

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: P914364

Luminaire Tested: DFN2DIP-PN4F0-120D090US927-FLLFLL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P914364  
REPORT IS A COMBINATION OF REPORTS P899715 AND P896497  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-PN4F0-120D090US927-FLLFLL  
Description: 4 foot, Pentagon Define Geo, with Direct Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

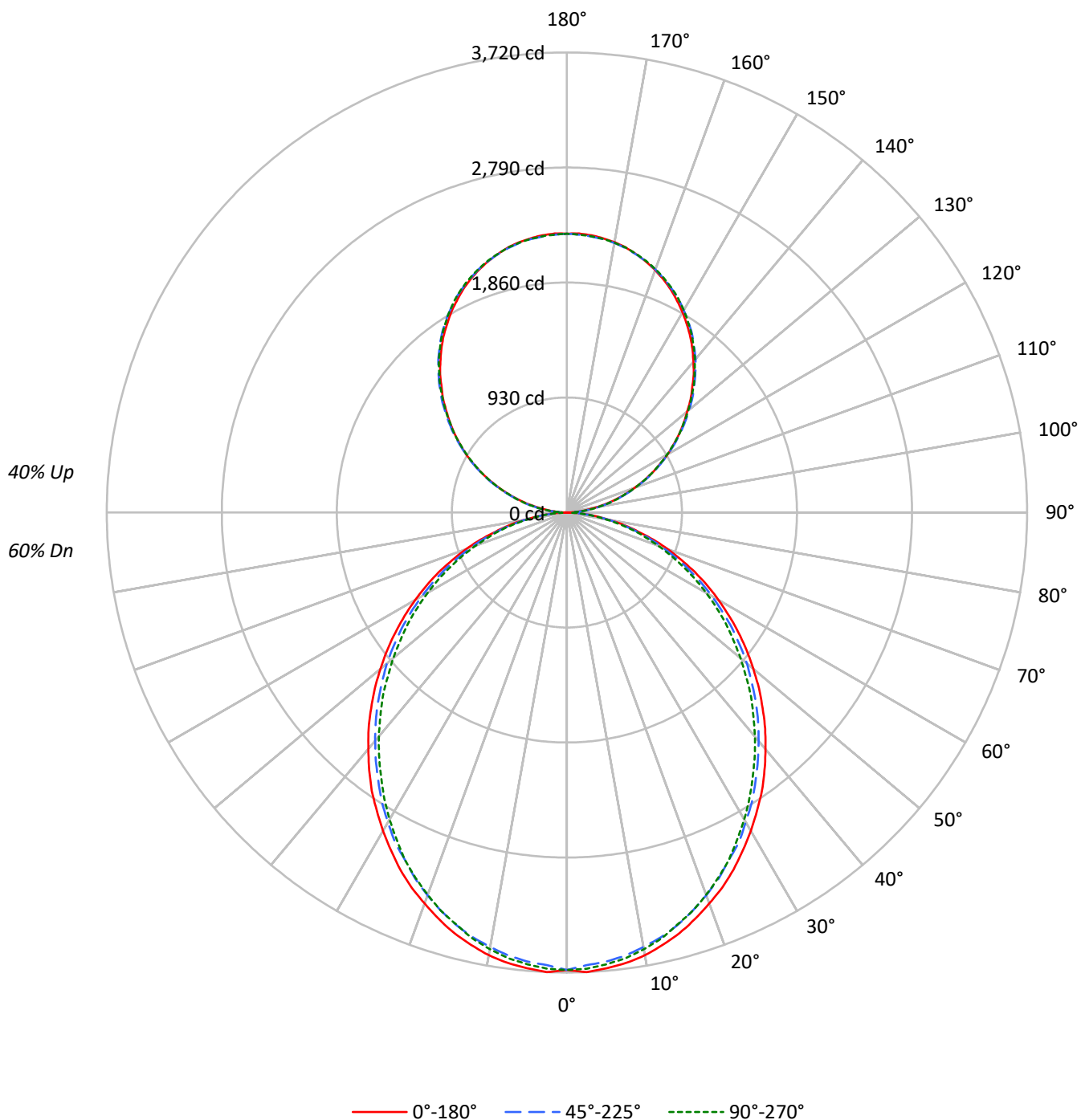
**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 15720.9 lumens  
Efficiency: N/A  
Efficacy: 81.5 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 3.74' x L: 3.94' x H: 0.1')  
CIE Type: General Diffuse  
  
Input Watts (W): 192.9  
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



TEST NUMBER: P914364

CATALOG NUMBER: DFN2DIP-PN4F0-120D090US927-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   | 110 | 110 | 110 | 110 | 102 | 102 | 102 | 102 | 89 | 89 | 89 | 77 | 77 | 77 | 65 | 65 | 65 |
| 1   | 100 | 96  | 92  | 88  | 93  | 89  | 86  | 83  | 78 | 75 | 73 | 67 | 66 | 64 | 58 | 56 | 55 |
| 2   | 91  | 84  | 77  | 72  | 85  | 78  | 73  | 68  | 68 | 64 | 61 | 59 | 56 | 53 | 51 | 48 | 46 |
| 3   | 83  | 73  | 66  | 60  | 77  | 69  | 62  | 57  | 60 | 55 | 51 | 52 | 48 | 45 | 45 | 42 | 40 |
| 4   | 76  | 65  | 57  | 51  | 71  | 61  | 54  | 48  | 54 | 48 | 43 | 47 | 42 | 39 | 40 | 37 | 34 |
| 5   | 70  | 58  | 50  | 44  | 65  | 55  | 47  | 42  | 48 | 42 | 38 | 42 | 37 | 34 | 36 | 33 | 30 |
| 6   | 64  | 52  | 44  | 38  | 60  | 49  | 42  | 36  | 43 | 37 | 33 | 38 | 33 | 29 | 33 | 29 | 26 |
| 7   | 60  | 47  | 39  | 33  | 56  | 44  | 37  | 32  | 39 | 33 | 29 | 35 | 30 | 26 | 30 | 26 | 23 |
| 8   | 55  | 43  | 35  | 30  | 52  | 40  | 33  | 28  | 36 | 30 | 26 | 32 | 27 | 23 | 28 | 24 | 21 |
| 9   | 52  | 39  | 32  | 26  | 48  | 37  | 30  | 25  | 33 | 27 | 23 | 29 | 24 | 21 | 26 | 22 | 19 |
| 10  | 48  | 36  | 29  | 24  | 45  | 34  | 27  | 23  | 30 | 25 | 21 | 27 | 22 | 19 | 24 | 20 | 17 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 2700 | 2700 | 2700 |
| 5°  | 2704 | 2663 | 2681 |
| 10° | 2682 | 2627 | 2645 |
| 15° | 2643 | 2584 | 2589 |
| 20° | 2590 | 2525 | 2531 |
| 25° | 2537 | 2453 | 2465 |
| 30° | 2470 | 2387 | 2380 |
| 35° | 2407 | 2308 | 2290 |
| 40° | 2330 | 2229 | 2204 |
