

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: P920424

Luminaire Tested: DFN2DIP-SQ4F0-090D090US935-FLLFLL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P920424  
REPORT IS A COMBINATION OF REPORTS P900119 AND P896915  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-SQ4F0-090D090US935-FLLFLL  
Description: 4 foot, Square Define Geo, with Direct Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

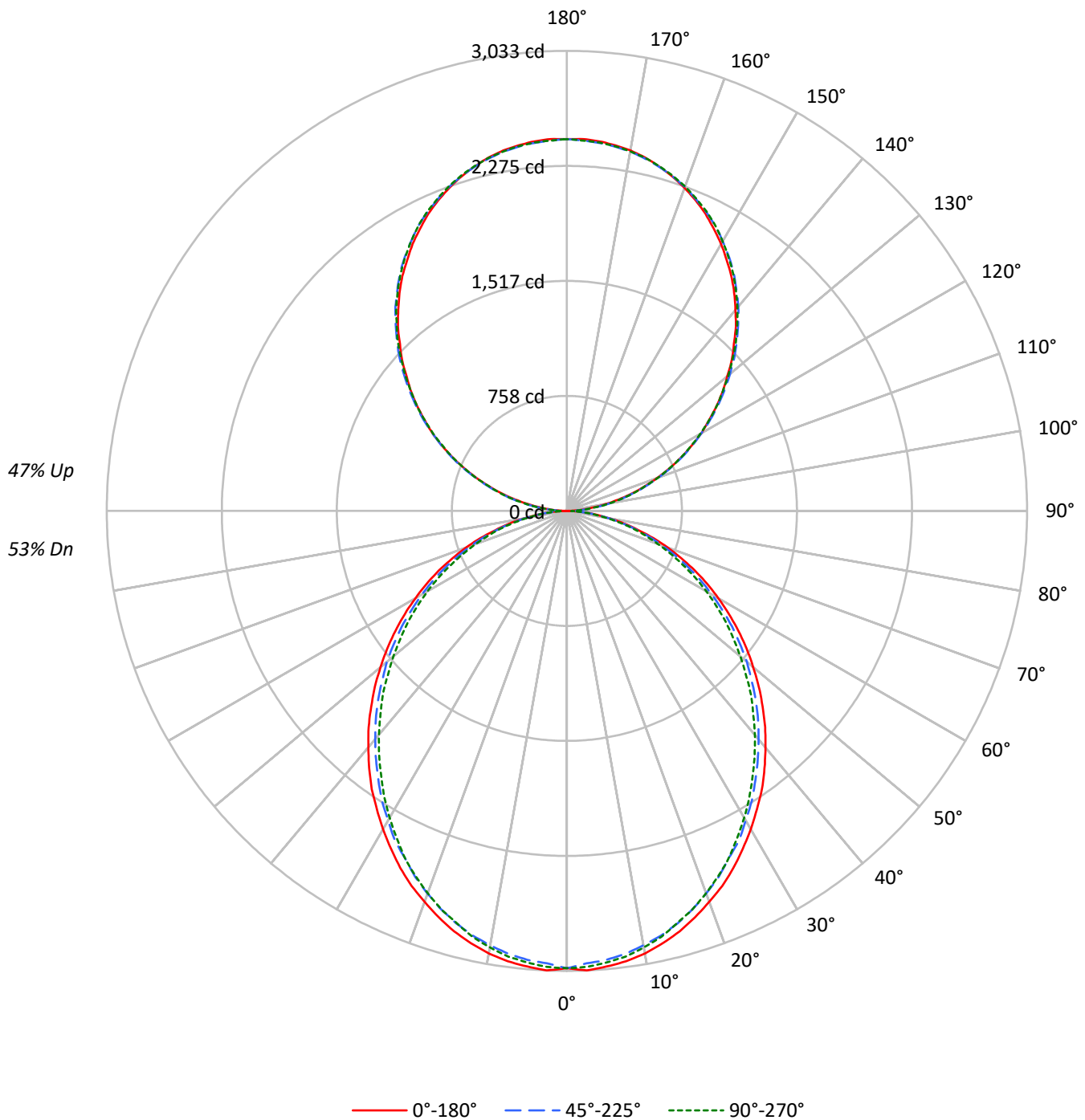
Lumens per Lamp: N/A  
Luminaire Lumens: 14529.3 lumens  
Efficiency: N/A  
Efficacy: 97.3 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 3.92' x L: 3.92' x H: 0.1')  
CIE Type: General Diffuse

