

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: P904994

Luminaire Tested: DFN2DIP-4P3F0-060D050US835-FLLFLL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P904994  
REPORT IS A COMBINATION OF REPORTS P899067 AND P895917  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-4P3F0-060D050US835-FLLFLL  
Description: 3 foot, 90deg - 4way Define Geo, with Direct Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

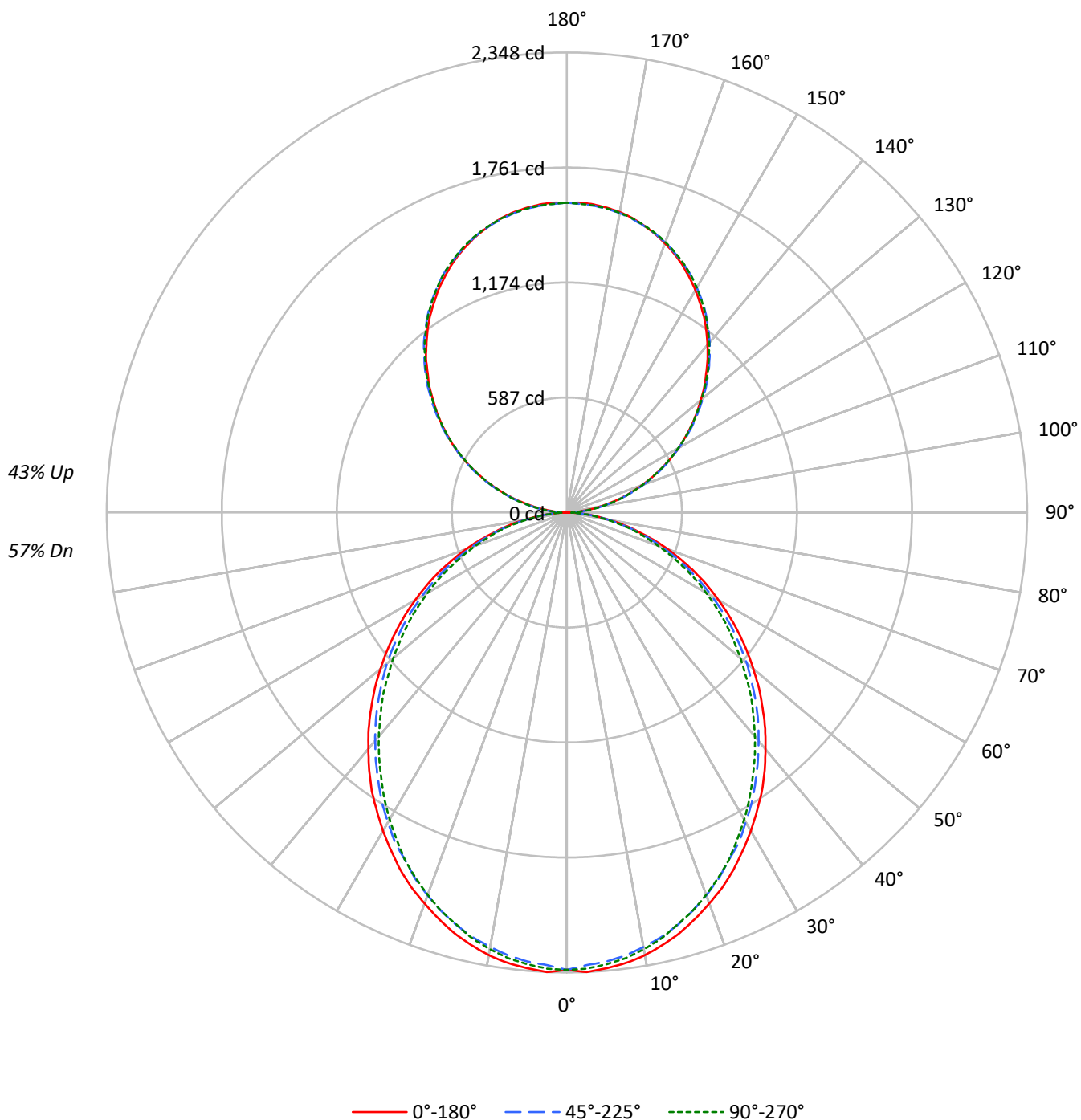
Lumens per Lamp: N/A  
Luminaire Lumens: 10365.0 lumens  
Efficiency: N/A  
Efficacy: 103.4 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 3.07' x L: 3.07' x H: 0.1')  
CIE Type: General Diffuse

Input Watts (W): 100.2  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9963  
Total Harmonic Distortion (THDi): 0.065  
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 | 75 | 75 | 75 | 63 | 63 | 63 |
| 1   | 99  | 95  | 91  | 88  | 92  | 89  | 85  | 82  | 77 | 74 | 72 | 66 | 64 | 62 | 56 | 54 | 53 |
| 2   | 91  | 83  | 77  | 72  | 84  | 78  | 72  | 67  | 67 | 63 | 60 | 58 | 55 | 52 | 49 | 47 | 45 |
| 3   | 83  | 73  | 66  | 60  | 77  | 68  | 62  | 56  | 59 | 54 | 50 | 51 | 47 | 44 | 43 | 41 | 38 |
| 4   | 76  | 65  | 57  | 51  | 70  | 61  | 53  | 48  | 53 | 47 | 43 | 46 | 41 | 38 | 39 | 36 | 33 |
| 5   | 69  | 58  | 49  | 43  | 64  | 54  | 47  | 41  | 47 | 41 | 37 | 41 | 36 | 33 | 35 | 31 | 29 |
| 6   | 64  | 52  | 44  | 38  | 59  | 49  | 41  | 36  | 43 | 37 | 32 | 37 | 32 | 29 | 32 | 28 | 25 |
| 7   | 59  | 47  | 39  | 33  | 55  | 44  | 37  | 32  | 39 | 33 | 28 | 34 | 29 | 25 | 29 | 25 | 22 |
| 8   | 55  | 43  | 35  | 29  | 51  | 40  | 33  | 28  | 35 | 29 | 25 | 31 | 26 | 23 | 27 | 23 | 20 |
| 9   | 51  | 39  | 31  | 26  | 48  | 37  | 30  | 25  | 32 | 27 | 23 | 28 | 24 | 20 | 25 | 21 | 18 |
| 10  | 48  | 36  | 28  | 24  | 45  | 34  | 27  | 23  | 30 | 24 | 21 | 26 | 22 | 19 | 23 | 19 | 17 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 2661 | 2661 | 2661 |
| 5°  | 2663 | 2622 | 2640 |
| 10° | 2640 | 2585 | 2604 |
| 15° | 2599 | 2540 | 2547 |
| 20° | 2545 | 2480 | 2489 |
| 25° | 2491 | 2407 | 2422 |
| 30° | 2424 | 2340 | 2337 |
| 35° | 2360 | 2260 | 2247 |
| 40° | 2282 | 2180 | 2162 |
| 45° | 2204 | 2099 | 2074 |
| 50° | 2119 | 2015 | 1973 |