| 45° | 2252 | 2149 | 2117 |
| 50° | 2168 | 2066 | 2016 |
| 55° | 2079 | 1970 | 1923 |
| 60° | 1979 | 1855 | 1817 |
| 65° | 1870 | 1737 | 1691 |
| 70° | 1732 | 1592 | 1556 |
| 75° | 1539 | 1419 | 1432 |
| 80° | 1307 | 1199 | 1195 |
| 85° | 946  | 819  | 799  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°  
Vertical Angle: 45°  
Luminance: 2252 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 348.1   | 2.2       |
| 10°-20°   | 979.5   | 6.2       |
| 20°-30°   | 1439.5  | 9.2       |
| 30°-40°   | 1671.9  | 10.6      |
| 40°-50°   | 1669.9  | 10.6      |
| 50°-60°   | 1456.0  | 9.3       |
| 60°-70°   | 1076.3  | 6.8       |
| 70°-80°   | 609.0   | 3.9       |
| 80°-90°   | 167.1   | 1.1       |
| 90°-100°  | 139.5   | 0.9       |
| 100°-110° | 443.3   | 2.8       |
| 110°-120° | 758.7   | 4.8       |
| 120°-130° | 997.8   | 6.3       |
| 130°-140° | 1120.0  | 7.1       |
| 140°-150° | 1098.2  | 7.0       |
| 150°-160° | 921.3   | 5.9       |
| 160°-170° | 611.0   | 3.9       |
| 170°-180° | 213.5   | 1.4       |
| 0°-30°    | 2767.2  | 17.6      |
| 0°-40°    | 4439.1  | 28.2      |
| 0°-60°    | 7565.0  | 48.1      |
| 0°-90°    | 9417.5  | 59.9      |
| 90°-120°  | 1341.5  | 8.5       |
| 90°-150°  | 4557.5  | 29.0      |
| 90°-180°  | 6303.0  | 40.1      |
| 0°-180°   | 15720.9 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 3699 | 3699  | 3699 | 3699  | 3699 |      |
| 5°   | 3699 | 3685  | 3646 | 3674  | 3667 | 351  |
| 15°  | 3521 | 3500  | 3454 | 3468  | 3450 | 992  |
| 25°  | 3187 | 3158  | 3098 | 3105  | 3098 | 1466 |
| 35°  | 2749 | 2714  | 2657 | 2636  | 2618 | 1717 |
| 45°  | 2237 | 2212  | 2159 | 2120  | 2106 | 1727 |
| 55°  | 1693 | 1672  | 1629 | 1586  | 1569 | 1514 |
| 65°  | 1142 | 1120  | 1085 | 1053  | 1035 | 1129 |
| 75°  | 597  | 591   | 572  | 551   | 558  | 638  |
| 85°  | 146  | 142   | 139  | 128   | 124  | 162  |
| 90°  | 2    | 24    | 67   | 62    | 65   | 15   |
| 95°  | 99   | 118   | 122  | 122   | 118  | 110  |
| 105° | 409  | 415   | 419  | 422   | 422  | 432  |
| 115° | 761  | 772   | 769  | 767   | 761  | 753  |
| 125° | 1107 | 1124  | 1119 | 1113  | 1111 | 990  |
| 135° | 1432 | 1453  | 1458 | 1455  | 1450 | 1107 |
| 145° | 1739 | 1752  | 1763 | 1765  | 1758 | 1086 |