Input Watts (W): 149.4  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.983  
Total Harmonic Distortion (THDi): 0.073  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT

TEST NUMBER: P920424

CATALOG NUMBER: DFN2DIP-SQ4F0-090D090US935-FLLFLL

### Luminous Intensity Polar Plot



TEST NUMBER: P920424

CATALOG NUMBER: DFN2DIP-SQ4F0-090D090US935-FLLFL

**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   | 108 | 108 | 108 | 108 | 100 | 100 | 100 | 100 | 85 | 85 | 85 | 71 | 71 | 71 | 59 | 59 | 59 |
| 1   | 98  | 94  | 90  | 87  | 91  | 87  | 84  | 81  | 74 | 72 | 70 | 63 | 61 | 59 | 52 | 51 | 50 |
| 2   | 90  | 82  | 76  | 71  | 83  | 76  | 71  | 66  | 65 | 61 | 58 | 55 | 52 | 50 | 46 | 44 | 42 |
| 3   | 82  | 72  | 65  | 59  | 75  | 67  | 61  | 55  | 58 | 53 | 49 | 49 | 45 | 42 | 41 | 38 | 36 |
| 4   | 75  | 64  | 56  | 50  | 69  | 60  | 52  | 47  | 51 | 46 | 41 | 43 | 39 | 36 | 36 | 33 | 31 |
| 5   | 69  | 57  | 49  | 43  | 63  | 53  | 46  | 40  | 46 | 40 | 36 | 39 | 35 | 31 | 33 | 29 | 27 |
| 6   | 63  | 51  | 43  | 37  | 58  | 48  | 40  | 35  | 41 | 36 | 31 | 35 | 31 | 27 | 30 | 26 | 24 |
| 7   | 59  | 46  | 38  | 33  | 54  | 43  | 36  | 31  | 37 | 32 | 28 | 32 | 28 | 24 | 27 | 24 | 21 |
| 8   | 54  | 42  | 34  | 29  | 50  | 39  | 32  | 27  | 34 | 29 | 24 | 29 | 25 | 22 | 25 | 21 | 19 |
| 9   | 51  | 38  | 31  | 26  | 47  | 36  | 29  | 24  | 31 | 26 | 22 | 27 | 23 | 19 | 23 | 20 | 17 |
| 10  | 47  | 35  | 28  | 23  | 44  | 33  | 26  | 22  | 29 | 23 | 20 | 25 | 21 | 18 | 21 | 18 | 15 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 2116 | 2116 | 2116 |
| 5°  | 2119 | 2087 | 2101 |
| 10° | 2102 | 2059 | 2073 |
| 15° | 2071 | 2025 | 2029 |
| 20° | 2029 | 1979 | 1984 |
| 25° | 1988 | 1923 | 1932 |
| 30° | 1935 | 1871 | 1866 |
| 35° | 1886 | 1809 | 1796 |
| 40° | 1825 | 1747 | 1729 |
| 45° | 1765 | 1685 | 1661 |
| 50° | 1699 | 1620 | 1582 |
| 55° | 1629 | 1545 | 1509 |
| 60° | 1551 | 1455 | 1426 |
| 65° | 1465 | 1363 | 1328 |
| 70° | 1356 | 1250 | 1223 |
| 75° | 1205 | 1115 | 1127 |
| 80° | 1024 | 943  | 941  |
| 85° | 740  | 645  | 633  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 90°