| 55° | 2029 | 1917 | 1880 |
| 60° | 1928 | 1801 | 1773 |
| 65° | 1817 | 1681 | 1647 |
| 70° | 1675 | 1534 | 1511 |
| 75° | 1480 | 1358 | 1384 |
| 80° | 1244 | 1133 | 1144 |
| 85° | 876  | 751  | 749  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 2204 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 219.7   | 2.1       |
| 10°-20°   | 618.3   | 6.0       |
| 20°-30°   | 908.6   | 8.8       |
| 30°-40°   | 1055.3  | 10.2      |
| 40°-50°   | 1054.0  | 10.2      |
| 50°-60°   | 919.0   | 8.9       |
| 60°-70°   | 679.4   | 6.6       |
| 70°-80°   | 384.4   | 3.7       |
| 80°-90°   | 105.9   | 1.0       |
| 90°-100°  | 97.8    | 0.9       |
| 100°-110° | 310.9   | 3.0       |
| 110°-120° | 532.1   | 5.1       |
| 120°-130° | 699.7   | 6.8       |
| 130°-140° | 785.4   | 7.6       |
| 140°-150° | 770.2   | 7.4       |
| 150°-160° | 646.1   | 6.2       |
| 160°-170° | 428.5   | 4.1       |
| 170°-180° | 149.8   | 1.4       |
| <hr/>     |         |           |
| 0°-30°    | 1746.6  | 16.9      |
| 0°-40°    | 2801.8  | 27.0      |
| 0°-60°    | 4774.8  | 46.1      |
| 0°-90°    | 5944.5  | 57.4      |
| 90°-120°  | 940.8   | 9.1       |
| 90°-150°  | 3196.2  | 30.8      |
| 90°-180°  | 4421.0  | 42.7      |
| 0°-180°   | 10365.0 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 2335 | 2335  | 2335 | 2335  | 2335 |      |
| 5°   | 2335 | 2326  | 2301 | 2319  | 2315 | 222  |
| 15°  | 2222 | 2209  | 2180 | 2189  | 2178 | 626  |
| 25°  | 2011 | 1994  | 1955 | 1960  | 1955 | 926  |
| 35°  | 1735 | 1713  | 1677 | 1663  | 1652 | 1084 |
| 45°  | 1412 | 1396  | 1363 | 1338  | 1329 | 1090 |
| 55°  | 1069 | 1055  | 1028 | 1001  | 990  | 955  |
| 65°  | 721  | 707   | 685  | 664   | 653  | 713  |
| 75°  | 377  | 373   | 361  | 348   | 352  | 402  |
| 85°  | 92   | 90    | 88   | 81    | 79   | 103  |
| 90°  | 1    | 17    | 47   | 44    | 45   | 10   |
| 95°  | 70   | 83    | 85   | 85    | 83   | 77   |
| 105° | 287  | 291   | 294  | 296   | 296  | 303  |
| 115° | 534  | 542   | 539  | 538   | 534  | 528  |
| 125° | 777  | 788   | 785  | 780   | 779  | 694  |
| 135° | 1004 | 1019  | 1022 | 1021  | 1017 | 776  |
| 145° | 1220 | 1229  | 1237 | 1238  | 1233 | 762  |
| 155° | 1394 | 1398  | 1402 | 1409  | 1405 | 642  |