| 155° | 1988 | 1994  | 2000 | 2009  | 2003 | 915  |
| 165° | 2163 | 2161  | 2161 | 2175  | 2165 | 610  |
| 175° | 2251 | 2245  | 2241 | 2255  | 2243 | 214  |
| 180° | 2255 | 2255  | 2255 | 2255  | 2255 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 3698.9 | 3698.9 | 3698.9 | 3698.9 | 3698.9 |
| 2.5°   | 3720.4 | 3702.7 | 3663.4 | 3698.9 | 3692.1 |
| 5°     | 3698.9 | 3684.9 | 3645.7 | 3674.0 | 3667.2 |
| 7.5°   | 3674.0 | 3652.8 | 3613.6 | 3642.3 | 3635.2 |
| 10°    | 3635.2 | 3610.2 | 3567.6 | 3595.9 | 3585.3 |
| 12.5°  | 3581.5 | 3560.4 | 3517.8 | 3535.5 | 3528.3 |
| 15°    | 3521.2 | 3500.0 | 3453.6 | 3467.9 | 3450.2 |
| 17.5°  | 3446.5 | 3425.3 | 3378.9 | 3396.6 | 3378.9 |
| 20°    | 3364.6 | 3343.4 | 3293.7 | 3304.2 | 3290.2 |
| 22.5°  | 3283.0 | 3251.0 | 3204.5 | 3204.5 | 3197.4 |
| 25°    | 3186.8 | 3158.5 | 3098.1 | 3105.0 | 3098.1 |
| 27.5°  | 3080.0 | 3055.1 | 3009.1 | 2998.5 | 2980.8 |
| 30°    | 2973.6 | 2944.9 | 2891.7 | 2881.2 | 2866.8 |
| 32.5°  | 2859.6 | 2838.5 | 2781.5 | 2760.0 | 2745.7 |
| 35°    | 2749.4 | 2714.0 | 2657.0 | 2635.5 | 2617.8 |
| 37.5°  | 2624.9 | 2592.9 | 2535.9 | 2511.0 | 2493.2 |
| 40°    | 2497.0 | 2468.4 | 2411.3 | 2379.6 | 2365.3 |
| 42.5°  | 2372.5 | 2343.8 | 2287.2 | 2251.4 | 2230.2 |
| 45°    | 2237.4 | 2212.5 | 2158.9 | 2120.0 | 2105.7 |
| 47.5°  | 2105.7 | 2080.7 | 2023.8 | 1984.6 | 1963.4 |
| 50°    | 1966.8 | 1949.1 | 1899.3 | 1849.4 | 1831.7 |
| 52.5°  | 1831.7 | 1806.8 | 1760.8 | 1721.5 | 1696.6 |
| 55°    | 1693.2 | 1671.7 | 1629.0 | 1586.4 | 1568.7 |
| 57.5°  | 1554.3 | 1536.6 | 1490.2 | 1447.6 | 1433.2 |
| 60°    | 1415.5 | 1401.5 | 1351.7 | 1312.5 | 1301.9 |
| 62.5°  | 1280.4 | 1255.4 | 1220.0 | 1184.5 | 1170.2 |
| 65°    | 1141.9 | 1120.4 | 1084.9 | 1052.8 | 1035.1 |
| 67.5°  | 999.7  | 981.5  | 949.8  | 925.0  | 910.6  |
| 70°    | 867.9  | 853.6  | 821.5  | 796.6  | 782.7  |
| 72.5°  | 732.8  | 718.5  | 700.8  | 675.9  | 665.3  |
| 75°    | 597.4  | 590.6  | 572.4  | 551.4  | 558.5  |
| 77.5°  | 476.6  | 462.2  | 455.1  | 444.5  | 434.0  |
| 80°    | 355.8  | 352.0  | 344.9  | 334.4  | 327.2  |
| 82.5°  | 241.9  | 241.9  | 238.5  | 224.2  | 224.2  |
| 85°    | 145.7  | 142.3  | 138.9  | 127.9  | 124.5  |
| 87.5°  | 64.2   | 57.0   | 49.8   | 39.2   | 35.5   |
| 90°    | 2.1    | 24.5   | 66.6   | 62.5   | 64.6   |