Vertical Angle: 90°

Luminance: 1929 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 283.8   | 2.0       |
| 10°-20°   | 798.5   | 5.5       |
| 20°-30°   | 1173.4  | 8.1       |
| 30°-40°   | 1362.9  | 9.4       |
| 40°-50°   | 1361.2  | 9.4       |
| 50°-60°   | 1186.9  | 8.2       |
| 60°-70°   | 877.4   | 6.0       |
| 70°-80°   | 496.4   | 3.4       |
| 80°-90°   | 138.0   | 0.9       |
| 90°-100°  | 151.6   | 1.0       |
| 100°-110° | 481.8   | 3.3       |
| 110°-120° | 824.6   | 5.7       |
| 120°-130° | 1084.4  | 7.5       |
| 130°-140° | 1217.2  | 8.4       |
| 140°-150° | 1193.6  | 8.2       |
| 150°-160° | 1001.3  | 6.9       |
| 160°-170° | 664.0   | 4.6       |
| 170°-180° | 232.1   | 1.6       |
| 0°-30°    | 2255.7  | 15.5      |
| 0°-40°    | 3618.6  | 24.9      |
| 0°-60°    | 6166.7  | 42.4      |
| 0°-90°    | 7678.5  | 52.8      |
| 90°-120°  | 1458.0  | 10.0      |
| 90°-150°  | 4953.4  | 34.1      |
| 90°-180°  | 6851.0  | 47.2      |
| 0°-180°   | 14529.3 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 3015 | 3015  | 3015 | 3015  | 3015 |      |
| 5°   | 3015 | 3004  | 2972 | 2995  | 2989 | 286  |
| 15°  | 2870 | 2853  | 2815 | 2827  | 2812 | 808  |
| 25°  | 2598 | 2575  | 2526 | 2531  | 2526 | 1195 |
| 35°  | 2241 | 2212  | 2166 | 2148  | 2134 | 1400 |
| 45°  | 1824 | 1804  | 1760 | 1728  | 1716 | 1408 |
| 55°  | 1380 | 1363  | 1328 | 1293  | 1279 | 1234 |
| 65°  | 931  | 913   | 884  | 858   | 844  | 920  |
| 75°  | 487  | 481   | 467  | 449   | 455  | 520  |
| 85°  | 119  | 116   | 113  | 104   | 102  | 132  |
| 90°  | 2    | 27    | 72   | 68    | 70   | 14   |
| 95°  | 108  | 128   | 132  | 132   | 128  | 120  |
| 105° | 445  | 451   | 455  | 459   | 459  | 469  |
| 115° | 828  | 839   | 836  | 833   | 828  | 818  |
| 125° | 1204 | 1222  | 1216 | 1209  | 1207 | 1076 |
| 135° | 1557 | 1580  | 1584 | 1582  | 1576 | 1203 |
| 145° | 1890 | 1905  | 1916 | 1919  | 1911 | 1181 |
| 155° | 2161 | 2167  | 2174 | 2184  | 2177 | 995  |
| 165° | 2351 | 2349  | 2349 | 2364  | 2353 | 663  |
| 175° | 2446 | 2440  | 2436 | 2451  | 2438 | 232  |
| 180° | 2451 | 2451  | 2451 | 2451  | 2451 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 3015.1 | 3015.1 | 3015.1 | 3015.1 | 3015.1 |
| 2.5°   | 3032.7 | 3018.2 | 2986.3 | 3015.1 | 3009.6 |
| 5°     | 3015.1 | 3003.8 | 2971.8 | 2994.9 | 2989.3 |
| 7.5°   | 2994.9 | 2977.7 | 2945.6 | 2969.1 | 2963.2 |
| 10°    | 2963.2 | 2942.9 | 2908.1 | 2931.2 | 2922.6 |
| 12.5°  | 2919.5 | 2902.3 | 2867.6 | 2881.9 | 2876.2 |
| 15°    | 2870.3 | 2853.1 | 2815.2 | 2826.9 | 2812.4 |
| 17.5°  | 2809.3 | 2792.1 | 2754.3 | 2768.8 | 2754.3 |
| 20°    | 2742.6 | 2725.4 | 2684.8 | 2693.4 | 2682.0 |
| 22.5°  | 2676.2 | 2650.1 | 2612.2 | 2612.2 | 2606.3 |
| 25°    | 2597.7 | 2574.6 | 2525.5 | 2531.0 | 2525.5 |
| 27.5°  | 2510.7 | 2490.4 | 2452.9 | 2444.3 | 2429.8 |
| 30°    | 2424.0 | 2400.5 | 2357.2 | 2348.5 | 2336.9 |
| 32.5°  | 2331.1 | 2313.8 | 2267.4 | 2249.9 | 2238.2 |
| 35°    | 2241.3 | 2212.3 | 2165.8 | 2148.4 | 2133.9 |
| 37.5°  | 2139.8 | 2113.6 | 2067.1 | 2046.9 | 2032.4 |
| 40°    | 2035.4 | 2012.1 | 1965.6 | 1939.7 | 1928.1 |