| 165° | 1517 | 1516  | 1516 | 1525  | 1518 | 428  |
| 175° | 1578 | 1575  | 1572 | 1581  | 1573 | 150  |
| 180° | 1581 | 1581  | 1581 | 1581  | 1581 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 2334.6 | 2334.6 | 2334.6 | 2334.6 | 2334.6 |
| 2.5°   | 2348.2 | 2337.0 | 2312.2 | 2334.6 | 2330.3 |
| 5°     | 2334.6 | 2325.8 | 2301.0 | 2318.9 | 2314.6 |
| 7.5°   | 2318.9 | 2305.6 | 2280.8 | 2298.9 | 2294.4 |
| 10°    | 2294.4 | 2278.7 | 2251.7 | 2269.6 | 2262.9 |
| 12.5°  | 2260.6 | 2247.2 | 2220.3 | 2231.5 | 2227.0 |
| 15°    | 2222.4 | 2209.1 | 2179.8 | 2188.9 | 2177.7 |
| 17.5°  | 2175.3 | 2162.0 | 2132.7 | 2143.8 | 2132.7 |
| 20°    | 2123.6 | 2110.3 | 2078.8 | 2085.5 | 2076.7 |
| 22.5°  | 2072.2 | 2051.9 | 2022.6 | 2022.6 | 2018.1 |
| 25°    | 2011.4 | 1993.6 | 1955.4 | 1959.7 | 1955.4 |
| 27.5°  | 1944.0 | 1928.3 | 1899.2 | 1892.6 | 1881.4 |
| 30°    | 1876.9 | 1858.7 | 1825.2 | 1818.5 | 1809.4 |
| 32.5°  | 1804.9 | 1791.6 | 1755.6 | 1742.0 | 1733.0 |
| 35°    | 1735.4 | 1713.0 | 1677.0 | 1663.4 | 1652.2 |
| 37.5°  | 1656.8 | 1636.5 | 1600.6 | 1584.8 | 1573.6 |
| 40°    | 1576.0 | 1557.9 | 1522.0 | 1502.0 | 1492.9 |
| 42.5°  | 1497.4 | 1479.3 | 1443.6 | 1421.0 | 1407.6 |
| 45°    | 1412.2 | 1396.4 | 1362.6 | 1338.1 | 1329.0 |
| 47.5°  | 1329.0 | 1313.3 | 1277.4 | 1252.6 | 1239.2 |
| 50°    | 1241.4 | 1230.2 | 1198.8 | 1167.3 | 1156.1 |
| 52.5°  | 1156.1 | 1140.4 | 1111.3 | 1086.6 | 1070.9 |
| 55°    | 1068.7 | 1055.1 | 1028.2 | 1001.3 | 990.1  |
| 57.5°  | 981.1  | 969.9  | 940.6  | 913.7  | 904.6  |
| 60°    | 893.4  | 884.6  | 853.2  | 828.4  | 821.7  |
| 62.5°  | 808.1  | 792.4  | 770.0  | 747.6  | 738.6  |
| 65°    | 720.7  | 707.2  | 684.8  | 664.5  | 653.3  |
| 67.5°  | 630.9  | 619.5  | 599.5  | 583.8  | 574.7  |
| 70°    | 547.8  | 538.8  | 518.5  | 502.8  | 494.0  |
| 72.5°  | 462.5  | 453.5  | 442.3  | 426.6  | 419.9  |
| 75°    | 377.0  | 372.8  | 361.3  | 348.0  | 352.5  |
| 77.5°  | 300.8  | 291.8  | 287.2  | 280.6  | 273.9  |
| 80°    | 224.6  | 222.2  | 217.7  | 211.0  | 206.5  |
| 82.5°  | 152.7  | 152.7  | 150.5  | 141.5  | 141.5  |
| 85°    | 91.9   | 89.8   | 87.6   | 80.7   | 78.6   |
| 87.5°  | 40.5   | 36.0   | 31.4   | 24.8   | 22.4   |
| 90°    | 1.4    | 17.2   | 46.7   | 43.9   | 45.3   |