| 92.5°  | 42.1   | 57.1   | 59.2   | 61.2   | 61.2   |
| 95°    | 99.3   | 118.3  | 121.7  | 121.7  | 118.3  |
| 97.5°  | 165.2  | 182.8  | 190.4  | 190.4  | 190.4  |
| 100°   | 241.3  | 257.0  | 262.4  | 262.4  | 260.4  |
| 102.5° | 321.5  | 333.1  | 340.6  | 342.6  | 340.6  |
| 105°   | 409.2  | 414.6  | 418.7  | 422.2  | 422.2  |
| 107.5° | 496.2  | 504.4  | 504.4  | 505.7  | 496.2  |
| 110°   | 580.5  | 591.4  | 591.4  | 591.4  | 586.0  |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 671.6  | 683.2  | 681.1  | 675.7  | 671.6  |
| 115°   | 761.4  | 772.2  | 768.8  | 766.8  | 761.4  |
| 117.5° | 850.4  | 865.4  | 855.9  | 850.4  | 844.9  |
| 120°   | 940.2  | 955.1  | 940.2  | 940.2  | 934.0  |
| 122.5° | 1021.7 | 1040.8 | 1031.3 | 1025.8 | 1021.7 |
| 125°   | 1107.4 | 1124.3 | 1119.0 | 1112.8 | 1110.8 |
| 127.5° | 1191.0 | 1212.0 | 1204.6 | 1196.4 | 1191.0 |
| 130°   | 1269.2 | 1293.6 | 1290.2 | 1286.1 | 1278.7 |
| 132.5° | 1356.8 | 1375.9 | 1377.2 | 1367.7 | 1362.3 |
| 135°   | 1432.3 | 1453.3 | 1457.5 | 1455.4 | 1450.0 |
| 137.5° | 1516.6 | 1533.6 | 1537.0 | 1535.6 | 1527.5 |
| 140°   | 1590.7 | 1607.7 | 1617.2 | 1617.2 | 1609.7 |
| 142.5° | 1666.8 | 1683.8 | 1689.2 | 1691.3 | 1683.8 |
| 145°   | 1738.9 | 1752.5 | 1763.3 | 1765.4 | 1757.9 |
| 147.5° | 1803.5 | 1820.4 | 1828.6 | 1832.0 | 1824.6 |
| 150°   | 1870.1 | 1881.7 | 1889.1 | 1895.2 | 1889.1 |
| 152.5° | 1929.2 | 1940.8 | 1950.3 | 1957.8 | 1950.3 |
| 155°   | 1988.4 | 1993.8 | 1999.9 | 2009.4 | 2003.3 |
| 157.5° | 2039.3 | 2043.4 | 2046.8 | 2060.4 | 2050.9 |
| 160°   | 2084.9 | 2089.0 | 2091.0 | 2102.5 | 2094.4 |
| 162.5° | 2127.0 | 2127.0 | 2129.1 | 2142.0 | 2132.5 |
| 165°   | 2163.1 | 2161.0 | 2161.0 | 2174.6 | 2165.1 |
| 167.5° | 2195.7 | 2189.6 | 2189.6 | 2203.1 | 2193.6 |
| 170°   | 2220.2 | 2214.7 | 2212.7 | 2226.3 | 2214.7 |
| 172.5° | 2237.1 | 2231.7 | 2229.7 | 2243.3 | 2231.7 |
| 175°   | 2250.7 | 2245.3 | 2241.2 | 2254.9 | 2243.3 |
| 177.5° | 2258.2 | 2252.8 | 2248.7 | 2260.3 | 2248.7 |
| 180°   | 2254.9 | 2254.9 | 2254.9 | 2254.9 | 2254.9 |

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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 | 11.60            | 12.55 | 12.46 | 13.44 | 14.56 | 11.16          | 12.11 | 12.02 | 13.00 | 14.12 |