| 42.5°  | 1933.9 | 1910.6 | 1864.4 | 1835.2 | 1818.0 |
| 45°    | 1823.8 | 1803.5 | 1759.8 | 1728.1 | 1716.5 |
| 47.5°  | 1716.5 | 1696.2 | 1649.7 | 1617.7 | 1600.5 |
| 50°    | 1603.3 | 1588.8 | 1548.2 | 1507.6 | 1493.1 |
| 52.5°  | 1493.1 | 1472.8 | 1435.3 | 1403.3 | 1383.0 |
| 55°    | 1380.3 | 1362.7 | 1327.9 | 1293.2 | 1278.8 |
| 57.5°  | 1267.0 | 1252.6 | 1214.8 | 1180.0 | 1168.3 |
| 60°    | 1153.8 | 1142.5 | 1101.8 | 1069.9 | 1061.3 |
| 62.5°  | 1043.7 | 1023.4 | 994.5  | 965.6  | 953.9  |
| 65°    | 930.8  | 913.3  | 884.3  | 858.2  | 843.8  |
| 67.5°  | 814.8  | 800.1  | 774.2  | 754.0  | 742.3  |
| 70°    | 707.5  | 695.8  | 669.7  | 649.4  | 638.0  |
| 72.5°  | 597.4  | 585.7  | 571.2  | 551.0  | 542.3  |
| 75°    | 487.0  | 481.4  | 466.7  | 449.4  | 455.3  |
| 77.5°  | 388.5  | 376.9  | 371.0  | 362.4  | 353.8  |
| 80°    | 290.1  | 287.0  | 281.1  | 272.5  | 266.7  |
| 82.5°  | 197.2  | 197.2  | 194.4  | 182.7  | 182.7  |
| 85°    | 118.7  | 116.0  | 113.2  | 104.3  | 101.5  |
| 87.5°  | 52.3   | 46.4   | 40.6   | 32.0   | 28.9   |
| 90°    | 2.2    | 26.6   | 72.4   | 67.9   | 70.2   |
| 92.5°  | 45.8   | 62.1   | 64.3   | 66.5   | 66.5   |
| 95°    | 107.9  | 128.5  | 132.2  | 132.2  | 128.5  |
| 97.5°  | 179.5  | 198.7  | 206.9  | 206.9  | 206.9  |
| 100°   | 262.3  | 279.3  | 285.2  | 285.2  | 283.0  |
| 102.5° | 349.5  | 362.0  | 370.1  | 372.4  | 370.1  |
| 105°   | 444.8  | 450.6  | 455.1  | 458.8  | 458.8  |
| 107.5° | 539.3  | 548.2  | 548.2  | 549.7  | 539.3  |
| 110°   | 630.9  | 642.8  | 642.8  | 642.8  | 636.9  |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 730.0  | 742.5  | 740.3  | 734.4  | 730.0  |
| 115°   | 827.5  | 839.3  | 835.6  | 833.4  | 827.5  |
| 117.5° | 924.3  | 940.6  | 930.2  | 924.3  | 918.3  |
| 120°   | 1021.8 | 1038.0 | 1021.8 | 1021.8 | 1015.1 |
| 122.5° | 1110.4 | 1131.2 | 1120.8 | 1114.9 | 1110.4 |
| 125°   | 1203.6 | 1222.0 | 1216.2 | 1209.4 | 1207.3 |
| 127.5° | 1294.4 | 1317.3 | 1309.2 | 1300.4 | 1294.4 |
| 130°   | 1379.4 | 1406.0 | 1402.3 | 1397.8 | 1389.7 |
| 132.5° | 1474.7 | 1495.4 | 1496.8 | 1486.5 | 1480.7 |
| 135°   | 1556.7 | 1579.6 | 1584.1 | 1581.8 | 1576.0 |
| 137.5° | 1648.3 | 1666.8 | 1670.5 | 1669.0 | 1660.2 |
| 140°   | 1728.9 | 1747.3 | 1757.6 | 1757.6 | 1749.5 |
| 142.5° | 1811.6 | 1830.1 | 1836.0 | 1838.2 | 1830.1 |
| 145°   | 1890.0 | 1904.7 | 1916.5 | 1918.7 | 1910.6 |
| 147.5° | 1960.1 | 1978.6 | 1987.4 | 1991.1 | 1983.1 |
| 150°   | 2032.6 | 2045.1 | 2053.2 | 2059.9 | 2053.2 |
| 152.5° | 2096.8 | 2109.4 | 2119.7 | 2127.9 | 2119.7 |
| 155°   | 2161.1 | 2167.0 | 2173.7 | 2184.0 | 2177.4 |
| 157.5° | 2216.5 | 2220.9 | 2224.6 | 2239.4 | 2229.0 |
| 160°   | 2266.0 | 2270.5 | 2272.7 | 2285.2 | 2276.3 |
| 162.5° | 2311.8 | 2311.8 | 2314.0 | 2328.1 | 2317.7 |
| 165°   | 2351.0 | 2348.7 | 2348.7 | 2363.5 | 2353.2 |
| 167.5° | 2386.4 | 2379.8 | 2379.8 | 2394.5 | 2384.2 |
| 170°   | 2413.0 | 2407.1 | 2404.9 | 2419.7 | 2407.1 |
| 172.5° | 2431.5 | 2425.6 | 2423.4 | 2438.2 | 2425.6 |
| 175°   | 2446.3 | 2440.3 | 2435.9 | 2450.7 | 2438.2 |
| 177.5° | 2454.4 | 2448.5 | 2444.0 | 2456.6 | 2444.0 |
| 180°   | 2450.7 | 2450.7 | 2450.7 | 2450.7 | 2450.7 |