| 92.5°  | 29.6   | 40.0   | 41.5   | 42.9   | 42.9   |
| 95°    | 69.6   | 83.0   | 85.3   | 85.3   | 83.0   |
| 97.5°  | 115.8  | 128.2  | 133.5  | 133.5  | 133.5  |
| 100°   | 169.2  | 180.2  | 184.0  | 184.0  | 182.6  |
| 102.5° | 225.5  | 233.6  | 238.8  | 240.3  | 238.8  |
| 105°   | 287.0  | 290.8  | 293.7  | 296.0  | 296.0  |
| 107.5° | 348.0  | 353.7  | 353.7  | 354.7  | 348.0  |
| 110°   | 407.1  | 414.8  | 414.8  | 414.8  | 410.9  |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 471.0  | 479.1  | 477.7  | 473.9  | 471.0  |
| 115°   | 533.9  | 541.6  | 539.2  | 537.8  | 533.9  |
| 117.5° | 596.4  | 606.9  | 600.2  | 596.4  | 592.6  |
| 120°   | 659.3  | 669.8  | 659.3  | 659.3  | 655.0  |
| 122.5° | 716.5  | 729.9  | 723.2  | 719.4  | 716.5  |
| 125°   | 776.6  | 788.5  | 784.7  | 780.4  | 779.0  |
| 127.5° | 835.2  | 850.0  | 844.8  | 839.0  | 835.2  |
| 130°   | 890.1  | 907.2  | 904.8  | 902.0  | 896.7  |
| 132.5° | 951.6  | 964.9  | 965.9  | 959.2  | 955.4  |
| 135°   | 1004.5 | 1019.2 | 1022.1 | 1020.7 | 1016.9 |
| 137.5° | 1063.6 | 1075.5 | 1077.9 | 1076.9 | 1071.2 |
| 140°   | 1115.5 | 1127.5 | 1134.1 | 1134.1 | 1128.9 |
| 142.5° | 1168.9 | 1180.9 | 1184.7 | 1186.1 | 1180.9 |
| 145°   | 1219.5 | 1229.0 | 1236.6 | 1238.1 | 1232.8 |
| 147.5° | 1264.8 | 1276.7 | 1282.4 | 1284.8 | 1279.5 |
| 150°   | 1311.5 | 1319.6 | 1324.8 | 1329.1 | 1324.8 |
| 152.5° | 1353.0 | 1361.1 | 1367.7 | 1373.0 | 1367.7 |
| 155°   | 1394.4 | 1398.2 | 1402.5 | 1409.2 | 1404.9 |
| 157.5° | 1430.2 | 1433.0 | 1435.4 | 1445.0 | 1438.3 |
| 160°   | 1462.1 | 1465.0 | 1466.4 | 1474.5 | 1468.8 |
| 162.5° | 1491.7 | 1491.7 | 1493.1 | 1502.2 | 1495.5 |
| 165°   | 1517.0 | 1515.5 | 1515.5 | 1525.1 | 1518.4 |
| 167.5° | 1539.8 | 1535.5 | 1535.5 | 1545.1 | 1538.4 |
| 170°   | 1557.0 | 1553.2 | 1551.8 | 1561.3 | 1553.2 |
| 172.5° | 1568.9 | 1565.1 | 1563.7 | 1573.2 | 1565.1 |
| 175°   | 1578.5 | 1574.6 | 1571.8 | 1581.3 | 1573.2 |
| 177.5° | 1583.7 | 1579.9 | 1577.0 | 1585.1 | 1577.0 |
| 180°   | 1581.3 | 1581.3 | 1581.3 | 1581.3 | 1581.3 |

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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 | 11.29            | 12.22 | 12.18 | 13.13 | 14.30 | 10.85          | 11.78 | 11.74 | 12.69 | 13.85 |