|                 | 3H   | 13.27            | 14.13 | 14.15 | 15.02 | 16.17 | 12.78          | 13.64 | 13.66 | 14.54 | 15.69 |
|                 | 4H   | 13.86            | 14.67 | 14.76 | 15.58 | 16.74 | 13.37          | 14.19 | 14.27 | 15.09 | 16.25 |
|                 | 6H   | 14.27            | 15.02 | 15.17 | 15.93 | 17.10 | 13.78          | 14.53 | 14.68 | 15.44 | 16.61 |
|                 | 8H   | 14.38            | 15.09 | 15.29 | 16.02 | 17.19 | 13.88          | 14.60 | 14.80 | 15.53 | 16.70 |
|                 | 12H  | 14.43            | 15.11 | 15.35 | 16.03 | 17.23 | 13.93          | 14.61 | 14.85 | 15.53 | 16.73 |
| 4H              | 2H   | 12.07            | 12.88 | 12.97 | 13.79 | 14.94 | 11.72          | 12.53 | 12.62 | 13.43 | 14.59 |
|                 | 3H   | 13.95            | 14.63 | 14.86 | 15.56 | 16.73 | 13.54          | 14.22 | 14.46 | 15.16 | 16.33 |
|                 | 4H   | 14.67            | 15.29 | 15.59 | 16.22 | 17.42 | 14.25          | 14.87 | 15.17 | 15.80 | 17.00 |
|                 | 6H   | 15.19            | 15.73 | 16.13 | 16.68 | 17.88 | 14.77          | 15.30 | 15.70 | 16.26 | 17.45 |
|                 | 8H   | 15.34            | 15.84 | 16.28 | 16.79 | 18.01 | 14.92          | 15.42 | 15.85 | 16.36 | 17.58 |
|                 | 12H  | 15.42            | 15.87 | 16.38 | 16.84 | 18.06 | 14.98          | 15.43 | 15.94 | 16.40 | 17.62 |
| 8H              | 4H   | 14.87            | 15.37 | 15.81 | 16.32 | 17.53 | 14.50          | 15.00 | 15.44 | 15.95 | 17.16 |
|                 | 6H   | 15.51            | 15.92 | 16.48 | 16.91 | 18.13 | 15.13          | 15.55 | 16.10 | 16.54 | 17.75 |
|                 | 8H   | 15.73            | 16.10 | 16.71 | 17.08 | 18.31 | 15.35          | 15.72 | 16.32 | 16.70 | 17.93 |
|                 | 12H  | 15.87            | 16.19 | 16.85 | 17.17 | 18.45 | 15.47          | 15.79 | 16.45 | 16.77 | 18.04 |
| 12H             | 4H   | 14.86            | 15.31 | 15.82 | 16.28 | 17.50 | 14.50          | 14.95 | 15.46 | 15.92 | 17.14 |
|                 | 6H   | 15.54            | 15.91 | 16.52 | 16.89 | 18.12 | 15.18          | 15.54 | 16.15 | 16.52 | 17.75 |
|                 | 8H   | 15.79            | 16.11 | 16.77 | 17.09 | 18.36 | 15.42          | 15.74 | 16.40 | 16.71 | 17.99 |