |
| 12H             | 4H   | 15.56            | 16.00 | 16.50 | 16.94 | 18.13 | 11.85          | 12.28 | 12.79 | 13.23 | 14.41 |
|                 | 6H   | 16.15            | 16.51 | 17.11 | 17.47 | 18.67 | 12.41          | 12.76 | 13.37 | 13.73 | 14.92 |
|                 | 8H   | 16.38            | 16.69 | 17.34 | 17.65 | 18.89 | 12.63          | 12.94 | 13.59 | 13.89 | 15.14 |