|                 | 3H   | 12.95            | 13.79 | 13.85 | 14.71 | 15.89 | 12.46          | 13.30 | 13.36 | 14.22 | 15.40 |
|                 | 4H   | 13.54            | 14.33 | 14.46 | 15.26 | 16.45 | 13.04          | 13.84 | 13.96 | 14.76 | 15.96 |
|                 | 6H   | 13.94            | 14.67 | 14.87 | 15.60 | 16.81 | 13.44          | 14.17 | 14.37 | 15.10 | 16.31 |
|                 | 8H   | 14.04            | 14.74 | 14.98 | 15.69 | 16.90 | 13.54          | 14.24 | 14.48 | 15.19 | 16.39 |
|                 | 12H  | 14.09            | 14.75 | 15.04 | 15.70 | 16.93 | 13.58          | 14.24 | 14.53 | 15.19 | 16.42 |
| 4H              | 2H   | 11.76            | 12.55 | 12.68 | 13.47 | 14.67 | 11.40          | 12.19 | 12.32 | 13.12 | 14.31 |
|                 | 3H   | 13.62            | 14.28 | 14.56 | 15.24 | 16.45 | 13.21          | 13.87 | 14.15 | 14.83 | 16.04 |
|                 | 4H   | 14.34            | 14.94 | 15.28 | 15.89 | 17.13 | 13.91          | 14.51 | 14.86 | 15.47 | 16.70 |
|                 | 6H   | 14.85            | 15.37 | 15.81 | 16.35 | 17.58 | 14.42          | 14.94 | 15.38 | 15.91 | 17.15 |
|                 | 8H   | 15.00            | 15.49 | 15.96 | 16.45 | 17.70 | 14.56          | 15.05 | 15.52 | 16.02 | 17.27 |
|                 | 12H  | 15.07            | 15.51 | 16.05 | 16.50 | 17.75 | 14.62          | 15.06 | 15.60 | 16.05 | 17.31 |
| 8H              | 4H   | 14.53            | 15.02 | 15.49 | 15.99 | 17.24 | 14.16          | 14.64 | 15.12 | 15.61 | 16.86 |
|                 | 6H   | 15.16            | 15.56 | 16.15 | 16.57 | 17.82 | 14.78          | 15.18 | 15.76 | 16.19 | 17.44 |
|                 | 8H   | 15.38            | 15.74 | 16.37 | 16.73 | 18.00 | 14.99          | 15.34 | 15.98 | 16.34 | 17.61 |
|                 | 12H  | 15.51            | 15.82 | 16.51 | 16.82 | 18.13 | 15.10          | 15.41 | 16.10 | 16.41 | 17.72 |
| 12H             | 4H   | 14.52            | 14.96 | 15.50 | 15.95 | 17.20 | 14.15          | 14.59 | 15.13 | 15.58 | 16.83 |
|                 | 6H   | 15.19            | 15.55 | 16.19 | 16.55 | 17.81 | 14.82          | 15.17 | 15.81 | 16.17 | 17.44 |
|                 | 8H   | 15.43            | 15.74 | 16.43 | 16.74 | 18.05 | 15.05          | 15.36 | 16.05 | 16.36 | 17.67 |