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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 | 10.15            | 11.03 | 11.08 | 11.98 | 13.21 | 9.70           | 10.59 | 10.63 | 11.54 | 12.77 |
|                 | 3H   | 11.81            | 12.61 | 12.76 | 13.57 | 14.82 | 11.32          | 12.12 | 12.27 | 13.08 | 14.33 |
|                 | 4H   | 12.40            | 13.16 | 13.36 | 14.12 | 15.38 | 11.91          | 12.66 | 12.87 | 13.63 | 14.89 |
|                 | 6H   | 12.81            | 13.50 | 13.78 | 14.47 | 15.75 | 12.31          | 13.00 | 13.28 | 13.97 | 15.25 |
|                 | 8H   | 12.92            | 13.58 | 13.89 | 14.56 | 15.84 | 12.42          | 13.08 | 13.39 | 14.06 | 15.33 |
|                 | 12H  | 12.97            | 13.60 | 13.95 | 14.58 | 15.87 | 12.46          | 13.09 | 13.44 | 14.07 | 15.36 |
| 4H              | 2H   | 10.61            | 11.36 | 11.57 | 12.33 | 13.59 | 10.26          | 11.01 | 11.22 | 11.97 | 13.24 |
|                 | 3H   | 12.48            | 13.11 | 13.46 | 14.11 | 15.38 | 12.08          | 12.71 | 13.05 | 13.70 | 14.97 |
|                 | 4H   | 13.20            | 13.78 | 14.19 | 14.76 | 16.06 | 12.78          | 13.35 | 13.76 | 14.34 | 15.64 |
|                 | 6H   | 13.72            | 14.22 | 14.72 | 15.23 | 16.53 | 13.29          | 13.79 | 14.29 | 14.80 | 16.10 |
|                 | 8H   | 13.88            | 14.34 | 14.87 | 15.34 | 16.66 | 13.44          | 13.90 | 14.44 | 14.91 | 16.22 |
|                 | 12H  | 13.95            | 14.37 | 14.97 | 15.39 | 16.71 | 13.50          | 13.92 | 14.52 | 14.94 | 16.26 |
| 8H              | 4H   | 13.40            | 13.86 | 14.40 | 14.87 | 16.18 | 13.03          | 13.49 | 14.02 | 14.49 | 15.80 |
|                 | 6H   | 14.04            | 14.42 | 15.06 | 15.47 | 16.78 | 13.66          | 14.04 | 14.68 | 15.08 | 16.39 |
|                 | 8H   | 14.26            | 14.60 | 15.29 | 15.63 | 16.96 | 13.87          | 14.21 | 14.90 | 15.24 | 16.57 |
|                 | 12H  | 14.40            | 14.70 | 15.43 | 15.72 | 17.10 | 13.99          | 14.29 | 15.02 | 15.31 | 16.69 |
| 12H             | 4H   | 13.39            | 13.81 | 14.40 | 14.83 | 16.14 | 13.02          | 13.44 | 14.04 | 14.46 | 15.78 |
|                 | 6H   | 14.07            | 14.41 | 15.10 | 15.44 | 16.77 | 13.70          | 14.04 | 14.73 | 15.07 | 16.40 |
|                 | 8H   | 14.32            | 14.61 | 15.35 | 15.64 | 17.01 | 13.94          | 14.23 | 14.97 | 15.26 | 16.63 |